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AUTONOMOUS EXCHANGES: HUMAN-MACHINE AUTONOMY IN THE AUTOMATED MEDIA ECONOMY

by

CHRISTOPHER M. Cox

Under the Direction of Ethan Tussey

ABSTRACT

Contemporary discourses and representations of automation stress the impending “autonomy” of automated technologies. From pop culture depictions to corporate white papers, the notion of autonomous technologies tends to enliven dystopic fears about the threat to human autonomy or utopian potentials to help humans experience unrealized forms of autonomy. This project offers a more nuanced perspective, rejecting contemporary notions of automation as inevitably vanquishing or enhancing human autonomy. Through a discursive analysis of industrial “deep texts” that offer considerable insights into the material development of automated media technologies, I argue for contemporary automation to be understood as a field for the exchange of autonomy, a *human-machine autonomy* in which autonomy is exchanged as cultural and economic value. Human-machine autonomy is a shared condition among humans and intelligent machines shaped by economic, legal, and political paradigms with a stake in the cultural uses of automated media technologies. By understanding human-machine autonomy, this

project illuminates complications of autonomy emerging from interactions with automated media technologies across a range of cultural contexts.

INDEX WORDS: automation, autonomy, media, technology, industry, digital

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by

CHRISTOPHER M. COX

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1 INTRODUCTION

In late 2016, the popular reality show *Duck Dynasty* (2012 - 2017) premiered an episode entitled "Automation Frustration." In this episode, Willie (CEO of the Duck Commander company) buys a 3D printer in the hopes of enhancing in-house productivity of the company's duck calls. Willie introduces the printer to his small cadre of employees (who also happen to be part of his family) by describing it as a "co-worker" that will come to be their "best friend." A cutaway to Willie, however, reveals a more adversarial relationship. "I haven't even plugged it in and already it's my most productive employee," he says. Indeed, after his employees use the printer for prototyping throwing stars and wiffle balls, Willie describes to them the industrial sensibility of opting for more printers as a potential replacement for human labor, extolling the printer's ability to produce duck calls 24 hours per day. This is preferable to human labor since, as he tells them, humans can't work 24 hours per day and machines likewise do not play wiffle ball on the job or take time off work due to illnesses. The episode subsequently plays up the expandability of the Duck Commander employees due to the potential full automation of the duck-call-producing enterprise. Alongside this expandability is the fearfulness exhibited towards advanced automative technology, replete with suggestions from the employees that the machines will not only take their jobs, but ultimately become autonomous in the vein of terminator machines as depicted in the *Terminator* franchise of films. The employees decide to expend more energy on their labor output, promoting Willie in a cutaway scene to reveal that he intentionally played into their fears of advanced technology as a motivational technique.

"Automation Frustration" taps into a recurring theme coursing throughout cultural depictions: as technologies increasingly become capable of performing physical and intellectual tasks traditionally the purview of human beings, the dignity and social utility of humans decreases. This relationship is often posited as a negative correlation, one epitomized by "Automation Frustration." As machines increase their capabilities to perform tasks such as the physical rendering and replication of duck

calls, human dignity, laboring capacities, and social utility invariably decrease. Such tasks occur through a complex array of interlocked automated technologies and processes, such as artificial intelligence (AI), algorithms, machine learning, and other advanced computational processes that enable both knowledge-based and manual tasks to be performed by these automated techniques as a scale, speed, and efficiency in excess of human capability. In addition to the often incomprehensible nature of the techniques and processes constituting automation in the contemporary moment, the result is a tendency to posit automation as an escalation of machine prowess that forges an adversarial relationship between humans and machines, one in which humans must attempt to overcome, subdue, and gain mastery over technologies. Failing to do so places humans on the cusp of obsolescence, not only in terms of laboring agents but also - as posited in many cultural depictions - as the dominant life-form on earth. It is, in other words, humans versus machines, us versus them, machine prowess versus human dignity, a contemporary iteration of technological dystopian in which highly-automated technologies are pitted against humans in a zero-sum struggle for a critical condition of defining significance: autonomy.

1.1 Dystopias of Autonomous Technologies in Contemporary Culture

One of the primary fears addressed in “Automation Frustration” is the potential inability of these workers to enact a sense of choice, purpose, and fulfillment in their employment and productive tasks. More profoundly, however, the 3D printer threatens not only their employment but their autonomy, both as employed workers and as human beings striving for dignity through productive capacities. Autonomy, as traditionally conceived, is the ability to exercise and enact directive purpose free from coercion, restraint, or other impeding forces. It is a critical capacity for controlling and directing the circumstances of one’s own life, often conceived as the ability to self-determine and self-direct.

Where “Automation Frustration” depicts automated technologies as distinctly non-humanoid devices with sophisticated functions that threaten the autonomy of warehouse workers, other pop culture

tends to extrapolate from this sophistication to depict highly-intelligent synthetic (often humanoid) beings whose increasingly autonomous potential threatens the autonomy of humans as uniquely-intelligent life forms. These depictions are new iteration of a recurrent cycle of “autonomous technology,” a “belief that somehow technology has gotten out of control and follows its own course, independent of human direction.”¹ Autonomous technology is an ongoing cultural fear associated with the loss of human mastery over machines that tends to recur alongside impending technological disruption, often conceived as occurring through a break or rupture that divests autonomous potential from humans and transfers autonomy to machines controlling all facets of human life. From human mastery to machine masters, as the trope commonly goes.

In many depictions of autonomous technology, the threat of automation escalates from the potential displacement of warehouse workers to the offsetting of human autonomous potential at the hands of intelligent mechanical beings capable of exercising their own autonomy. In this way, contemporary culture is profuse with a dystopia of autonomous technology that dovetails with common dystopic themes while foregrounding and embodying artificial intelligence (AI), robots, and other autonomous technologies as the contemporary source of dystopic paradigms.

Technological dystopianism commonly appears as three narrative themes: hegemonic (a privileged group of people use technology to dominate and control others), apocalyptic (technology as a harbinger of unparalleled widespread doom), and satiric (technologies defy expectations in a manner that makes life worse or leads to undesirable outcomes).² Across all three narratives, dystopian fears emphasize a loss of control, overdependence, and inability to halt the change made manifest by technologies.³ Two

¹ Winner, Langdon. *Autonomous technology: Technics-out-of-control as a theme in political thought*. MIT Press (1978): 13.

² David Nye, “Technological Prediction: A Promethean Problem,” *Technological Visions: The Hopes and Fears that Shape New Technologies*, eds. Marita Sturken, Douglas Thomas, and Sandra Ball-Rokeach (Temple University Press, 2004): 171.

³ Nancy Baym, *Personal Connections in the Digital Age* (John Wiley & Sons: 2015): 28.

common scenarios represent a contemporary manifestation of these themes and fears in popular media, trade press, and futurist discourse (as well as their points of overlap). The first scenario – what I will refer to as the “robot overlord” motif – imagines advanced AI becoming autonomous from human control as it seeks to control humans through totalized domination of society. The second scenario – what I will refer to as the “job-stealing robot” motif – imagines the autonomous capabilities of advanced AI as being able to perform many (or most) formal job roles better than humans, thereby rapidly ushering in mass unemployment and destitution.

1.2 Contemporary Technological Dystopia: The Autonomous Robot Overlord

Based on recent developments, the horror and threat posed by the xenomorph creatures of the *Alien* media franchise now primarily belongs to an aspirant robot overlord that is the focus of recent *Alien* film prequels. Recent additions to the *Alien* film franchise focus more on the dangers from non-human robotic autonomy than the non-human threat of the titular alien creatures. The android character David 8 introduced in *Prometheus* (2012) is as a servile creation designed to follow the directions of human counterparts. Over the course of *Prometheus* and the follow-up *Alien: Covenant* (2017), David 8 first undermines his human teammates at the behest of surrogate father (and corporate scion) Peter Wyland as part of an effort to identify and understand humanity’s creators and, upon the death of Wyland, breaks from human servility and ultimately uses human bodies as a means of progenerating the Alien creatures. While manipulative androids figured into the first *Alien* film and its three sequels, *Prometheus* and *Alien: Covenant* shifts the primary antagonistic threat from the alien creatures to David 8 and his fascination with the alien creatures as forms of life superior to human beings. The more autonomous David 8 becomes, the grander and more severe his threat to all human life, notably since an early scene in *Alien:*

Covenant makes it clear that David 8 interprets human biological infinitude as evidence of human inferiority when compared to the hypothetical infinitude⁴ of androids and the superior biological prowess of the alien creatures.

The popular superhero franchise *The Avengers* features its own recent take on the robotic overlord motif. In *The Avengers* (2012), the film continues a trend introduced in the *Iron Man* film series counterpart of the Marvel Cinematic Universe: the depiction of J.A.R.V.I.S. (an acronym for “Just Another Rather Very Intelligent System”) as an advanced artificial intelligence. This depiction is a turn from the human “Jarvis” who initially appeared in Marvel Comics books in 1964 and continually appeared as a human being in Marvel Comics media until the introduction of J.A.R.V.I.S. in *Iron Man* (2008). Where the robotic replacement of a human being in *The Avengers* epitomizes dystopian notions of job-stealing robots, its sequel *The Avengers: Age of Ultron* (2015) advances dystopian themes through the depiction of a sentient AI intent on destroying all human life. In this film, the titular Ultron is initially a program designed by Tony Stark to assist with global peace-keeping. Upon gaining sentience, Ultron quickly decides humans are earth’s greatest threat and therefore must be rendered extinct.

Ultron’s sentience occurs as a flashpoint moment when Tony Stark uses a cosmic “gem” with quasi-magical powers to finalize the Ultron’s code. Alighted by human-like sentience through this gem, the flashpoint moment transforming Ultron from a highly-intelligence computer to a sentient being allegorizes the concept of the technological singularity (alternately: the singularity). First posited by computer scientist Vernor Vinge⁵ and popularized⁶ by futurist Ray Kurzweil, the singularity conceives of technologi-

⁴ The name “David 8” is a nod to this notion of infinite life, as “8” is not only the numeric number “eight” but a 90-degree rotation of a horizontal mobius strip often used to indicate “infinity.”

⁵ Vinge coined the term “technological singularity” and outlined its components in a 1993 essay. See: Vernor Vinge, “The Coming Technological Singularity,” *Whole Earth Review* 81 (1993): 88-95.

⁶ In addition to Kurzweil’s titular book on the singularity, two documentaries have been made about Kurzweil and the singularity: *The Transcendent Man* (2005) and *The Singularity Is Near* (2012) (directed by Kurzweil). He has also discussed his ideas in many other documentaries and television programs such as *The Daily Show* (1999-2015),

cal autonomy as a conditioned accelerated by rapid emergence of sentience, as when these technologies attain the analytic, emotional, moral, and intellectual prowess associated with the human brain, they will achieve full autonomy by breaking from human dominance and determining courses of action based on their independent purposive will. Many dystopic robot overlords, such as Ultron, embody autonomous potential via a flashpoint moment transitioning synthetic intelligence to a sentient state emblematic of human capacities for intelligence and autonomy. The significance of the singularity for autonomous technology, however, extends beyond its influence on pop culture narratives. Where Vinge and Kurzweil postulate the theory of the singularity based on real-world technological design, progress, and theorems (such as Moore's Law⁷), other non-fiction writers have followed suit to stress dystopic implications for humankind predicated on material developments in automated prowess.

Notably, James Barrat's *Our Final Invention: Artificial Intelligence and the End of the Human Era* (2013) seeks to explore the consequences of a potential near-future world in which critical societal decision-making is the exclusive purview of increasingly autonomous technologies capable of rapid, efficient, and error-free decision-making. To Barrat's mind, this world is a "computer hegemony" predicated on a technological sophistication "advanced enough to act with human-level intelligence" and therefore "unpredictable and inscrutable all of the time."⁸ Evoking the hegemonic theme of dystopian narratives and

The Colbert Report (2005-2014), and *Real Time with Bill Maher* (2003 – present). Moreover, in September 2008, Kurzweil co-founded the think tank Singularity University.

⁷ Briefly stated, Moore's law posits increases in computer processing speed, power, and efficiency that grow with exponential magnitude over short-term and longer-term intervals (i.e. doubling of speed every two years over a period of 30 years).

⁸ James Barrat, *Our Final Invention: Artificial Intelligence and the End of the Human Era* (Thomas Dunne Books: 2013), 4.

Antonio Gramsci's notion of culturally-hegemonic "intellectuals" striving to be conceived as "autonomous and independent from the dominant social group,"⁹ Barrat similarly conceives of intelligent computers as autonomous and independent from human beings and the ability of humans to ascertain the motivations and machinations of these robotic overlords.

In addition to the robot overlord motif, the dystopic conception of job-stealing robots appears prominently in cultural discourses. Unlike the robot overlord motif, the notion of job-stealing robots manifests most prominently among business trade texts, economic forecasting, and policy reportage.

1.3 Contemporary Technological Dystopia: The Autonomous Job-Stealing Robot

Recent books such as *Rise of the Robots: Technology and the Threat of a Jobless Future* (2013), *The Glass Cage: Automation and Us* (2014)¹⁰, *The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies* (2014), *Humans Need Not Apply: A Guide to Wealth and Work in the Age of Artificial Intelligence* (2015) are just a handful of recent popular press tomes that situate technological autonomy as a breakpoint for the mass displacement of employment opportunities for all types of labor, including jobs predicated on the performance of human cognitive tasks once believed impossible to replicate with automated sophistication. Notably, Martin Ford's *Rise of the Robots* describes the consequences of an "automation wave" as the mass disruption and displacement of workers permanently excised from the labor market as industries scale up automated work processes while scaling down human workforces.¹¹

While less alarming in their rhetoric, even the measured intonations of think-tank white papers and reports often posit automated innovation as a force acting in direct opposition to human vitality. The

⁹ Antonio Gramsci, "The Revolutionary Intellectual," in *An Anthology of Western Marxism*, ed. Roger S. Gottlieb (Oxford University Press: 1989): 113.

¹⁰ While "Automation and Us" was the original hardcover subtitle, this changed to "How Our Computers Are Changing Us" for the paperback version.

¹¹ Ford, Martin. *Rise of the Robots: Technology and the Threat of a Jobless Future*. Basic Books (2015): 1-28.

McKinsey Institute's 2017 report "A Future that Works: Automation, Employment, and Productivity" stresses the potential for automation to positively impact productivity and financial ledgers for private enterprises, since computers are increasingly capable of "making tacit judgments" and "sensing emotion" on par with humans while requiring no leisure or sick time or expenditures for health care or related expenses.¹²

Likewise, the central premise of a March 2017 working paper from the National Bureau for Economic Research (NBER) posits labor as a field of contestation between human and robotic workers.¹³ Broadly speaking, this report suggests that the integration of automated capacities reduces employment and wage opportunities for humans in a geographically approximate zone. It further elaborates on the distinctive impact of automation on employment and wages compared to off-shoring, importation, and other economic and industrial variables.

A 2013 Oxford University study also estimated 47 percent of all U.S. jobs were at risk due to automation over the same amount of time (two decades).¹⁴ Widely-cited by trade press, think tanks, and academic scholarship,¹⁵ the Oxford 47 percent statistic appears so frequently by both proponents and detractors of dystopian orientations around automated job loss that it has practically become a talking point among journalists and policy works, even as this estimated proportionality subsequently received a measure of validation from the White House.

In Dec. 2016, the Executive Office of the President released *Artificial Intelligence, Automation, and the Economy*, an economic report attempting a sober analysis of "the effects of AI-driven automation on

¹² McKinsey Global Institute, "Harnessing Automation for a Future that Works." Jan. 2017. <http://www.mckinsey.com/global-themes/digital-disruption/harnessing-automation-for-a-future-that-works>

¹³ Acemoglu, Daron, and Pascual Restrepo. "Robots and jobs: Evidence from US labor markets." (2017). <http://www.sipotra.it/wp-content/uploads/2017/04/Robots-and-Jobs-Evidence-from-US-Labor-Markets.pdf>

¹⁴ Carl Benedikt Frey and Michael A. Osborne, "The Future of Employment: How Susceptible Are Jobs to Computerisation?," Sep. 17, 2013, https://www.oxfordmartin.ox.ac.uk/downloads/academic/The_Future_of_Employment.pdf.

¹⁵ As of early 2018, Google Scholar notes over 1,800 citations among academic literatures, in addition to its wide circulation among trade press, institutional blogs, and industry reports.

the U.S. job market and economy” in addition to recommending policy responses.¹⁶ One of its chief findings estimates the range of jobs potentially lost due to automation over the next two decades, cited as anywhere from 9 percent to 47 percent.¹⁷ Giving context to this range, the report notes that jobs displaced by automation tend to be those performed by “lower-paid, lower-skilled, and less-educated workers.”¹⁸ Despite the report’s measured claims, journalistic reportage tended to stress the upper limit of this range, aligning the report’s findings with the Oxford 47 percent statistic via headlines such as “The Long-Term Jobs Killer Is Not China. It’s Automation.”¹⁹ and “White House Warns of AI Making Swaths of Jobs Redundant”²⁰ leaning into (if not outright capitulating to) dystopian notions of job-stealing robots. Dystopic conceptions of autonomous technologies as hegemonic overlords and job-stealing interlopers ultimately gained enough visibility and traction that common knowledge of these motifs and the grandiosity of their claims led both tech industry magnates and Marxist-oriented theorists to assert their utopian potentials if the underlying determinants can be properly harnessed. One on hand, the technology industry downplayed the dystopic character of autonomous technologies to stress job creation and enhanced human productive intellect, even as Marxist theorists envisioned totalized automation as the gearwork for a fully-automated life beyond capitalism. Thus, from the twin motifs of autonomous technologies as robot overlords and job-stealing robots, a political economy of dystopic technological autonomy emerges.

¹⁶ Executive Office of the President, *Artificial Intelligence, Automation, and the Economy*, Dec. 20, 2016, <https://www.whitehouse.gov/sites/whitehouse.gov/files/images/EMBARGOED%20AI%20Economy%20Report.pdf>.

¹⁷ Ibid

¹⁸ Ibid

¹⁹ Claire Cain Miller, “The Long-Term Jobs Killer Is Not China. It’s Automation.,” *The New York Times*, Dec. 21, 2016, <https://www.nytimes.com/2016/12/21/upshot/the-long-term-jobs-killer-is-not-china-its-automation.html>.

²⁰ Anthony Cuthbertson, “White House Warns of AI Making Swaths of Jobs Redundant,” *Newsweek*, Dec. 22, 2016, <http://www.newsweek.com/artificial-intelligence-white-house-ai-inequality-disparity-535093>.

1.4 Downplaying Dystopia: Enterprise Opportunities in Automated Economies

A tendency among business enterprise leverages the job-stealing robot motif and the potential scale of labor market disruption to offer economic solutions for withstanding marketplace tumult. In many cases, these narratives follow a similar arc: acknowledging cultural fears of automation and autonomous technology, citing the potential material reality of an “automation wave,” and reassuring market sectors that disruptive turbulence can be minimized through sound business and economic recalibration. In other words, these narratives tend to downplay dystopia by playing up economic opportunities to capitalize on socio-economic circumstances surrounding automation. *In Humans Need Not Apply*, Jerry Kaplan offers the concept of a “job mortgage” as a “modernized free-market version of the historical apprenticeship or internship model” in which a worker secures the sponsorship of a potential employer who agrees – on good faith - to hire that worker in the intermediate future based on a projected need for that worker’s particular skills. In the context of automated worker displacement, a shift from liberal arts collegiate education to vocational training would enable skills-based training to be more closely aligned with unstaffed non-automated jobs, thereby making the job mortgage a viable prospect, especially for employers who can reap the benefits of a “self-regulating” system requiring no government intervention in the form of accreditation.²¹ In this scenario, the cultural fear of autonomous technologies is resolved by the institutional autonomy of businesses with greater latitude to staff non-automated jobs via hypothetical future employment to which the employer is only theoretically obligated.

Klaus Schwab, founder and chairman of the World Economic Forum, is also apt to downplay dystopia. Schwab is the chief proponent for the “fourth industrial revolution,” his term for the emergence of increasingly autonomous technologies across all facets of existence. In his book *The Fourth Industrial Revolution* (2017) and other writings, Schwab notes the potential vast disruption of labor markets and industrial sectors, while also stressing the opportunity presented by a world enlivened by autonomous

²¹ Ibid 155.

technologies, such as global connectivity and drastic improvements in organizational efficiency. The pitfalls of mass disruption to labor and economic markets, as well as the social inequality stemming from the hollowing out of such markets, can be alleviated by businesses and governments collaborating “across geographies, sectors and disciplines to grasp the opportunities it presents,” and by paying heed (and dollars) to “ideas, insights and wisdom from the World Economic Forum’s global network of top leaders from business, government and civil society and young leaders.”²²

Beyond macro-economic assessments and futurist forecasting, downplaying dystopia is a marketing tactic for companies developing automated technologies, especially AI. For IBM CEO Ginny Rometty, speaking to “robot takeovers” and “job stealers” is a necessary strategy to ensure the maintenance and maximization of IBM’s business model, company esteem, and opportunities for third-party collaborations with Watson, the company’s AI business-to-business (B2B) platform. When Rometty seizes an opportunity at the World Economic Forum to explain to a room of business and political leaders that AI “won’t prompt a robot takeover” as reported under the headline “At Davos, IBM CEO Ginny Rometty Downplays Fears of a Robot Takeover”²³ her strategy is twofold: disassociate Watson (and AI more generally) with hostile robotic takeovers of both human life and employability. In these circumstances, Rometty attempts a discursive tight-rope as she must tout the vast sophistication of Watson while rebuking the possibilities of a robot takeover and “fears that the technology will displace human workers entirely.”²⁴ Chapter 3 illuminates the complications of worker and corporate autonomy among IBM’s discursive strategies around Watson. This next section, however, outlines the other side of the coin for the political economy of downplaying dystopias around automation and autonomous technologies. Just

²² “The Fourth Industrial Revolution, by Klaus Schwab,” <https://www.weforum.org/about/the-fourth-industrial-revolution-by-klaus-schwab>.

²³ Claire Zillman, “At Davos, IBM CEO Ginni Rometty Downplays Fears of a Robot Takeover,” *Fortune*, Jan. 18, 2017, <http://fortune.com/2017/01/18/ibm-ceo-ginni-rometty-ai-davos/>.

²⁴ *Ibid.*

as business analysts and magnates stress the marketplace opportunities arising out of full automation, Marxian theorists envision totalized automation as the foundations for a post-capitalist social solidarity.

1.5 Downplaying Dystopia: A Fully-Automated Workers' Utopia

In his recent book *The Automatic Society: The Future of Work* (2017), philosopher Bernard Stiegler conceives of a full automation as the grounds for “dis-automization,” a process of collectivizing the totalized digital infrastructure constituting automation and asserting, invigorating, and realizing a knowledge of social solidarity and organization that resists the production and commodification of “intelligence” in contemporary automated capitalism. To his mind, full automation and the “knowledge” it produces can be seized to establish socio-economic life beyond capitalism. As an interpretive framework for contemplating life after capitalism, “postcapitalism” correlates similar notions around full automation and the possibilities for renewed economic flows to alleviate inequalities of wealth and labor expenditures.

The cover to Nick Srnicek and Alex Williams' *Inventing the Future: Postcapitalism and a World Without Work* (2015) succinctly summarizes how to realize this world: “demand full automation,” “demand universal basic income,” “demand the future.”²⁵ Srnicek and Williams argue for a post-work, post-capitalist society emerging from our interrelated demands: full automation, a reduced working week, apportioning of a basic income, and undermining the capitalist work ethic.²⁶ Automation, for these authors, does not *steal* or *take* jobs but instead can *alleviate* humans from the burden of work, so long as wealth redistribution and other non-capitalist economic frameworks are in place. Implicitly, the job-stealing robot motif is reworked for utopian ends. Robots won't steal your job; they'll help create the conditions for liberation. Srnicek and Williams' insistence on demanding for basic income (also known as “universal

²⁵ Srnicek, Nick, and Alex Williams. *Inventing the future: Postcapitalism and a world without work*. Verso Books, 2015.

²⁶ Ibid 127.

basic income”) corresponds to a wider call for such economic principles, especially one that can bring social equilibrium to a fully-automated world.

A basic income is money provisioned and apportioned by the state to all applicable recipients free from obligation to remuneration or indebtedness. It is, quite literally, a recurring lump payment from the state. A universal basic income (UBI), as the name implies, is the universal application of a basic income – applicable recipients are all existing human beings. In addition to a veritable cottage industry of popular press books arguing the merits of universal basic income in the context of fully-automated encroachment,²⁷ advocates for basic income also emanate from industrial sectors that produce increasingly autonomous technologies. Just as IBM CEO Ginny Rometty downplays dystopia for the sake of her company’s economic advantage, Elon Musk - as the CEO of a company developing autonomous vehicles – is economically incentivized to urge UBI as a protective gauge against job-eradicating dystopias.

Citing the impending reality of robots capable of performing most jobs better than humans, Tesla CEO Musk describes UBI as a “necessary” measure to offset the potential polarity of wealth inequality caused by automation’s ability to generate an abundance of wealth that is vested in small class of elite entrepreneurs controlling the automated means of production.²⁸ Similarly, despite his admonition that global economic circumstances do not yet warrant the implementation of UBI and a preference for income tax accreditation, Bill Gates believes the U.S. and other countries will eventually generate enough wealth capable of producing little or no hard when redistributed as a UBI or similar form. Post-capitalism arguments for full automation and redistributed wealth also orient back towards communist imaginaries, as “fully-automated luxury communism (FALC)” proposes a realization of communist aims free

²⁷ See: Stern, Andy. *Raising the floor: How a universal basic income can renew our economy and rebuild the American dream*. Public Affairs, 2016; Bregman, Rutger. *Utopia for Realists: And How We Can Get There*. Bloomsbury Publishing, 2017; Van Parijs, Philippe, and Yannick Vanderborght. *Basic income: A radical proposal for a free society and a sane economy*. Harvard University Press, 2017; Mason, Paul. *Postcapitalism: A guide to our future*. Macmillan, 2016.

²⁸ Chris Weller, “Elon Musk doubles down on universal basic income: ‘it’s going to be necessary,’” *Business Insider*, Feb. 13, 2017, <http://www.businessinsider.com/elon-musk-universal-basic-income-2017-2>.

from the impulses of its 20th century failures in conjunction with consumer accoutrements of capitalism. Beyond a nominal working week and basic income, FALC could provide free and equal access to housing education, healthcare, and even non-essential services and goods, engendering a “cybernetic meadow, tended to by machines of loving grace” that realizes a Marxian productive paradise.²⁹

1.6 Beyond Human *and* Machine Autonomy: Human-Machine Autonomy

Thus, as automated technologies increasingly encompass autonomous possibilities, cultural narratives tend to posit pendulum-like swings. Autonomous technologies are potentialized robot overlords or job-stealing robots of dystopic proportions. The widespread recognition of these dystopias is also the grounds for differing strands of utopian thinking. On one hand, the overdetermination of dystopic automation is the backdrop against which business analysts and corporate scions stress the unique qualities of their respective market sectors, companies, goods, and services as uniquely capable of leveraging automation for economic gains of workers and producers alike. On the other hand, rather than an opportunity for capitalist marketplace supremacy, full automation is the concomitant grounds for a post-capitalist world of significantly-reduced work, redistributed wealth, and a foothold for establishing socio-economic transcendence (i.e. fully-automated luxury communism). Between utopic and dystopic poles subsuming technological, economic, legal, and political paradigms, two prominent interpretations emerge. As automated technologies escalate towards autonomy, human autonomy is either repressed in diametrical contrast or enlivened in tandem with ascendant technological autonomy. In other words, human autonomy is either snuffed out or achieves unparalleled heights. While these narratives provide welcome imaginings, and provoke considerations of alternative uses for automated technologies to refresh socio-economic conditions, such thinking does not account for nuances of autonomy as a shared variable condition among humans and highly-automated technologies. Likewise, these conceptions are

²⁹ Brian Merchant, “Fully automated luxury communism,” The Guardian, Mar. 18, 2015, <https://www.theguardian.com/sustainable-business/2015/mar/18/fully-automated-luxury-communism-robots-employment>.

primarily the product of either industrial power brokers with an economic stake in promulgating ideas favorable to corporate bottom lines or theorists approaching industrial machinations as a predominantly philosophical condition.

To more precisely account for the cultural stakes of a world alighted by automation, I argue for *human-machine autonomy*, defined as *a field for the exchange of autonomy between humans and intelligent machines*. As I will demonstrate, human-machine autonomy resists purely dystopic or utopian conceptions of human autonomy as positively or negatively correlated towards a heretofore unrealized vista of technological autonomy. Instead, human-machine autonomy is the ebbing and flowing, waxing and waning, heightening and diminishing of autonomy that courses among encounters between humans and highly-automated technologies. It is an exchange of economic and cultural values, as technology companies develop autonomous technologies amidst material economic realities and imagine their cultural uses in corporate and marketplace motivations. Human-machine autonomy also pulls from a conception of autonomy that supersedes notions of individualistic pursuit or determinative potential couched in a singular vessel (such as a human mind or technological apparatus). Extending beyond self-determination, autonomy is an analytical and actionable prowess for assessing conditions governing an environment, determining potential courses of action, and carrying out willful actions indicative of such circumstances. While for autonomous vehicles the conditions of an environment might include road conditions transformed into datafied units through sensing technology, for humans such conditions include economic, legal, and other social paradigms constituting the possible parameters by which assessing, determining, and carrying out is conceived as possible and realizable.

Humans, as rational beings attempting to make informed decisions regarding how they will enact their will, must make judgments about the potential benefits, drawbacks, and consequences of their action in relation to a plethora of social phenomenon. My ability to rob a convenience store and avail my-

self to its wares is not restricted by an ever-present entity physically restraining me from taking this action. Instead, I am likely reluctant to rob the store because I have weighed my actions (both as social consequence and individual benefit) against laws that prohibit this action, institutions that will reprimand me if I carry out this action, and the dignity I will lose as a result of committing an asocial act, to say nothing of other avenues I may pursue as alternatives to the perceived gains of robbing the store (such as paying for the goods).

In this sense, humans often gauge the exercise of autonomy against societal norms and frameworks, be it laws that restrict robbery or social mores that designate robbery an immoral act (except, perhaps, under extenuating circumstances). These forces, then, should not necessarily be considered an imposition against the enactment of autonomy, but circumstances that shape *how* determinations can be made about ways to direct one's will and therefore potentially maximize their autonomy (and, for that matter, how to conceive of autonomy).

Just as humans experience (and are bound up in) phenomena that influence determinations about their course of actions, automated technologies are likewise situated amongst a series of phenomena informing decisions about possible and realizable actions. In this sense, human-machine autonomy is a field that both shapes - and is shaped by - economic, political, and social informants. Likewise, autonomous technologies allegorize and analogize cultural conditions inflecting upon the ability for humans to experience and enact autonomy, especially as these technologies penetrate contexts with established cultural practices bound up with presiding power constructs. In arguing for human-machine autonomy as the most viable means of understanding the cultural significance of automated technologies, my approach draws from industrial discourse to illuminate ideologies and complications of autonomy suffusing the development, proliferation, and uptake of such technologies.

1.7 Methodology: Discourse and Industrial Ideologies of Autonomy

Human-machine autonomy arises out of industrial discourse illuminating multifaceted conceptions of autonomy and the embeddedness of such conceptions amidst the production, governance, marketing, and cultural penetration of automated technologies. In conceptualizing human-machine autonomy, my analysis focuses on “deep texts,” a term John Caldwell uses to describe texts that emanate from industrial practitioners and institutions, indicate a shared source of meaning and practice, and illuminate “a constant churn of critical and theoretical ideas” incorporated into industrial outputs that maintain as these outputs enter avenues of cultural life.³⁰ As a “social force” that permeates all facets of life in contemporary society,³¹ industry’s critical and theoretical ideas imbue durable meanings and associations on the products and services at the heart of their productive undertaking. In this way, deep texts offer a wellspring of insights into industrial ideologies shaping not only the development of automated technologies, but the persistence of industrial ideologies in milieus at a remove from industry itself. My interest in deep texts, however, is less concerned with the content contained within a single deep text and more concerned with a deep text as a significant “nodal point” within a broader network of relevant discourse branching off from this text. In other words, autonomy emerges from discourse analyses of deep texts and other texts constituting an interlocked pattern of rhetorical significance.

A “nodal point,” as described by Laclau and Moueffe, is a privileged site among a broader network of discursive formations.³² Assessing discursive nodal points pulls loose threads to unravel the complexities of autonomy emerging from the meshwork of industrial practice, especially when “autonomy” is used implicitly as opposed to otherwise explicit applications of “autonomy” afforded to highly-auto-

³⁰ Caldwell, John. "Cultural studies of media production: Critical industrial practices." *Questions of method in cultural studies*(2006): 145.

³¹ Govil, Nitin. "Recognizing" industry," *Cinema Journal* 52.3 (2013): 172.

³² Ernesto Laclau, and Chantal Mouffe, *Hegemony and Socialist strategy: Towards a Radical Democratic Politics*, (Verso Books, 1985): 112.

mated technologies (i.e. autonomous vehicles). Discursively, “autonomy” is symptomatic of how industry conceives of highly-automated technologies as conceptualizing, allegorizing, and defining conditions for human beings in the context of industry’s imagined uses for such technologies. A symptomatic reading “divulges the undivulged,”³³ revealing “autonomy” as a critical force among significant discursive networks despite the relative infrequency of its literal appearance in textual practice. In this way, my approach exemplifies “thick description,” an “intellectual effort” and “elaborate venture” that supersedes instrumental approaches to discourse analysis to assess “meaningful structures” that shape the way discourse is produced, perceived and interpreted.³⁴

In addition to extended networks of meaningfully-structured discourse, my approach also extends the notion of a “deep text” to include texts that do not necessarily emanate from industrial actors and institutions yet nonetheless constitute significant nodes of industrial discourse. In the case of this project, I situate formal policy and regulatory texts as deep texts, notably since industrial practice and meaning-making transpire in close contact with policymaking and regulator schemas, influence legal provisions and recommendations, and incorporate anticipated ideologies and political beliefs of presiding policymaking bodies. Formal policy and regulation incorporate, govern, and influence industrial business models, corporate priorities, cross-sector collaboration, and productive capacities, often realized as mutually-reinforcing policy and industrial aims. In other words, policy and regulatory texts are both governing structures and discursive structures, constituting critical nodes in networks of discourse accounting for co-constituted political and economic realities, particularly as corridors of legal and corporate power tend to entail close contact. Chapters 1 and 2 (see more below) situate policy texts as critical nodal points for illuminating nuanced conceptions of autonomy (and for whom such conceptions are beneficial) among interlinked practices of industry and policymakers. In these chapters, my approach

³³ Althusser, Louis, et. al. *Reading Capital*. New Left Books (1970): 28.

³⁴ Geertz, Clifford. *The interpretation of cultures*. Basic books (1973): 6-7.

intervenes in critical policy studies literatures that add levity to my approach as I seek to address aspects unaccounted for in such literatures.

Across all chapters, however, I add levity to my approach by leveraging digital media theory and related theoretical frameworks to contextualize and clarify the relevancy of pertinent discourse. By engaging with digital media theory, the relationship between industry's conceptual notions of autonomy and implications for cultural life are more precisely and clearly rendered, especially given the viability of digital media theory to analogically or allegorically align digital media logics, affordances, interactions, and materialities with conditions of lived reality, imparting precise implications for industrial conceptions of autonomy on lived reality and the ways industry attempts to account for the uses and viability of automated technologies in cultural paradigms. Furthermore, while I draw from software studies, convergence theory, interface theory, and other sub-sectors of digital media theory, my approach also demands intervention with histories and philosophies of media technologies critical to placing discourse around contemporary automated technologies in appropriate contexts. In this way, I draw from television studies, technology studies, media historiography, and other adjacent fields to identify the ways contemporary ideologies of autonomy stemming from the development of automated technologies collide and repel with preceding socio-economic modes of integrating emerging technologies into presiding cultural domains. In this project, discourse analysis opens up avenues of insights deepened, contextualized, and qualified by appropriate theoretical application. In other words, discourse analysis excavates and preserves important tombs; theory decodes its hieroglyphics. This two-pronged approach – discourse analysis and theoretical application – is necessary to illuminate the breadth, scope, and significance of automated media as a field for the exchange of autonomy. In each chapter, I precisely account for the particular theoretical frameworks with which I engage and intervene. With that in mind, it's also important to clarify the parameters of "contemporary" automation at play in this project and how this contemporary moment fits into histories of automation as a concern for media scholarship and culture

at large. Thus, the next section provides a brief history of automation. This history is necessary for two primary reasons. First, it lays the groundwork for clarifying distinctions between contemporary automation and its 20th century antecedents. Second, this history accounts for critical media studies scholarship addressing automation over the course of this timeline, thereby clarifying how my project addresses gaps unresolved by this scholarship. Subsequent to this history, I clarify the time period under scrutiny at the heart of this “contemporary” moment and the significance of this time period, setting the stage for chapter summaries that include critical moments corresponding to this timeframe.

1.8 A Brief History of Automation: 1946 – Present

This current moment of automation is preceded by modalities of automated conditions and interrelated socio-economic conditions stretching back to the immediate post-WWII era of the 20th century. As David Nye notes in his monograph on the American assembly line, the term "automation" gained traction after a 1946 *Fortune* magazine story "The Automatic Factory." In 1948, the trade magazine *American Machinist* defined "automation" as

"the art of applying mechanical devices to manipulate work pieces into and out of equipment, turn parts between operations, remove scrap, and perform these tasks in times sequences with the production equipment so that the line can be put wholly or partially under pushbutton control at strategic stations."³⁵

Nearly 10 years later, writers and researchers described both the instrumental character of automation and its aims and outcomes.³⁶ With regard to its instrumentality, Friedrich Pollock understood automation to be "the use of certain methods of automatically producing and preparing goods; of producing information; and of making calculations...methods which are characteristic of our present stage of

³⁵ Nye, David E. *America's Assembly Line*. MIT Press (2013): 159 [quoted in].

³⁶ Diebold, John. *Automation: The advent of the automatic factory*. van Nostrand, 1952; Strehl, Rolf. *The Robots Are Among Us*. Acro Publishers, 1955.

technical development.³⁷ Its aims and outcomes, on the other hand, were to "replace men by machines in operating and directing machines as well as in controlling the output of the products that are being manufactured."³⁸ The reference to information and calculation is important, as in the decade-long interval between the definitions of *American Machinist* and Pollack, automation transitioned from a framework for describing uniform control of factory assembly procedures to a broader conception of automation as a feedback mechanism that also produces and leverages information as a means of standardizing work procedures and outcomes.

As conceptual notions of automation integrated informational production and outcomes alongside tangible factory procedures and goods, concerns around automation's implications for labor (and therefore economic and social life) became more prominent during the "automation crisis" of the 1960s. Broadly speaking, this "crisis" was characterized by social anxieties around the escalating prowess of automated technologies to perform tasks once deemed the natural purview of human beings, anxieties particularly potent among workers fearful of losing their job and future employment prospects.

While this "crisis" gained some traction in popular press, others were more sanguine about the effects of automation, given a mid-century belief in the ability of the U.S.'s burgeoning economic and governmental enterprises to "manage the future."³⁹ Lyndon B. Johnson indicated as much in 1964 when, remarking on the formation of the National Commission on Technology, Automation, and Economic Progress, he insisted that "automation is not our enemy" and instead held the potential to be "the ally of our prosperity if we will just look ahead, if we will understand what is to come, and if we will set our

³⁷ Pollock, Friedrich. *The economic and social consequences of automation*. Blackwell (1957): 5.

³⁸ Ibid 5-6.

³⁹ Askt, Daniel. "What can we learn from past anxiety over automation?" *Wilson Quarterly*. 2013. Online at <https://wilsonquarterly.com/quarterly/summer-2014-where-have-all-the-jobs-gone/theres-much-learn-from-past-anxiety-over-automation/>. Accessed July 1, 2017.

course wisely after proper planning for the future."⁴⁰ That same year, Herbert Marcuse described the full automation of necessary production as a moment of "historical transcendence toward a new civilization"⁴¹ in which private and social lives could be more profoundly experienced through leisure as opposed to capitalist labor.⁴²

If Marcuse and LBJ seem strange bedfellows in the realm of automation optimism, it is worth noting that Marcuse's hopes were pegged to the realization of a Marxist-style worker's paradise in contrast with President Johnson's attempt to spur gross domestic product (GDP) and other measures of capitalist growth informed by fomenting neoliberal ideologies. Beyond philosophical musings, Marcuse had some cause to believe in the potential of automation to lead to better labor conditions, as economist John Maynard Keynes had predicted as early as 1930 that technological innovation leveraged towards economic efficiency could increasingly reduce the average work week until, by approximately 2030, only a 15-hour work week would be necessary.⁴³

But, into the 1970s, the maximum 40-hour work week mandated by 1937's Fair Labor Standards Act had barely been reduced. In fact, from 1976-1993, the average work week increased by one hour for men, two hours for women, and the percentage of people working 49 hours or more steadily increased over that same period.⁴⁴ During this time, the economic recession of 1973-1975 signaled the end of the post-World War II U.S. economic boom and further signaled the changing character of automation and

⁴⁰ The American Presidency Project. "Remarks Upon Signing Bill Creating the National Commission on Technology, Automation, and Economic Progress." August 19, 1964. Online at <http://www.presidency.ucsb.edu/ws/?pid=26449>. Accessed July 1, 2017.

⁴¹ Marcuse, Herbert. *One-dimensional man: Studies in the ideology of advanced industrial society*. Sphere Books (1964): 40.

⁴² Marcuse also realized that - because workers did not control the automative means of production - industrial production standardized both products and workers (their "one-dimensionality") so that workers were neutralized of their political, resistive energies.

⁴³ Keynes, John Maynard. "Economic possibilities for our grandchildren (1930)." *Essays in persuasion* (1933): 358-73.

⁴⁴ Bureau of Labor Statistics. "How Long is the Workweek?" Feb., 1997 Online at <https://www.bls.gov/opub/btn/archive/how-long-is-the-workweek.pdf>. Accessed July 1, 2017.

its relationship to industrial frameworks. In 1973, as the economy began stagnating, Daniel Bell published *The Coming of the Post-Industrial Society*, a work that reconceived the nature and importance of automated technological performance.

For Bell, the post-industrial society marked a shift from goods-based manufacturing to an information-based service economy. In this sense, industries would become less concerned with manufacturing tangible goods and instead reorient their business models to prioritize an economics of information. Integral to this notion of a post-industrial society is the valorization of science-based rationality as a means of improving on human capabilities for decision-making processes. Rather than rely on human intuition to make informed decisions, Bell indicated that more reliable (i.e. rational) decisions were possible through what he termed "intellectual technology." An intellectual technology is one that enables complex calculations and analyses of information through algorithms and computers.⁴⁵ These technologies are distinguished by "efforts to define rational action and to identify the means to achieving it," efforts that involve the "substitution of algorithms...for intuitive judgments" as a move away from the presumably less rational and more unaccountable machinations of human intellectual judgment.⁴⁶

As post-industrial discourses considered "automation and ideology" and "the myth of automatism" in the 1980s and onwards,⁴⁷ the centrality of information, knowledge, and intellect as the means and outcomes of post-industrial work performance factored into the way information society and network society theorists addressed concomitant shifts in automated technologies, the globalization of economic

⁴⁵ Bell, Daniel. *The Coming of the Post-Industrial Society: A Venture In Social Forecasting*. Basic Books (1976): 29-30.

⁴⁶ Ibid 29-30.

⁴⁷ Feenberg, Andrew. *Critical theory of technology*. Vol. 5. New York: Oxford University Press, 1991.

markets, and organizational labor modalities oriented around work performed through advanced computational technologies.⁴⁸ When Frank Webster notes the centrality of “*theoretical knowledge/information*” to the machinations of everyday life in the information society, he cites utopian cultural imaginings around the “automated factory” and 1970s-1980s micro-processing breakthroughs as feeding into cultural enthusiasm for technologically-driven change proffered by industry and cultural adherents alike.⁴⁹ Armond Mattelart notes the origins of the information society lie in the invention of automated artificial intelligence and the formal usage of “information age” among WWII-era researchers.⁵⁰ In a similar vein, network society theories cite “*workflow automation*”⁵¹ as a principal means of organizing and streamlining office work made possible by networked computers as “technologies of automation par excellence.”⁵²

Concurrent with the increasing address of automation by information society and network society theories, David Noble’s landmark *Forces of Production: A Social History of Automation* (first published in 1984) undertakes a concrete historical analysis to methodologically validate the social construction of technology. He focuses on automation because it is “the hallmark of twentieth-century manufacturing technology” (xiv) and provides fruitful grounds for examining the ways “technical possibilities have been delimited by social constraints.”⁵³ Both drawing from and pushing back against social constructivism, the

⁴⁸ Clement, Andrew. “Office Automation and the Technical Control of Information Workers.” In Mosco, Vincent, and Janet Wasko, eds. *The political economy of information*. Univ of Wisconsin Press (1988): 217-246; Mattelart, Armond. *The information society: An introduction*. Sage, 2003; Masuda, Yoneji. *The information society as post-industrial society*. World Future Society, 1980; Webster, Frank. *Theories of the information society*. Routledge, 2014; Lyon, David. *The information society: Issues and illusions*. John Wiley & Sons, 2013; Van Dijk, Jan. *The network society*. Sage Publications, 2012; Hassan, Robert. *Media, politics and the network society*. McGraw-Hill Education (UK), 2004; Barney, Darin. *The network society*. Vol. 2. Polity, 2004.

⁴⁹ Webster, *Theories of the Information Society*, 9.

⁵⁰ Mattelart, *The Information Society*, 2.

⁵¹ Van Dijk, *The Network Society*, 69.

⁵² Barney, *The Network Society* Vol. 2, 91.

⁵³ Noble, David. *Forces of production: A social history of industrial automation*. Routledge (2011): xiv.

social shaping turn for science and technology studies (STS) and its concerns for “socio-economic patterns embedded in both the *content of technologies* and the *processes of innovation*”⁵⁴ explore industrial cultures of factory automation⁵⁵ and the “age of automation” online education beginning in the 1980s.⁵⁶ In the increasingly automated office, another “age of automation” was reshaping the organizational and productive capacities of workers undertaking knowledge-based work through increasingly sophisticated and networked computers.

Manuel Castells accounts for three phases of office automation beginning in the 1970s and evolving in approximate correspondence to the 1980s and 1990s. In the first phase, characteristic of the 1970s, office work was increasingly managed by specialists using batch processing capabilities of mainframe computers. Office work functions thus became “standardized, routinized, and deskilled for the majority of clerical workers,”⁵⁷ even though many of these clerical workers were not necessarily directly interacting with computers.

Nonetheless, when a 1983 *Christian Science Monitor* article christened “the new automation” as one “combining robots and quickly adjusted computer control,”⁵⁸ it implicitly referenced the increasing dependency on robots and computers for undertaking standardized approaches to decision-making based on complex interactions with data. While algorithmic capabilities didn't necessarily replace hu-

⁵⁴ Williams, Robin, and David Edge. “The social shaping of technology.” *Research Policy* 25, no. 6 (1996): 866 [italics in original].

⁵⁵ J. Martin Corbett, “The Cultural and Social Shaping of Factory Automation,” In Eds. Rasmussen, Lauge, and Felix Rauner. *Industrial cultures and production: understanding competitiveness*. Springer Science & Business Media (2012): 40-57.

⁵⁶ Hamilton, Edward. *Technology and the Politics of University Reform: The Social Shaping of Online Education*. Springer, 2016.

⁵⁷ Castells, Manuel. *The rise of the network society: The information age: Economy, society, and culture*. Vol. 1. John Wiley & Sons (201): 262.

⁵⁸ “The New Automation.” Feb. 24, 1983. Online at <https://www.csmonitor.com/1983/0224/022411.html>. Accessed July 1, 2017.

man intelligence and judgment, technological automation became increasingly linked with a level of intelligence that suggested the intellectual versatility of human cognition. In this sense, "intelligence" (or, "intellect," as Bell preferred) would increasingly become associated with automation, especially as computer automation became more prominent as a circumstance of office work in the 1980s.

By the mid-1980s, Castells' second phase of office automation had taken hold, a phase characterized by the move from mainframe computers to micro-computing and the networking of microcomputer workstations. Widespread adoption of this brand of office automation was slow, however, and because the institutional will to implement the full possibilities of computer networking lagged behind technological capability, it would take another decade or so until office automation was more universally realized. Castells' third phase of office automation speaks to this realization, as the 1990s saw the escalating integration and networking of microcomputers so that they ultimately formed an "interactive web that is capable of processing information, communicating, and making decisions in real time, "a web transcending the mere use of computers by office workers and instead offices themselves became "interactive information systems."⁵⁹ As a result, office work became increasingly dislocated from material office spaces so that office work now trickled into the home, coffee shop, and other "virtual offices" enabled by the remote capabilities of computational networking.

Alongside Castells' phases of office automation from the 1970s to 1990s, the field of artificial intelligence research was undergoing a series of turbulent phases, including two "AI Winters" in the late 1970s and late 1980s/early 1990s, each characterized by a chill on investment after periods of progress and hype around AI's technological feats.⁶⁰ Nonetheless, after IBM's Deep Blue defeated world-renown chess champion Garry Kasparov in 1997, cultural awareness of artificial intelligences gradually began to move away from conceptions of niche tinkering to more readily consider the social implications of AI.

⁵⁹ Castells, *The Rise of the Network Society*, 262.

⁶⁰ Knight, Will. "AI Winter Isn't Coming." MIT Technology Review. Dec. 7, 2017. Online at <https://www.technologyreview.com/s/603062/ai-winter-isnt-coming/>. Accessed July 1, 2017.

Moreover, the Deep Blue-Kasparov chess matches epitomized the potential of AI as technologies possessed with fluid and versatile intelligence seemingly on par with human counterparts. In this way, artificial intelligence in the late 1990s and into the 2000s seemed poised to more profoundly realize Bell's "intellectual" technologies and the specter of their substitution for humans, especially as the Deep Blue-Kasparov affair and subsequent developments brought "machine learning" to the fore of automated possibilities alongside artificial intelligence and algorithms.

Concurrent with this timeline, from the early 1980s to the present, human-computer interaction (HCI) focuses on automation as a dynamic among the interface of human performance on computers and the design of computers for such performance, in addition to closely-related interdisciplinary sub-fields branching off from HCI: human-machine interaction (HMI), human-machine collaboration/communication (HMC), human-robot interaction (HRI), human-robot collaboration/communication (HRC), human-automation interaction, and human-automation collaboration. Incorporating scholarship and methodologies from computer science, engineering, anthropology, sociology, communication, and other (primarily social science) disciplines. Anthropologist Lucy Suchman looms large over HCI and its sub-disciplines, as her *Plans and Situated Actions: The Problem of Human-machine Communication* (1987) and its follow-up *Human-Machine Reconfigurations: Plans and Situated Action* (2007) respectively constitute the intellectual groundwork for HCI analysis and an overview of HCI's progress and adaptability over a period of two decades. While the particulars of my concerns and methodological practice differ from Suchman and central tendencies of HCI scholarship, I align with concerns for shared conditions among human and intelligence machines, as my evocation of human-machine autonomy stresses autonomy as a shared condition rather than a circumstance differently situated for humans and automated counterparts. Moreover, my use of human-machine autonomy borrows from Suchman's recent use of "human-

machine autonomies” to analyze automated weapons systems with autonomous potentials and implore considerations of autonomy as realized within human-machine interfacing.⁶¹

Building off these developments, automation in the contemporary moment is often predicated on "artificial intelligence, 'mechanical minds,' and smart bots that can teach themselves things they aren't pre-programmed to do."⁶² If mid-century automation was characterized by pushbutton controls and informational feedback loops, and a subsequent iteration saw advances in the sophistication of automated computational processes to streamline and rationalize decision-making processes, the current moment of automation is primarily characterized by possibilities for automated processes to achieve (and supersede) intelligence on par with human beings.

Whereas previous iterations of automation suggested the replication of blue-collar manual labor and then low-skilled white-collar clerical tasks, the contemporary moment conceives of a forthcoming automated intelligence capable of performing complex functions and jobs historically understood to be the sole province of human intellect. Moreover, today's automation is not merely about the ability to perform in accordance with sophisticated programming instructions; rather, today's automation understands machine learning, deep learning, artificial intelligence, algorithms, and other computational constructs increasingly program technologies to learn and evolve at a remove from direct human control. In this sense, contemporary automation goes beyond the performances and techniques emerging technologies streamline, standardize, and otherwise make more efficient.

Instead, today's automation distinguishes itself based its capacity to undertake intellectual, cognitive, and social traits that allows humans to see automation as a framework impeding on not only their laboring capacity, but their uniqueness as highly-intelligent beings. If automation would first "replace

⁶¹ Suchman, Lucy Alice, and Jutta Weber. "Human-machine autonomies." In Bhuta, Nehal, and Claus Kreß, eds. *Autonomous weapons systems: law, ethics, policy*. Cambridge University Press (2016): 75-102.

⁶² Neal, Meghan. " Why Automation Today Is Like Computers in the 1980s." *Motherboard*. Aug. 13, 2014. Online at https://motherboard.vice.com/en_us/article/gvyde7/why-automation-today-is-like-computers-in-the-1980s-video. Accessed July 1, 2017.

men by machines"⁶³ and then entailed the "substitution of algorithms...for intuitive judgments"⁶⁴ contemporary automation is conceived by many as a replacement or a substitute for *human intellect* beyond just the tasks humans perform through such intellect. In this context, automated technologies are oriented towards autonomous states as they become more intelligent and demonstrate increasing prowess for self-determining courses of action. Through this intelligence, they intake vast amounts of information and undertake fluid decision-making processes akin to a human being's capacity to situationally-analyze and make self-determinations based on their understanding of the world. Nonetheless, the intelligence of contemporary automation does not break or rupture human autonomy and dignity, as human-machine autonomy entails variability and nuance as to the way intelligence among humans and automated machines experiences shared alternating intensities of autonomous potential. While human-like intelligence is central to the technological character of contemporary automation, "contemporary" in this context entails a period from 2011-2017 in which the confluence of significant innovations, industrial milestones, and socio-economic circumstances elevated the cultural visibility and awareness of automation and autonomous potentiality.

1.9 Contemporary Automation

This project is primarily concerned with a six-year timeframe from 2011-2017, a stretch of time in which the contemporary character of automation took shape, "autonomy" and "autonomous" were increasingly used as descriptors for emerging technological conditions, notions of "algorithmic" and "automatic" turns began to foment in academic literatures, industry and trade discourse began to forecast and prognosticate around the implications of advanced automation, social and economic frameworks

⁶³ Pollack, *The Economic and Social Consequences of Automation*, 5.

⁶⁴ Bell, *The Coming of the Post-Industrial Society*, 29.

were increasingly proposed as a means of offsetting potential pratfalls of automation, and cultural representations across media increasingly pitted humans in conflict against machines possessed with high degrees of intelligence and agency.

The timeframe 2011-2017 is critical to understanding automated technologies as increasingly oriented towards autonomous conditions and how this orientation interlocks with motivations of actors stretching across private institutions, legislative and regulatory entities, governance bodies, and public and domestic spheres. Notably, during this timeframe, *automated technologies* increasingly become *automated media technologies*, as automation proliferates among interactions with media texts (i.e. automated recommendations on Netflix), cultural practices associated with media texts (autoplay features encouraging binge-watching), media marketing (tie-in transmedia narratives accessed through Alexa “skills”⁶⁵), and creative media labor (using IBM’s Watson to deliver a reliable first-cut composite of a film trailer⁶⁶), among others. Further, automated platforms and applications are increasingly a primary mediating force among tax preparation services and income tax filers, oncology doctors and patients, Domino’s Pizza and people with deplorable taste in pie-shaped foodstuffs. Automated media is both automated interactions with media and automated interaction as media, as indicated by “automated media” as a recent designation for the importance of automated processes to “the production and consumption of media content.”⁶⁷

Likewise, as automated technology became increasingly enmeshed with media content and practices, “automation” increasingly became the subject of forecasts, predictions, and prognostications around the potential consequences of increasingly autonomous technologies. As previously noted, these

⁶⁵ Janko Roettgers, “Amazon Echo Now Lets You Investigate the Murder of Bruce Wayne’s Parents,” *Variety*, Mar. 2, 2016, <https://variety.com/2016/digital/news/amazon-echo-alexa-batman-vs-superman-promotion-1201718896/>.

⁶⁶ Amelia Heathman, “IBM Watson Creates the First AI-Made Film Trailer – And It’s Incredibly Creepy,” *Wired*, Sep. 2, 2016, <http://www.wired.co.uk/article/ibm-watson-ai-film-trailer>.

⁶⁷ Napoli, Philip M. “Automated media: An institutional theory perspective on algorithmic media production and consumption.” *Communication Theory* 24, no. 3 (2014): 340-360.

foresights manifested across a wide array of forms, from think tank white papers to science fiction narratives, each extrapolating - in their own way - the present moment of technological capability towards a highly mechanized and mechanically-administered future, often conceived as “robot overlords” and “job-stealing” robots. These dystopic motifs both oriented a sense of the cultural implications of increasingly autonomous technologies and provided the means for utopian socio-economic counternarratives emanating from both neoliberal marketplaces and postcapitalist collectivists. Beyond extrapolated depictions and suppositions of automation-based implications, the tech and media industry witnessed significant moments that grounded automation in lived realities and enabled a more culturally-accessible means of experiencing automation with human-like intelligence firsthand.

From 2011-2017, a number of automated technologies either became publicly or selectively available, yet in both cases achieved widespread awareness as to potential implications for everyday life, notably four that constitute separate analysis in each chapter of this project: Uber’s mobile application for facilitating ridesharing (2011), IBM’s Watson (2013), Tesla’s Autopilot (2014), and Amazon’s Alexa (2015). There were also institutional circumstances that shaped how some entities were understood as significant movers in the world of increasingly autonomous technologies, including their business goals, technological innovations, and incumbency as marketplace entities increasingly broadening their productive sweep. This includes the transition from UberCab to Uber Inc. (2011), the first full calendar year of Tesla Motors as a publicly-traded company (2011), IBM’s release of Watson’s open API (2013), Uber founder Travis Kalanick resigning as CEO (2017), and Tesla Motors CEO Elon Musk expanding his institutional portfolio to include the non-profit OpenAI (2015) and the for-profit Solar City (2016), The Boring Company (2016), and Neuralink (2016).

The years 2011-2017 also saw the release of research, trend, and forecasting reports on the implications of automation and its attendant technologies, including reports by the Oxford Martin School (2013), Pew Research Center (2014; 2016; 2017), World Economic Forum (2016), Price Waterhouse

Cooper (2017), and McKinsey Global Institute (2017). Government bodies likewise became increasingly involved in formal moves to address policy and regulatory implications of automation. This includes state-level bills that address autonomous technologies and cars in NV (2011), MI (2013; 2016), FL (2012, 2016), TN (2016, 2017), GA (2017), alongside many others all considered and/or enacted between 2011-2017. The federal government also interjected itself to address both the thicket of these state-level autonomous vehicles laws (such as the Department of Transportation's Federal Automated Vehicles Policy 2017) and, more broadly, the economic implications of automation and artificial intelligence. On this latter front, the White House released reports on artificial intelligence (Oct. 2016) and automation and AI (Dec. 2016) during a two-month span in late 2016.

It was also during 2011-2017 that a number of popular and trade press books stressed concerns regarding human beings and increasingly autonomous technologies. These include *Our Final Invention* (2013), *Second Machine Age* (2014), *The Glass Cage* (2014), *Rise of the Robots* (2015), *Humans Need Not Apply* (2015), *Machines of Loving Grace* (2015), *Only Humans Need Apply* (2016), *The Industries of the Future* (2016), and *Fourth Industrial Revolution* (2017). Popular media representations also stressed the relationship between humans and increasingly autonomous technologies in films such as *Eva* (2011), *Her* (2013), *Sully* (2016), *Kill Command* (2016), *Ex Machina* (2015), *Morgan* (2016), *The Machine* (2013), *Automata* (2014), *Chappie* (2015), *Uncanny* (2015), *Avengers: Age of Ultron* (2015), *Transcendence* (2014), *Blade Runner 2049* (2017), *Prometheus* (2012), and *Alien: Covenant* (2017); television shows such as *Person of Interest* (2011 - 2016), *Almost Human* (2013-2014), *Humans* (2015 - present), *Westworld* (2016 - present) and *Black Mirror* (2011 - present); video games such as *The Talos Principle* (2014), *Deus Ex: Mankind Divided* (2016), and *Horizon: Zero Dawn* (2017); and comic books such as *Alex + Ada* (2013-2015), *Avengers A.I.* (2013-2014), *The Vision* (2015-2016), and *Descender* (2015 - present).

Furthermore, the timeframe 2011-2017 finds accords with recent calls to examine connective media and ecosystems beyond the first decade of their development and mass uptake in the 2000s. When

Jose van Dijck in *The Culture of Connectivity* analyzes the history of social media platforms between approximately 1999-2012, she offers 2012 as the year that significantly links this first decade of platform sociality to a forthcoming epoch with "automated connectivity at its core."⁶⁸ Where her timeframe is a necessary arc to "comprehend current tensions in the ecosystem in which platforms and ever-larger groups of users operate,"⁶⁹ my historical arc of 2011-2017 similarly unpacks tensions stemming from automation as a *connective* technological paradigm and how cultural discourses tend to *connect* imaginings around automation to social paradigms emerging in the next decade and beyond. Furthermore, this project is a natural progression of cultural analyses seeking to impart the complications of industry and social buzzword necessitating surefooted scholarly inquiry. Just as Henry Jenkins offers "cultural convergence" to explicate the implications of technologically-converged Web 2.0 paradigms⁷⁰ and Van Dijck deepens and clarifies nuances of "connectivity" favored by social media entrepreneurs, I likewise explicate the complications of "autonomy" amidst the foundational era of automated media, offering human-machine autonomy as a viable frame for explicating the dynamics of this era and laying a foundation for subsequent inquiry.

In the next section, the chapter outlines for my case studies – Autopilot, Watson, Alexa, and the Uber mobile application - more thoroughly evoke the importance of the 2011-2017 timeframe in relation to each object.

1.10 Chapter Summaries

Chapter 1 (this chapter) identities unresolved questions around contemporary automation and autonomy, sets up the argument, and outlines methodologies, stakes, and relevant contexts.

⁶⁸ Van Dijck, José. *The culture of connectivity: A critical history of social media*. Oxford University Press, (2013): 23.

⁶⁹ Ibid 5.

⁷⁰ Jenkins, Henry. *Convergence culture: Where old and new media collide*. NYU press, 2006.

Chapter 2 focuses on notions of autonomy leveraged by policymakers and Tesla CEO Elon Musk as the company attempts to design and rollout cars with highly-automated and autonomous capacities. Via a discursive analysis of the first formal federal policy to recommend consolidated practices for outlining regulatory scope, enacting state-level policies around highly-automated vehicles, and urging design specifications – the Federal Automated Vehicles Policy (FAVP) – I demonstrate complications of human autonomy as imagined by policymakers constructing and anticipating legal recommendations for state-level policy makers and designers of automated vehicles. These imaginings contrast with Musk’s discursive tendency to leverage “full autonomy” as a technological state extended to humans who undertake transport in Autopilot-powered vehicles.

I begin with this chapter in order to drive towards a more nuanced conception of human autonomy amidst highly-automated vehicles possessed with the potential for technological autonomy. Elsewhere in this project, I stress a transition from automation to autonomy. Here, however, the prominent interplay of advanced automation and autonomous agency among technological systems and processes warrant an address of both autonomous and automated conditions, especially as Autopilot-powered Tesla cars and other automated vehicles display evidence of autonomous potential. Moreover, the popular imagination and early reception around highly-automated vehicles tends to deploy autonomy as a shorthand for these vehicles and cultural implications. Therefore, unique to this chapter is the necessity of urging a more nuanced conception of human autonomy that addresses questions outside the purview of autonomous agents and automated interaction as described in scientific literatures and circulated across popular arenas. In short, as made clear by this chapter, it is necessary to address autonomy and automation, rework them both, and conceptualize a more precise understanding of human autonomy.

Musk’s conception of full autonomy reworks cultural fears around autonomous technology, yet does so in a manner definitionally and theoretically insufficient to describe the complications of human

autonomy that can emerge from rigorous analysis. Thus, I use the FAVP as a nodal point among interrelated policy and Tesla discourse to build towards a more nuanced conception of human autonomy, arguing for an ideology of human autonomy as a condition modeled in policy stipulations for technological and social control; modulated in its intensities and opportunities by political power struggles; and modulated in accordance with implications for the intersection of driving and media usage as cultural activities transpiring during passage in automated vehicles.

Chapter 2: 2011-2017 timeline: 2011 was the year of the first government policy for self-driving cars. On June 23, 2011, Nevada passed Assembly Bill 511. Section 8 of Assembly Bill 511 authorized the Department of Motor Vehicles to "adopt regulations authorizing the operation of autonomous vehicles on highways."⁷¹ Nearly a year later, in May 2012, the state issued its first self-driving car license. Even though Google's self-driving concept car was the recipient of this license, Tesla's Autopilot technology has rapidly ascended to the forefront of speculation around possibilities for autonomous driving ever since it debuted Autopilot in 2014. That same year, Tesla founder and CEO Elon Musk first claimed that some degree of autonomous driving would be possible by the end of 2017, as Musk planned a cross-county expedition "all the way from a parking lot in California to a parking lot in New York with no controls touched in the entire journey"⁷² that, as of mid-2018, has yet to materialize. The notion of "degrees" of autonomous driving was encoded in the Society for Automotive Engineers (SAE) International's Oct. 2014 information report "Taxonomy and Definitions for Terms Related to On-Road Motor Vehicle Automated Driving Systems."⁷³ The report outlined six levels of automated driving, ranging from "No Au-

⁷¹ https://www.leg.state.nv.us/Session/76th2011/Bills/AB/AB511_EN.pdf

⁷² <https://futurism.com/elon-musk-teslas-autonomous-car-will-drive-coast-to-coast-by-2018/>

⁷³ http://standards.sae.org/j3016_201401/

tomation" (0) to "Full Automation" (5). While the official report does not designate its levels as "autonomy" or "autonomous," SAE elsewhere refers to these levels as "automated/autonomous."⁷⁴ These levels and definitions were subsequently adopted by the U.S. Department of Transportation as part of their Federal Automated Vehicles Policy, released in September 2016. The Policy not only signaled a need to standardize definitions and classifications around autonomous capabilities, but also gestured towards the need for federal intervention stemming from an increasing number of state government bills that addressed autonomous vehicles between the passing of Nevada's 2011 bill and the 2016 Federal Automated Vehicles Policy, including Florida's House Bill 7027 which permits the operation of autonomous vehicles on public roads. As it currently stands, 41 states have considered legislation relating to autonomous vehicles, in addition to Washington D.C.

Chapter 3 concerns the relationship between the centrality of IBM's Watson AI to the company's business portfolio and the company's motivations to leverage policy to economically underwrite the training and upskilling of high-tech "New Collar" workers capable of working with Watson. When the New Collar Jobs Act was introduced into the U.S. House of Representatives in July 2017, the Act reflected IBM's cultural construction of New Collar Work and provisions central to its corporate goals, particularly as the Act enables IBM to seek remuneration for its encroachment into vocational training and cybersecurity initiatives in tandem with the importance of Watson to these and related company initiatives. In doing so, IBM situates Watson as an enhancer of human autonomy in the context of employability and productive vitality, even as the Act and the logics of New Collar speak to IBM's corporate autonomy as the company attempts to navigate shifts to its business model and digital economies.

As I will demonstrate through analysis of the New Collar Jobs Act, New Collar work emerges out of IBM's strategic use of "augmentation" to describe the productive and intellectual capacities of humans enhanced by collaboration with Watson and "cognitive" as a rubric for reconceptualizing Watson and

⁷⁴ See, for example, <http://articles.sae.org/15021/>

IBM's contemporary marketplace prowess. On this latter front, IBM's insistence on the augmentative capacities of Watson stems from a preference for "cognitive" as opposed to "artificial" intelligence, a means of reversing AI-based dystopian implications for human vitality and stressing the ability of Watson to inflect tech workers with its automated cognition. Moreover, "cognitive" also exemplifies IBM's attempt to assert its prowess in contemporary digital economies by stressing Watson as the signifier of the "cognitive era" of computing and IBM as the progenitor and corporate titan of this era. Ultimately, this chapter stresses the importance of autonomy as a critical attribute among IBM's politico-economic motivations and ensuing implications for emerging tech workers.

Chapter 3: 2011-2017 timeline. In 2011, Watson appeared on the television game show *Jeopardy* in competition against accomplished *Jeopardy* alums Ken Jennings and Brad Rutter. By the end of multiple rounds that aired on Feb. 14 and 15 of this year, Watson emerged victorious, prompting a groundswell of discourse aimed at the broader social implications of artificial intelligence and IBM's specific institutional plans for Watson's deployment in sectors such as health care and business enterprise. IBM's announcement of an open application programming interface (API) in 2013 facilitated both the technological integration of Watson into third-party technologies and also facilitated IBM's institutional goals for revenue generation. As of 2017, Watson appears to be the bright spot for these goals, as despite IBM reporting 20 straight quarters of year-over-year overall revenue declines in April 2017, revenues attributable to Watson increased for the fourth quarter in a row.⁷⁵

Chapter 4 shifts from government policy to corporate marketing, exploring complications of autonomy arising from Amazon's intent to market Alexa as the go-to consumer device for home automation. The considerable presence of Alexa at the 2017 Consumer Electronics Show (CES) and ensuing trade press is the primary means of allegorizing the relationship between notions of autonomy built into a

⁷⁵ <https://www.bloomberg.com/news/articles/2017-04-18/ibm-misses-estimates-in-20th-straight-quarterly-revenue-decline>

gendered technology and cultural ideologies of women's autonomy among public and private spheres. By demonstrating the ways new domestic technologies tend to both resist and capitulate to gendered conceptions of power and autonomy across public and private life, I argue that Alexa should be understood as possessed with complicated and contrasting autonomous potentials with respect to home automation and interrelated gender dynamics of domesticity and technology. As a gendered technology, Alexa allegorizes autonomy as an alternately ennobled and restricted condition for social life.

One of the first compilations is Alexa's autonomy in relation to software and hardware. As a singular software agent widely interoperable with a vast array of hardware devices and systems, Alexa encompasses gendered associations of *software* and *soft* power, associations with unthinking bodily automaticity, ineffectiveness for political change, and a highly diminished autonomy. On the other hand, Amazon markets Alexa as the "brain" of its Echo device, uplifting Alexa as highly-intelligent and politically empowered, a *soft empowerment* ennobling of autonomous potential that can be constructed, mobilized, and shared in accordance soft power's quest for affinity, kinship, and political plurality. In the context of work performed within the automated home, Amazon marketing dovetails with circumscribed notions of women as domestic laborers performing servile undertakings readying the home for respite from the workaday masculine world. Contrarily, however, Alexa is construed as possessing mastery of creative and flexible traits that enable her to determine mediated interactions, an autonomy in which Alexa is endowed with decision-making capacities for cultivating media, mediated interactions, and the professional and creative expertise associated with such capacities.

When Alexa's mobile capabilities are brought to bear, a tripartite dynamic emerges. In one view, Alexa possesses little autonomy to move from the domestic sphere into public life, as the Alexa mobile app transforms public life into a virtual domestic "room" such that Alexa is cordoned off from public life even when transported via mobile hardware out of the home. In another view, Amazon's insistence that Alexa "lives" in the computational cloud situates Alexa as omnipresent among public and domestic life,

autonomously moving in space and time, permeating the nonspace of the cloud and carrying with it utopian ideals of derealized and deconstructed social and spatial power dynamics. Finally, public APIs that enable third-party “hobbyist” developers to integrate Alexa into non-Amazon products and enhance Alexa skills resurface separations between an economic and technologically savvy masculine public and an emotional and technologically-consumptive feminized home. In this view, hobbyists writing and compiling code for public APIs associates with long-standing notions of public masculine work that drives economic vitality, as Alexa’s skills become associated with emotional work, the invisibility of this work, and the declining recognition of women as integral and foundational to the inception of profound computational paradigms. In this way, Alexa’s autonomy is not only diminished, but risks a similar paradoxical decline if Alexa’s increasing prolificacy and capabilities likewise become disassociated with the foundational attributes of women’s contributions and characteristics.

Chapter 4: 2011-2017 timeline: The 2011 availability of Apple's Siri for iPhone 4S marked a significant moment for public awareness and uptake of personal intelligence assistants. By the time Amazon's Alexa was released in late 2014, Siri had become somewhat synonymous with mobile voice assistance, perhaps one significant reason why Amazon heavily promotes Alexa for its in-home capabilities as realized through the company's Echo hardware. Amazon's aggressive move to assert the viability of Alexa as consumer choice for automating smart homes suggests an ambition to make Alexa as synonymous with smart homes as Siri is with smart phones. Given recent reports that Amazon controls 70% of the voice-controlled speaker market,⁷⁶ Amazon has both achieved rapid dominance in the personal voice assistant field and proved highly influential in defining the contours of the marketplace. Mike George's presentation at the January 2017 Consumer Electronic Show (CES) and the company's rollout and presentation of advancing Alexa capabilities at the show, a move seen by many the company's most aggressive move yet

⁷⁶ <https://techcrunch.com/2017/05/08/amazon-to-control-70-percent-of-the-voice-controlled-speaker-market-this-year/>

to make itself synonymous with smart homes and practical everyday experiences with domestic automation. Only a few months after the show, Brookfield Residential partnered with Amazon to build a series of smart homes that integrate the Alexa framework, a partnership intended to "demonstrate that smart home technology isn't reserved for expensive houses."⁷⁷ When viewed as evidence of Amazon's success at CES, the Brookfield partnership and subsequent accomplishments seem to epitomize a Wired headline that appeared shortly after CES 2017: "Alexa Just Conquered CES. The World is Next."⁷⁸

Chapter 5 analyzes an Uber application to patent a process for integrating and automating social media information as part of the company's ridesharing services. By conceptualizing Uber's interface as iconic and the persistence of its iconic dimensions within the typographical and pictorial components of the patent application, this analysis yields three interrelated complications that stress the implications of autonomy amidst intensified automated sociality.

First, Uber's intention to incorporate the social while maintaining a simplified interface entails a simplicity that both masks the complexities of automated sociality and enables users to see through this process, alternately restricting user autonomy by obfuscating the complex economic, technological, and legal circumstances informing Uber's automated sociality and granting autonomy through an overreliance on simplicity that enables users to reveal these otherwise masked complexities. Second, Uber's iconic interface coheres invisible orders of neoliberal society, inducing a neoliberal imaginary that structures the increasing privatization of social actors and information as the logical means of conceptualizing social interaction. Whereas the neoliberal imaginary proffers autonomy as a condition for neoliberal power brokers or consumeristic variability, the coherence of the Uber iconic interface also enables the iconoclastic rejection of neoliberal imaginaries, investing social actors with autonomy through prosocial

⁷⁷ https://www.washingtonpost.com/realestate/smart-home-model-integrates-amazons-alexa-technology/2017/04/06/f7b98682-fdeb-11e6-8f41-ea6ed597e4ca_story.html?utm_term=.00896615a6f6

⁷⁸ <https://www.wired.com/2017/01/ces-alexa-in-everything/>

imaginaries that both destroy iconicity and create the means to envision social solidarity. Finally, the Uber iconic interface is a relay for abstraction that casts into opposing directions of inequitable proportionality the real conditions of social life and an automated sociality that self-replicates the commoditization of this capital. If subject to a real abstraction that understands the immaterial nature of commodified sociality as the real conditions of social life, social autonomy becomes neutralized not because of the increasing autonomous sophistication of automated technology, but because of the instantiated belief that techno-economic autonomy is the way autonomy can be experienced.

Chapter 5: 2011-2017 timeline: In 2011, UberCab rechristened itself Uber Inc. and over the course of 2011 rapidly expanded its operations in U.S. and international cities and also expanded the availability of its mobile application. Uber also in 2011 received from the San Francisco Municipal Transportation Agency a cease-and-desist letter claiming the company was operating as an unlicensed taxi service. By the time Uber co-founder and CEO Travis Kalanick resigned in 2017 amidst controversies surrounding the company's corporate culture and business practices, Uber had in the intervening years been embroiled in a number of legal challenges regarding the company's designation as a transportation enterprise subject to regulatory frameworks, the designation of Uber drivers as non-employee independent contractors, and, notably, alleged patent infringement of Waymo autonomous vehicle technology. The company likewise faced social protests stemming from these issues, as well as accusations of sexual harassment engrained in its corporate culture and the seemingly rapacious deployment of surge-pricing. These developments increasingly underscored the importance of the Uber mobile application, including Uber's attempts to position the company as a *facilitator of transportation services* via app-based interfacing rather than a transportation service *per se*, and the deleting of the app during a widespread social media campaign (#deleteUber) in early 2017.

By shifting the frame from automation to autonomy, and arguing for human-machine autonomy, I complicate presiding dystopic and utopian conceptions of automation that cast autonomy into diametrically-opposed quarters and, instead, evoke a series of intertwined complexities striking at the heart of life in highly-automated times. In this way, I also lay the groundwork for further assessments stemming from the economic, technological, political, and social conditions at the heart of my analysis, an especially critical factor given the fast-moving nature around the development and cultural inception of autonomous technologies.

Chapter 6 summarizes key points, reinforces the viability of this approach, and offers suggestions for subsequent scholarship to build off the insights offered herein.

2 TESLA'S AUTOPILOT

For engineers, computer scientists, and other specialists in fields related to scientific design and research, autonomy is an ongoing concern with respect to highly-automated technological performance. Among robotics researchers, autonomous systems have received increasing focus since the 1980s. The journal *Robotics* launched in 1985 and by 1988 had changed its name to *Robotics and Autonomous Systems*,⁷⁹ preceding the 1994 debut of the journal *Autonomous Robots*.⁸⁰ Within autonomous systems and robotics research, autonomous software agents receive significant attention. Autonomous software agents are a class of software with imbedded abilities to determine an appropriate course of action in pursuit of a pre-determined goal. They are autonomous in the sense that they can *self-determine* – free from direct control or oversight – how to achieve the *pre-determined* goal. In the early to mid 1990s, autonomous software agents increasingly became the focal point of robotics researchers.⁸¹ This trend continued with the 1997 launch of the MIT Press series “Intelligent Robotics and Autonomous Agents”⁸² and the 1998 debut of the journal *Autonomous Agents and Multi-Agent Systems* and through the contemporary moment, a moment that includes very recent media studies research on autonomous software agents and the attribution of autonomy to highly-automated technologies and techniques (such as bots).

⁷⁹ <https://www.sciencedirect.com/journal/robotics-and-autonomous-systems/>

⁸⁰ <https://link.springer.com/journal/volumesAndIssues/10514>

⁸¹ See: Pattie Maes, ed. *Designing Autonomous Agents*, MIT Press, 1991.; Maes, Pattie. "Modeling adaptive autonomous agents." *Artificial life* 1, no. 1_2 (1993): 135-162; Dorigo, Marco, and Marco Colombetti. "Robot shaping: Developing autonomous agents through learning." *Artificial intelligence* 71, no. 2 (1994): 321-370; Langton, Christopher G., ed. *Artificial life: An overview*. MIT Press, 1995; Stan Franklin. *Artificial Minds*. MIT Press, 1995; Steels, Luc. "When are robots intelligent autonomous agents?." *Robotics and Autonomous systems* 15, no. 1-2 (1995): 3-9; Franklin, Stan, and Art Graesser. "Is it an Agent, or just a Program?: A Taxonomy for Autonomous Agents." In *International Workshop on Agent Theories, Architectures, and Languages*, pp. 21-35. Springer, Berlin, Heidelberg, 1996;

⁸² <https://mitpress.mit.edu/books/series/intelligent-robotics-and-autonomous-agents-series>

A 2016 special section of *International Journal of Communication* (IJoC) entitled “Automation, Algorithms, and Politics” begins with “Political Communication, Computational Propaganda, and Autonomous Agents,” an article that interrogates the role of autonomous agents in “computational propaganda,”⁸³ including the use of these agents as “proxies for political actors hoping to sway public opinion through the spread of propaganda and misinformation,” particularly through social media platforms.⁸⁴ The 2017 collection *Socialbots and Their Friends – Digital Media and the Automation of Sociality* features several essays that reference autonomy among human and socialbots. In this collection, Keiko Nishimura describes the creation of “semi-autonomous fan faction” between humans and character bots, a type of socialbot that can make decisions about how to converse with humans yet does not attempt to pass as a human being.⁸⁵ These bots are *semi*-autonomous since their ability to determine conversational flow and illicit a “non-human affect” depends on a “combination of operating programs, human understanding of these programs and interpretive activities.”⁸⁶ Similarly, Adrienne Massanari accounts for the semi-autonomous function of bots among Reddit communities and attempts to understand “social ramifications of bots as semi-autonomous actors” in the context of Reddit’s playful habitus.⁸⁷ Elsewhere in this collection, Guillaume Latzko-Toth refers to an “*imaginary of autonomy*” suggested by Internet Relay Chat (IRC) bots capable of interaction and information generation free from the directing hand of human programmers and IRC users.⁸⁸ Also in *Socialbots and Their Friends*, Andrea Guzman coins

⁸³ The authors of this article –Philip N. Howard and Samuel Woolley – are respectively the principal investigator and affiliate researcher for the Computational Propaganda Project, a cross-disciplinary project dedicated to investigating the interaction of algorithms, automation, and politics. See: <http://comprop.oii.ox.ac.uk/>

⁸⁴ Woolley, Samuel C., and Philip N. Howard. "Automation, algorithms, and politics | political communication, computational propaganda, and autonomous agents—Introduction." *International Journal of Communication* 10 (2016): 4882-4890.

⁸⁵ Keiko Nishimura, "Semi-Autonomous Fan Fiction: Japanese Character Bots and Non-human Affect," In *Socialbots and Their Friends*, pp. 144-160. Routledge, 2017.

⁸⁶ Ibid 135.

⁸⁷ Massanari, Adrienne L. "Contested Play." *Socialbots and Their Friends: Digital Media and the Automation of Sociality* (2017): 113.

⁸⁸ Latzko-Toth, Guillaume. "The Socialization of Early Internet Bots." *Socialbots and Their Friends: Digital Media and the Automation of Sociality* (2017): 47.

the term “vocal social agent” [(VSAs)] to describe Siri and other VSAs “designed to be autonomous and adapt to and assist users.”⁸⁹ Writing in 2017 on the “blockchain dreams” of Bitcoin adherents, Lana Swartz gestures towards Bitcoin’s economic and institutional and the insistence by these adherents that the digital currency is intended to “function autonomous of states or banks.”⁹⁰ Where these recent media studies analyses gesture towards autonomy as a condition among human interaction and automated sophistication, scientific specialists consider an array of interactions among humans and automation that demand further scrutiny through a media studies lens – particularly issues of “control” manifest among scientific automation literatures.

Among scientific literatures on autonomous agents and other-highly automated technologies, a primary concern is the degree of control exercised by – and between – humans and automated technique. The research area “human-automation interaction” (HAI) is particularly concerned with control as an operative function performed by humans and/or machines among automated systems.⁹¹ In 2017 article drawing from key insights gleaned from research on human-automation interaction, author Mica Endsley describes an “automation conundrum” whereby the increasing autonomy of technology causes humans to become less situationally aware and less apt to assume control of the technology when necessary.⁹² Part of this conundrum addresses the potential “full autonomy” of technology, as complete technological autonomy renders human control impossible. As Endsley notes, even the most advanced autonomous technology still requires humans to serve as “supervisory controllers,” with responsibilities

⁸⁹ Andrea L. Guzman, "Making AI safe for humans: A conversation with Siri," In *Socialbots and Their Friends* (2017): 70.

⁹⁰ Lana Swartz, "Blockchain dreams: Imagining techno-economic alternatives after Bitcoin," in Eds. Manuel Castells *Another Economy Is Possible: Culture and Economy in a Time of Crisis* (2017): 92.

⁹¹ See: Parasuraman, Raja, Thomas B. Sheridan, and Christopher D. Wickens. "A model for types and levels of human interaction with automation." *IEEE Transactions on systems, man, and cybernetics-Part A: Systems and Humans* 30, no. 3 (2000): 286-297; Parasuraman, Raja, and Victor Riley. "Humans and automation: Use, misuse, disuse, abuse." *Human factors* 39, no. 2 (1997): 230-253; Lee, John D., and Katrina A. See. "Trust in automation: Designing for appropriate reliance." *Human factors* 46, no. 1 (2004): 50-80.

⁹² Endsley, Mica R. "From here to autonomy: lessons learned from human–automation research." *Human factors* 59, no. 1 (2017): 5.

for oversight and cooperation when circumstances warrant human intervention.⁹³ When, for example, autonomous software is at play in a technological system, the role of a human “becomes one of monitoring and intervening in situations that the software cannot handle.”⁹⁴ In other words, control is at the heart of the automation conundrum: as technological autonomy increasingly assumes more control, humans are less apt to maintain vigilance and assume control under necessary conditions. And, paradoxically, the potential for totalized control through “full autonomy” induces human passivity as technological autonomy ascends towards this totalized state. Although HAI research is measured in its modes of inquiry, assessment, and results, the automation conundrum leans into a predominant cultural idea that autonomous technology is “out of control” and “follows its own course, independent of human direction.”⁹⁵ While scholars in technology studies acknowledge the ongoing presence of this cultural idea, the use of “autonomous technology” as an explanatory framework is largely derided for its myopic dependence on ideologically-imposed causality and technological determinism.⁹⁶ Nonetheless, issues of control persist among recent scientific literatures addressing autonomous agents, highly-automated technology, and human interaction. In this context, control is especially important as scientific researchers and a range of social actors attempt to grapple with the emergence of autonomous cars manifest through technological convergence of autonomous agents, automated digital connectivity, and vehicular engineering, particularly with respect to Tesla’s Autopilot.

⁹³ Ibid 5.

⁹⁴ Ibid 6.

⁹⁵ Winner, Langdon. *Autonomous Technology: Technics-Out-of-Control as a Theme in Political Thought*. MIT Press (1978): 13.

⁹⁶ See: Staudenmaier, John M. *Technology's Storytellers: Reweaving the Human Fabric*. Cambridge, MA: Society for the History of Technology and the MIT Press, 1985; Dusek, Val. *Philosophy of technology: An introduction*. Vol. 90. MaldenOxfordCarlston: Blackwell, 2006.

2.1 Tesla's Autopilot

Autopilot is Tesla's converged suite of hardware and software features that enable Tesla-produced vehicles to perform driving functions free from direct human operation. In the context of control, Autopilot controls varying degrees of vehicular performance free from direct human control. In September 2014, Tesla announced that all newly-produced Model S vehicles (Tesla's luxury-class car) would include Autopilot as a standard feature, and later added Autopilot as an optional feature for Model X cars (Tesla's mid-sized crossover SUV). Tesla's Autopilot takes its name from a more generalized assemblage of technologies enabling a vehicle to operate independent from direct human control, acknowledged by the company as a naming scheme chosen for its similarity to autopilot systems used by pilots to cede vehicular control of airplanes under particular circumstances.⁹⁷ In other words, the distinct technological features that comprise Tesla's intellectual property (Autopilot) advance from – and refer to – a broader universe of technological features enabling vehicles (planes, cars) to operate free from direct human control under certain conditions (autopilot). As of early 2018, the current version of Autopilot software is version 8.1, the most recent in a series of iterative releases beginning with the initial release of version 6.0 in September 2014.⁹⁸ While software updates add new features and expand upon existing features, a Tesla sales brochure for Model S summarizes Autopilot's baseline technological specifications, capabilities, and affordances:

“Autopilot combines a forward looking camera, radar, and 360 degree sonar sensors with real time traffic updates to automatically drive Model S on the open road and in dense stop and go traffic. Changing lanes becomes as simple as a tap of the turn signal. When you arrive at your destination, Model S will both detect a parking spot and automatically park itself. Standard equipment safety features are

⁹⁷ “Dual Motor Model S and Autopilot,” Tesla Motors, Oct. 10, 2014, <https://www.tesla.com/blog/dual-motor-model-s-and-autopilot>.

⁹⁸ The succession of releases includes version 6.0 (Sep. 2014), version 6.1 (Jan. 2015), version 6.2 (Mar. 2015), version 7.0 (Oct. 2015), version 7.1 (Jan. 2016), version 8.0 (Sep. 2016), version 8.1 (March 2017). See: “Software Updates,” Tesla Motors, <https://www.tesla.com/software>.

constantly monitoring stop signs, traffic signals and pedestrians, as well as for unintentional lane changes.”⁹⁹

Version 8.1 adds new features and expands upon many baseline functions, including advanced capabilities for autosteering, parallel parking, and “summon,” a feature that allows owners to initiate (via mobile application) the car’s ability to park itself and, alternately, navigate from a parked position to the owner.¹⁰⁰

Autopilot is one of many attempts by a range of incumbent and emerging companies and conglomerates to develop autonomous cars and/or software capable of performing autonomous functionality. As of early 2018, development and production of autonomous cars is underway at incumbent automobile manufactures (Aptiv, Audi, BMW, Ford, General Motors, Honda, Mercedes-Benz, Toyota, Volkswagen), and computer technology companies (Alphabet, Intel, Tesla, Lyft, Uber), in addition to computer technology companies focused more exclusively on the production of software undergirding autonomous functionality (Apple, Microsoft) and those that have made public gestures towards pursuit of autonomous cars (Amazon, Facebook). Increasingly, vertical and horizontal integration are driving forces behind such development, as incumbent automobile companies have purchased and/or invested in smaller (often startup) companies focused on developing software for autonomous cars,¹⁰¹¹⁰² and computer technology companies absorb companies more precisely focused software and computer

⁹⁹ “Model S – Premium Electric Sedan,” Tesla Motors, <https://www.tesla.com/sites/default/files/tesla-model-s.pdf>.

¹⁰⁰ “Software updates.” <https://www.tesla.com/software>

¹⁰¹ Dan Primack and Kirsten Korosec, “GM Buying Self-Driving Tech Startup for More Than \$1 Billion,” *Fortune*, March 11, 2016. <http://fortune.com/2016/03/11/gm-buying-self-driving-tech-startup-for-more-than-1-billion/>

¹⁰² Lucas Mearian, “Ford To Invest \$1B in A.A. Startup Toward Self-Driving Cars,” *Computer World*, Feb. 10, 2017, <https://www.computerworld.com/article/3168904/car-tech/ford-to-invest-1b-in-ai-startup-toward-self-driving-cars.html>.

technologies for automobiles,¹⁰³ in addition to partnerships among incumbent automobile manufacturers and computer technology companies.¹⁰⁴

In the onrush to capitalize on a forthcoming marketplace for autonomous cars, the rapid consolidation of companies with a potential stake in this market blurs the lines between automobile and technology company, as the technological convergence of automated digital connectivity and automotive engineering necessitates an interdependence on infrastructural and production capacities of companies operating in market sectors typically differentiated along lines of products (cars, computers) and services (software, mobile applications, transport). One of the primary reasons Tesla stands out among this rapidly-expanding field is its inhouse production of both automobiles and the software agent (Autopilot) powering autonomous capabilities, to say nothing of its self-designation as the “world’s only vertically integrated energy company,”¹⁰⁵ and in addition to the cultural prominence and celebrity status of Tesla CEO Elon Musk. More pertinently, however, as an early and aggressive entrant into the budding autonomous car marketplace, Tesla’s attempts to bring autonomous vehicles to market invites opportunities to understand how the cultural uses of Autopilot – and autonomous cars more generally – are prefigured by policymakers, regulators, engineering experts, business leaders, and others involved in the process of initiating policy recommendations for the cultural rollout of autonomous cars. Before these cars appear on roadways (outside of limited test-run exercises), federal and state regulatory scope, legal applications of technological “autonomy” and “automation” (as well as related terminology), and human interaction with and within these vehicles will already have been designated by political, scientific, and corporate

¹⁰³ Mallory Locklear, “Intel’s Acquisition of MobileEye is Officially Complete,” *Engadget*, Aug. 8, 2017, <https://www.engadget.com/2017/08/08/intel-acquisition-mobileeye-complete/>.

¹⁰⁴ Brian Krzanich, “Waymo and Intel Collaborate on Self-Driving Car Technology,” Intel Newsroom, Sep. 18, 2017, <https://newsroom.intel.com/editorials/waymo-intel-announce-collaboration-driverless-car-technology/>.

¹⁰⁵ “ANNUAL REPORT ON FORM 10-K FOR THE YEAR ENDED DECEMBER 31, 2016,” Tesla Motors, <http://ir.tesla.com/secfiling.cfm?filingid=1564590-17-3118&cik=1318605>.

powerbrokers. Thus, it is critical to analyze policymaking for what it portends as a loadstone for conceptualizing notions of autonomy built into Autopilot, political frameworks governing Autopilot, and how these technological and political aspects of autonomy anticipate possibilities for human autonomy as in relations to autonomous cars.

2.2 Autonomy, Control, and Freedom

These notions of autonomy supersede technological autonomy described by scientific research and invoke the contested and contrasting dynamics of human autonomy animated by attempts to legally codify imaginings for the autonomous potentials of human beings interacting with autonomous vehicles. My primary aim is to situate Autopilot as an autonomous agent beyond mere technological concerns and instead argue for Autopilot as a software agent inflected with both imbedded and explicit conceptions of freedom and control indicative of how human autonomy is imagined, contested, and transitioned amidst political conceptions around the legal and technological status of automated vehicles. This notion of control acknowledges and carries with technological control and other aspects of both human and vehicular control analyzed by scholarship on autonomous agents and human-automation interactions. But, my method goes further to draw in control and freedom as cultural conditions ensnarled among corporate and political actors attempting to maximize their own control over legal definitions, regulatory scopes, and human uses for Autopilot and other autonomous technologies. Thus, my argument hinges on autonomy as a human condition emerging from the correspondence between control and freedom, a tension between control as an imposed power restricting freedom and control as a means of asserting power to maximize freedom. Where Autopilot invites opportunities to address these critical aspects of autonomy, the primary object of analysis that enlivens these aspects of autonomy is the first formal attempt to recommend policies and regulations for autonomous cars – the 2016 Federal Automated Vehicles Policy (FAVP).

2.3 The Federal Automated Vehicles Policy (FAVP)

Released in September 2016, the FAVP is the first federal policy to acknowledge the “digital era increasingly reaches deeper into transportation” and grapple with this technological convergence through formal federal recommendations.¹⁰⁶ The FAVP is a guidance document, in that it does not attempt to implement rulemaking. Instead, it offers recommendations that can “speed the delivery of an initial regulatory framework” necessitated by the rapid speed of automated vehicle development and numerous ramifications posed by the mass uptake of these vehicles.¹⁰⁷ These recommendations are primarily aimed at state-level policymakers, manufacturers, and others directly involved in the production, design, testing, and rollout of “highly-automated vehicles” and therefore are bracketed into four sections: Vehicle Performance Guidance; Model State Policy; NHTSA’s Current Regulatory Tools; and New Tools and Authorities.¹⁰⁸ One of its most significant facets receives the bulk of my analytical attention: levels of automation that stipulate technological function and human interactions across a six-tiered strata. Prior to their integration into FAVP, these levels were developed by DOT and reworked by SAE amidst attempts to build legal and technological consensus around automated vehicle policy. Thus, the consistency of these levels across policy formulations provide telling insights into the political struggles, contestations, and alterations that entailed conceptions of human autonomy prone to shift in intensity and possibility.

2.4 Methodology

In terms of my analysis, and with regard to policy language and policymaking processes, my methodological approach treats FAVP as a “nodal point” among a series of preceding and successive attempts to initiate and revise policies that imbed conceptions of human autonomy along lines of control and

¹⁰⁶ Federal Automated Vehicles Policy,” Department of Transportation Sep. 2016, <https://www.transportation.gov/sites/dot.gov/files/docs/AV%20policy%20guidance%20PDF.pdf>.

¹⁰⁷ Ibid.

¹⁰⁸ Ibid.

freedom. A nodal point, as described by Laclau and Moueffe, is a privileged site among a broader network of discursive formations.¹⁰⁹ While the FAVP could be read as a standalone text, the discourses feeding into, coursing through, and emanating from FAVP are not solely parked in the text of this singular policy and instead represent a significant moment among a series of policymaking and regulatory struggles over taxonomic definitions, regulatory scope, and technological design, performance, and operation. Two preceding documents - the 2013 Department of Transportation (DOT) Statement of Policy (henceforth: 2013 DOT Statement) and the 2014 Society of Automotive Engineers International (SAE)'s *Taxonomy and Definitions for Terms Related to Driving Automation Systems for On-Road Motor Vehicles* (henceforth: 2014 SAE Taxonomy) – initiated a process of contested terminology, foci, and functionality germane to both human operation of an automated vehicle and the vehicle's technological capability. Among these contestations, differing designations and applications of “automated,” “autonomous,” “driver,” “user,” and “control” reveal conflicting ideas as to the focal point of policy frameworks (vehicles or drivers), when (and if) drivers should be considered “users,” distinctions among degrees of automated technique, and control as technological functionality, human operation, and social phenomena at the interface among contesting power brokers.

Thus, by treating FAVP as a nodal point, it marks FAVP as significant for what it brings together and what it reveals about autonomy in the context of freedom and control rather than what it merely possesses. Beyond reaching across domains internal and external to FAVP for discursive meaning, my approach also enables – via Bruno Latour – discourse itself to be understood not as a fixed realm floating separately from societal (read: political, economic, technological) domains but rather a “population of actants that mix with things as well as with societies, uphold the former and the latter alike, and hold onto them both.”¹¹⁰ In other words, my methodology situates FAVP as a significant moment in a series

¹⁰⁹ Ernesto Laclau, and Chantal Mouffe, *Hegemony and Socialist strategy: Towards a Radical Democratic Politics*, (Verso Books, 1985): 112.

¹¹⁰ Bruno Latour, *We Have Never Been Modern*. Harvard University Press (1993): 90.

of significant discourses that embed notions of autonomy among intermixed ideologies of control and freedom when “things” (digitally-connective and automotive technology) and corresponding economic, political, and ideological paradigms converge and form cohabitated relations.

While my objective is to read FAVP and related policy texts for what they reveal about human autonomy, my analysis of a policy aimed at regulatory scope gestures towards areas of media policy studies similarly concerned with cultural implications emerging out of attempts to regulate and drive political consensus around federal and state legal address of media technologies and systems. In this context, media regulation and its political, social, and economic informants and effects has been significantly analyzed by Jennifer Holt,¹¹¹ Robert McChesney,¹¹² Des Freedman,¹¹³ Susan Crawford,¹¹⁴ and Philip Napoli,¹¹⁵ among others.¹¹⁶ Where these scholars underscore the importance of regulatory and policymaking texts, bodies, ideologies, and power struggles on cultural implications for media and technology, I endeavor to likewise unmask the implications for human autonomy as encoded in early attempts by political power brokers to imagine and influence the cultural uptake of automated vehicles.

¹¹¹ Jennifer Holt, *Empires of Entertainment: Media Industries and the Politics of Deregulation, 1980-1996*. Rutgers University Press, 2011; Jennifer Holt, “Platforms, Pipelines, and Politics – The iPhone and Regulatory Hangover,” Snickers, Pelle, and Patrick Vonderau, eds. *Moving data: The iPhone and the future of media* (Columbia University Press, 2012): 140-154; Jennifer Holt, “Regulating Connected Viewing,.” Jennifer Holt and Kevin Sanson, eds. *Connected Viewing: Selling, Streaming, & Sharing Media in the Digital Age* (2013): 19-39.

¹¹² McChesney, Robert W. *Rich media, poor democracy: Communication politics in dubious times*. New Press, The, 2015; McChesney, Robert D. *The problem of the media: US communication politics in the twenty-first century*. NYU Press, 2004; McChesney, Robert W. *The political economy of media: Enduring issues, emerging dilemmas*. NYU Press, 2008.

¹¹³ Freedman, Des. *The politics of media policy*. Polity, 2008; Freedman, Des. *The contradictions of media power*. Bloomsbury Publishing, 2014;

¹¹⁴ Crawford, Susan P. *Captive Audience: The Telecom Industry and Monopoly Power in the New Gilded Age*. Yale University Press, 2013.

¹¹⁵ Napoli, Philip M. “The marketplace of ideas metaphor in communications regulation.” *Journal of Communication* 49, no. 4 (1999): 151-169; Napoli, Philip M., and Michael Zhaoxu Yan. “Media ownership regulations and local news programming on broadcast television: An empirical analysis.” *Journal of broadcasting & electronic media* 51, no. 1 (2007): 39-57;

¹¹⁶ Lunt, Peter, and Sonia Livingstone. *Media regulation: Governance and the interests of citizens and consumers*. Sage, 2011; Feintuck, Mike. *Media regulation, public interest and the law*. Edinburgh University Press, 2006; Puppis, Manuel. “Media governance: A new concept for the analysis of media policy and regulation.” *Communication, Culture & Critique* 3, no. 2 (2010): 134-149.

2.5 Convergence Culture and Digital Media Theory

My methodological approach is levitated by incorporating pertinent strands of digital media theory. Notably, convergence culture speaks to popular and policymaking conceptions of human autonomy as transitional and fluctuating along lines of cultural uses for Autopilot and other vehicles enlivened by automated connectivity. As popularized by Henry Jenkins and taken up widely by other digital media scholars,¹¹⁷ convergence culture moves beyond the integration of otherwise distinct technologies and technological function to analyze a “cultural shift” between those who produce and develop technologies and those who use and consume them.¹¹⁸ Jenkins’ concept describes the convergence of “old” media (film, television, other media texts) with “new” media (online interactivity, digital platforms) and stresses the increasingly blurred line between “producer” and “consumer” as a significant paradigm in this cultural shift, as convergence is a process occurring “within the brains of individual consumers and through their social interactions within others” and therefore endowing consumers with degrees of power that upturn historical demarcations between producers and consumers.¹¹⁹

As I will demonstrate, the imagined cultural uses of Autopilot correspond to popular conceptions and legal stipulations for when and how humans intervene to control driving operations, the extent to which humans are expected to maintain situational awareness for operation control, and the extent to which humans are free to pursue other activities when levels of automated functionality control the bulk of vehicular operation. While technological convergence of automated vehicles has been significantly analyzed by scientific scholars and researchers, my application of convergence culture illuminates and complicates demarcations among “drivers” and “users” (as well as the application of “automation”

¹¹⁷ See: Deuze, Mark. *Media Work*. Polity, 2007. Couldry, Nick. "More sociology, more culture, more politics: or, a modest proposal for 'convergence' studies." *Cultural Studies* 25, no. 4-5 (2011): 487-501; Örnebring, Henrik. "Alternate reality gaming and convergence culture: The case of Alias." *International Journal of Cultural Studies* 10, no. 4 (2007): 445-462.

¹¹⁸ Henry Jenkins, *Convergence Culture: Where Old and New Media Collide*, (NYU Press, 2006): 2-3.

¹¹⁹ *Ibid* 3.

to describe “driving” or “vehicles”) between FAVP and its provisional policy forerunners (2013 DOT Statement and 2014 SE Taxonomy), particularly as these designations correlate with how human autonomy is alternately enabled or restricted by controlling vehicular operation or ceding control to technological operation. Thus, where convergence culture invokes the rupture of “producers” and “consumers,” I draw from Jenkin’s use of convergence culture and other digital media theory that directly or indirectly leverages this logic to offer similar ruptures along lines of “production” and “user,”¹²⁰ “audience” and “user,”¹²¹ and “participation” and “consumption.”¹²² While convergence culture illuminates the relationship between Autopilot and human autonomy, other pockets of digital media theory situate human autonomy as not only shifting, but continually modulated with respect to cultural uses and implications of software, as well as contaminant notions of control and freedom. In this vein, , the relationship among software, control, and freedom has been explicitly analyzed by Alexander Galloway¹²³ and Wendy Chun,¹²⁴ whose work I leverage, in addition to digital media and social theorists concerned with software, socio-techno control, and cultural implications.

My analysis begins with Elon Musk’s publicly-stated ambition for Autopilot to enable Tesla cars to achieve “full autonomy.” It is necessary to begin with the wider cultural usage of autonomy in order to reveal the incomplete nature of this popular usage and move towards a more nuanced conception of autonomy emerging from Musk’s economic motivations, conceptions of human autonomy among FAVP and preceding policy texts, and the ways autonomy is modulated through these conceptions. By beginning my analysis with complications of autonomy and automation across popular and political arenas, I

¹²⁰ Bruns, Axel. *Blogs, Wikipedia, Second Life, and Beyond: From Production to Prodsusage*. Peter Lang, 2008.

¹²¹ Marshall, Philip D. "New media as transformed media industry" in *Media Industries: History, Theory, and Method*, eds. Jennifer Holt and Alissa Perren (Wiley: 2009): 81-89.

¹²² Jenkins, Henry, Sam Ford, and Joshua Green. *Spreadable Media: Creating Value and Meaning in a Networked Culture*. NYU press, 2013.

¹²³ Galloway, Alexander R. *The Interface Effect*. Polity, 2012; Galloway, Alexander R. *Protocol: How control exists after decentralization*. MIT Press, 2004.

¹²⁴ Chun, Wendy Hui Kyong. *Control and Freedom: Power and Paranoia in the Age of Fiber Optics*. MIT Press, 2008; Chun, Wendy Hui Kyong. *Programmed Visions: Software and Memory*. MIT Press, 2011.

set the stage for more profound ways of understanding the complications of autonomy among machines, their makers and governing forces, and those who socially interact with them.

2.6 Convergence: Elon Musk and Full Autonomy

Elon Musk prolifically uses “autonomous” and “autonomy” in explicit reference to Autopilot’s technological ability to control most – if not all – vehicular operations. He’s especially apt to make predictions about Autopilot’s ability to enable “full” (or, alternately, “complete”) autonomy. From a technological standpoint, Musk considers full autonomy not just a future possibility but a “solved problem.” At the 2016 Recode conference, Musk announced that Tesla resolved questions of *if* and *when* autonomous driving will be technologically realized, as he indicated “we’re less than two years from complete autonomy.”¹²⁵ The “solved problem” quote reverberated widely across popular press,¹²⁶ as did Musk’s announcement in October 2016 that all forthcoming new Tesla vehicles will come standardized with Autopilot hardware and software capable of “full autonomy” and its social benefits: “full autonomy will enable a Tesla to be substantially safer than a human driver, lower the financial cost of transportation for those who own a car and provide low-cost on demand mobility for those who do not.”¹²⁷ Through the integration of cameras with 360-degree visibility, ultrasonic detectors with thorough environmental sensing capabilities, and “enhanced processing” of environmental conditions, Autopilot’s full autonomy is one that promises to provide “a view of the world that a driver alone cannot access, seeing in every direction simultaneously and on wavelengths that go far beyond human senses.”¹²⁸ Musk’s predications

¹²⁵ Lisa Eadicico, “Elon Musk Just Made These 5 Bold Claims About the Future,” *Time*, June 2, 2016, <http://time.com/4354864/elon-musk-mars-driverless-cars-apple-tesla-spacex/>.

¹²⁶ See: *Ibid*; Brad Stone, “Elon Musk’s Future: Robot Cars, People on Mars and AI Run Amok,” *Bloomberg*, June 2, 2016, <https://www.bloomberg.com/news/articles/2016-06-02/elon-musk-s-future-robot-cars-people-on-mars-and-ai-run-amok>; Danny Yadron, “Two Years Until Self-Driving Cars Are on the Road – is Elon Musk Right?,” *The Guardian*, June 2, 2016, <https://www.theguardian.com/technology/2016/jun/02/self-driving-car-elon-musk-tech-predictions-tesla-google>.

¹²⁷ The Tesla Team, “All Tesla cars Being Produced Now Have Full Self-Driving Hardware,” Oct. 19, 2016, <https://www.tesla.com/blog/all-tesla-cars-being-produced-now-have-full-self-driving-hardware%20>.

¹²⁸ *Ibid*.

regarding his company's ability to achieve full technological autonomy employs a combination of hyperbole, exaggeration, and showmanship. When Musk predicts a Tesla car will make an autonomous cross-country trip entirely independent of human operation by the end of 2017,¹²⁹ or declares SpaceX will enable human transport to the planet Mars by 2024,¹³⁰ he exudes a combination of guileless charm and promotional bravado that combine with his engineering and business pedigree to command attention, credibility, and a sense of wonder around a utopian technoscape peeking above a near-future horizon. In this sense, when Musk describes "full autonomy" as Autopilot's ability for complete vehicular operation, the explicit application of "autonomy" to describe his company's intellectual property undergirds implicit notions of full autonomy embedded in this discourse and concomitant notions of human freedom rendered unchecked by full-on technological control.

By positing full technological autonomy as a paradigm poised to render enhanced safety, affordability, and mobile accessibility, Musk's explicit reference to full technological autonomy imbeds notions of fully-realized autonomy for humans seeking transport in Autopilot-powered Tesla cars. For Musk, the ascent and realization of technological autonomy positively correlates with human autonomy and further positively correlates with the ability for Autopilot and human beings to exercise control. Where Autopilot's full technological autonomy corresponds to the technological convergence of automated connectivity, computer programming, and automotive engineering, Musk's implicit references to human autonomy correspond to aspects of cultural convergence (note: henceforth, I use "convergence" to refer

¹²⁹ Musk initially announced his intention for a Tesla car to drive across the United States in late 2017. As that date approached, Musk acknowledged the failure to deliver on his promise, and subsequently moved the date of the cross-country autonomous feat to mid-2018. See: Darrell, Etherington, "Elon Musk expects to do coast-to-coast autonomous Tesla drive in 3 to 6 months," *TechCrunch*, Feb. 7, 2018. <https://techcrunch.com/2018/02/07/elon-musk-expects-to-do-coast-to-coast-autonomous-tesla-drive-in-3-to-6-months/>.

¹³⁰ Dave Mosher, "Elon Musk revealed a new plan to colonize Mars with giant reusable spaceships – here are the highlights," *Business Insider*, Sep. 29, 2017, <http://www.businessinsider.com/elon-musk-iac-mars-colonization-presentation-2017-9>.

to convergence culture and otherwise specific “technological convergence” when I intend its usage) re-wiring and reworking social norms, logics, and presiding frameworks for conceptualization cultural significance, especially in the context of control. If convergence pulls together “participants who interact with each other according to a new set of rules that none of us fully understands,”¹³¹ Musk’s use of “full autonomy” attempts to write the “rules” for how fully technological autonomy is culturally received as a boon for human safety, economic viability, and access to cultural goods and services. Significant to this cultural reception is the way Musk’s “full autonomy” upturns cultural notions of autonomous technology as a harbinger of suppressive control wrought by advanced technologies that have slipped the controlling grasp of human beings.

In Langdon Winner’s conception, autonomous technology is a philosophical framework for cultural anxieties “haunted by the fear that somehow technology has “run amok,” is “no longer guided by human purposes,” is “self-directing,” or has “escaped all reasonable limits.”¹³² Prior to the widespread contemporaneous application of autonomy to describe technological performances and designations of automated vehicles (and other highly-automated technologies), the “autonomous” in “autonomous technology” did not describe any particular technology or technological ability and, instead, represented an cultural fear about technological operation breaking from human control and asserting its own purposive direction independent of human purposes. This notion of autonomous technology as “out of control” is redirected by Musk’s usage of “full autonomy,” as a fully-autonomous car’s ability to *fully control* all vehicular functions is a source of relief, assurance, and newfound possibilities for human beings, as Musk’s “full autonomy” provides assurances of bodily, economic, and social vitality positively correlating with increasing technological autonomy until fully-automated vehicles enable humans to likewise enact

¹³¹ Jenkins, Henry. *Convergence Culture: Where Old and New Media Collide* (NYU Press, 2006): 3.

¹³² Langdon Winner, *Autonomous Technology*, 13.

unrealized autonomous capacities. If, as a cultural anxiety, autonomous technology is “ultimately nothing more or less than the question of human autonomy held up to a different light,”¹³³ “full autonomy” is Musk’s answer to this question, casting human autonomy in the warm glow of Musk’s illuminated conception of Autopilot as the harbinger of heretofore unrealized individual, social, and economic autonomy, recalibrating and reorienting the traditional notion of autonomous technology as cultural anxiety towards a contemporary notion of autonomous technology as the source of relief from overlapping socio-economic anxieties.

Where convergence locates the cultural significance of technologically-convergent systems at destabilized and dissolved borderlines between producer and consumer (both as terminological constructs and aggregated groupings) and what this portends for social power,¹³⁴ Musk situates “full autonomy” as social power, simultaneously destabilizing and dissolving cultural anxieties around autonomous technology while reconstructing cultural implications as diametrically oppositional to the deleterious consequences proffered by “out of control” narratives and fears. If emerging media and technological paradigms are best understood not just through transitional definitions and redefinitions of “production” and “consumption” (and related terms), but by intricately understanding “the whole social context within which production and consumption get defined,”¹³⁵ Musk attempts to redefine “full autonomy” by redefining the social context, placing Autopilot’s autonomous capabilities as a palliative to anxieties about technological control, social ills, and material barriers to human autonomous potential. Musk, in other words, leverages “full autonomy” to control the social context for how Autopilot’s full vehicular control will enable humans to more fully control the circumstances of everyday life, alongside generat-

¹³³ Winner, *Autonomous Technology*, 43.

¹³⁴ Henry Jenkins, *Convergence Culture*, 2006.

¹³⁵ Lisa Gitelman, *Always Already New. Media, History, and the Data of Culture* (MIT Press, 2006): 15.

ing consumer goodwill for Autopilot, Tesla, and Musk. Redefining this social context rests on Musk's ability to render "control" synonymous with "freedom" as readied by technological autonomy, a dynamic best understood through the lens of Wendy Chun's "control-freedom."

Similar to the way in which convergence emphasizes recalibrations to traditional couplings of "producer" and "consumer," Wendy Chun's concept of "control-freedom" enjoins "control" and "freedom" to stress the imbricated relationship between their conceptual and lived parameters, primarily in the context of politics and digital technology. Chun argues for the mass inception of the internet as the example *par excellence* of a politically and technologically structured power, a control-freedom that "subverts the promise of freedom" yet "does not forever render freedom innocuous, for if anything cannot be controlled it is freedom."¹³⁶ For internet users and a culture increasingly prone to experience social life as digitally-mediated, control-freedom's recombinant logics gesture towards the possibilities for human autonomy to be alternately enlivened and restricted: "the forms of control the Internet enables are not complete, and the freedom we experience stems from these controls; the forms of freedom the Internet enables stem from our vulnerabilities, from the fact that we do not entirely control our own actions."¹³⁷ In addition to the inextricable relationship between control and freedom supposed by control-freedom, autonomy also enmeshes with control and freedom to reinforce and influence how each are understood and experienced. Winner notes autonomy is a "political or moral conception that brings together the ideas of freedom and control,"¹³⁸ while Alfred Mele situates self-control of reasoning, intent, and action as the primary condition for the ontological basis of human autonomy.¹³⁹ But where Chun's

¹³⁶ Chun, Wendy Hui Kyong. *Control and Freedom: Power and Paranoia in the Age of Fiber Optics*, (MIT Press, 2008): 1-2.

¹³⁷ *Ibid* 3.

¹³⁸ *Ibid* 16.

¹³⁹ More specifically, under Mele's model, an individual is considered autonomous when capable of exercising control across four junctures: a "psychological basis for evaluative reasoning"; the use of this reasoning to form a judgement that "recommends a particular course of action"; an intent to act based on this judgment; and an action that executes this intent. Mele, Alfred R. *Autonomous Agents: From Self-control to Autonomy*. (Oxford University Press on Demand, 2001): 13.

control-freedom convincingly situates the entanglements and limitations of human control and freedom amidst imposing power structures of digital connectivity, Musk's "full autonomy," oversimplifies this relationship, as his positive correlation of technological autonomy with human autonomy presupposes the latter as emerging via control *as* freedom and freedom *as* control.

Per Musk's conception, when Autopilot exercises totalized vehicular control, humans experience the freedom to control their activities during transport, opening up self-determining capacities undergirding the enactment of human autonomy. Musk situates Autopilot control as synonymous with human control which is synonymous with human freedom – this, for Musk, is how full autonomy emerges for humans amidst Autopilot-powered transport. If, for Chun, control-freedom is a recombinant struggle for power wherein power must continually be questioned as a source of possibility for control of freedom, Musk's "full autonomy" is all-empowering control and freedom, for all facets of life – for individual humans, for cultural life, for social arenas, and for Tesla and Musk once the aggregate of these paradigms recognizes Autopilot as an agent of human autonomy. Despite these limitations, however, the cultural uptake of "autonomy" to describe Autopilot and other highly-automated vehicles reflects Musk's ability to ideological situate "full autonomy" as the alignment of mutually-beneficial industrial drives and consumptive empowerment. In other words, his use of "fully autonomy" is an ideological usage in which the power dynamics of cultural convergence are flattened into an egalitarian autonomy between Tesla and would-be Autopilot passengers.

2.7 Musk's Ideology of Autonomy

While the term "ideology" has a general usage indicative of a system of idealized beliefs guiding intention and action, my usage here invokes ideology as used in critical theory and media studies to indicate a cultural power construct exerting and inducing control through its embeddedness in political, economic, and technological systems. Ideology is best understood via Louis Althusser's definition of ideology as "a 'representation' of the imaginary relation of individuals to their real conditions of existence.

¹⁴⁰ Even though convergence is not necessarily an ideology *per se*, its claims about digital systems and the ability to recuperate social power by enlivening user control and diminishing corporate control make it susceptible to ideological mystifications. In addition to stressing the increasing inadequacy of “producers” and “consumers” to describe who makes media, accesses media, interacts with media, and exercises power through media, convergence also speaks to the convergence of industrial interests and pro-social outputs, a convergence with a built-in allure for the workings and reception of ideology.

Noting the productive capacities of consumers empowered to craft and influence industrial media products, Mark Deuze describes convergence as a “mechanism to increase revenue and further the agenda of industry, while at the same time enabling people...to enact some kind of agency regarding the omnipresent messages and commodities of this industry.”¹⁴¹ Control and freedom are central to this mechanized approach. Convergence “signifies increased as well as diminished corporate control over the creative media process,”¹⁴² as the shift from closed mass media consumption to open digital systems built on creative and participatory interaction endowed consumers with productive capacities traditionally accorded to industry and its gatekeepers. Where industry cedes degrees of control to users granted freedoms to shape media forms, objects, and systems, this ceding of control is, on one hand, a loss of corporate power and recuperation of social power and, on the other hand, a corporate strategy for marshalling the freedoms of productive users towards economic boons that are the sole province of industrial coffers. Thus, even if Jenkins, Deuze, and other scholars recognize convergence as “both a top-down-corporate-driven process and a bottom-up consumer-driven process,”¹⁴³ they also recognize

¹⁴⁰ Louis Althusser, “Ideology and Ideological State Apparatuses (Notes Towards An Investigation),” in *Lenin and Philosophy and Other Essays*, trans. Ben Brewster (New York: Monthly Review Press, 1971): 162.

¹⁴¹ Deuze, Mark, “Convergence Culture in the Creative Industries,” *International Journal of Cultural Studies* 10, no. 2 (2007): 247.

¹⁴² *Ibid* 249.

¹⁴³ Henry Jenkins and Mark Deuze, “Editorial – Convergence Culture,” *Convergence: The International Journal of Research Into New Media Technologies*, 14 no 1 (2008): 6.

power and control remains mostly vested among corporations even if consumers have more freedom to manipulate and access media systems.

Autopilot’s “full autonomy” is freighted with an ideological weight that flattens corporate and social power vestings into an egalitarian conception of autonomy equally at hand among Tesla, Autopilot, and passengers in Tesla cars. In addition to Musk reworking cultural fears of technological autonomy by touting the safety, financial, and social benefits of Autopilot’s “full autonomy,” Tesla corporate discourse situates notions of human autonomy around a similar sense of cultural relief that demonstrates the ideological workings of Autopilot’s full autonomy. Tesla corporate blog posts repeatedly tout the ability of Autopilot to “relieve drivers of the most boring and potentially dangerous aspects of road travel.”¹⁴⁴ While this quote shares many similarities to Musk’s use of “full autonomy,” the “relieve drivers” either approximates or directly precedes the material reality faced by drivers of pre-autonomous Autopilot-powered cars: “the driver is still responsible for, and ultimately in control of, the car.”¹⁴⁵ Per Althusser, Tesla’s ideology represents human autonomy – under the aegis of “driver relief” – as an imaginary relationship with real technological conditions, as potential Autopilot consumers are induced to imagine human autonomy emerging out of a technological system that does not yet bear the technological and legal conditions for vehicular autonomy. Concomitantly, this representation posits an imaginary relationship between the consumer and Tesla born from suppositions of egalitarian power in convergence, wherein Tesla accrues power in the form of economic capital while consumers accrue power through the would-be ability to relinquish vehicular control and exercise freedoms otherwise unattainable.

¹⁴⁴ See: “Dual Motor Model S and Autopilot,” Tesla Motors, Oct. 10, 2014, <https://www.tesla.com/blog/dual-motor-model-s-and-autopilot>; “Your Autopilot Has Arrived,” Tesla Motors, Oct. 14, 2015, <https://www.tesla.com/videos/enhance-your-commute-autopilot>; “Enhance Your Commute With Autopilot,” Feb. 4, 2016, <https://www.tesla.com/videos/enhance-your-commute-autopilot>; “Dual Motor Model S and Autopilot,” Oct. 10, 2014, <https://www.tesla.com/blog/dual-motor-model-s-and-autopilot>.

¹⁴⁵ “Dual Motor Model S and Autopilot.”

In this sense, ideology is cultural information that “constitutes our interests and works against them,”¹⁴⁶ inducing social absorption and internalization of ideological norms about how Autopilot and Tesla can foster social and individual autonomous potential even as its economic strivings cleave at this potential. But where an Althusserian reading illuminates the representational facilities of ideology, Wendy Chun a way of understanding how ideology operates through Autopilot. For Chun, computers are “ideology machines” that mimic and simulate ideology, operating through the “externalization of our beliefs onto objects that act for us,” be it beliefs built about autonomy and control built into Autopilot or beliefs about how Autopilot should carry out technological control functions that enable human autonomy to emerge from newfound vehicular freedoms.¹⁴⁷ The use of “autonomy” by Musk and Tesla is therefore incomplete, inadequate, and ideologically compromised, even as culture at large is far more apt to use “autonomy” and “autonomous” to describe highly-automated vehicles and this usage persists as a shorthand to describe the stratification of automated operation and human control outlined in the FAVP. Having demonstrated why the popular usage of “autonomy” is inadequate, I move now to assess the complications of autonomy arising from FAVP stipulations, beginning with a continued focus on ideology amidst the differentiation of technological performance, human control and freedom, and autonomous potential.

2.8 FAVP Levels of Automation and Political Ideologies of Autonomy

The FAVP is primarily concerned with “automation” as a terminological construct applied to vehicles and driving performances, with only tangential references to “autonomy”, as this latter term appears only a few times in the text of the policy amidst direct quotes from external sources and in refer-

¹⁴⁶ Jack M. Balkin, *Cultural Software: A Theory of Ideology*, (Yale University Press, 2002): x.

¹⁴⁷ Chun, *Control and Freedom*, 19; 21.

ence to the State of California's regulatory form for automated vehicles testers, "Report of Traffic Accident Involving an Autonomous Vehicle (form OL 316)."¹⁴⁸ FAVP's recommendations encompass technological design and regulatory scope across four areas: Vehicle Performance Guidance; Model State Policy; NHTSA's Current Regulatory Tools; and New Tools and Authorities."¹⁴⁹ One of the most significant aspects of FAVP is its adoption of the Society for Automotive Engineers' International (SAE) levels of automation. While the next subsection will focus on contestations around the creation of these levels, accompanying terminology, and implications for human and technological autonomy prior to FAVP adoption, I will first focus on the formal federal adoption of these levels and how their stratification of technological and human control imposes ideological notions of human autonomy.

Even though "automation" and "automated" describe varying degrees of technological technique, their usage in this context do not fully signify the varying degrees of political ideologies, human strivings for freedom and control engrained in these ideologies, and ideological predispositions for material realities around technological design and function that anticipate the cultural reception and significance of Autopilot and other highly-automated technologies. My mobilization of "autonomy," as embedded in and emerging from these dynamics, more precisely invokes this significance, while also adding depth and clarity to "autonomy" as a means of reworking and reinvigorating a popular tendency by Musk and other cultural actors to attach misguided notions of "autonomy" to automated cars more so than most other automated technologies and automated performances. In other words, I de-privilege the popular usage of "autonomy" in relation to Autopilot and other automated vehicles and give privilege to a more nuanced conception of autonomy emerging from aspects of automated control and human freedom. This nuanced conception includes FAVP's differentiation of automated vehicular control and human interaction with these differentiated levels.

¹⁴⁸ "Federal Automated Vehicles Policy," 81.

¹⁴⁹ Ibid.

The SAE levels of automation encompass six distinct levels based on when control is exercised by automated operation, human operation, or some combination of the two. The levels range from “0” (zero) to “5.”¹⁵⁰ At level zero, the human controls all driving functions and monitoring of environmental and vehicular conditions. Beginning at levels 1 and 2, the “automated system” controls some aspects of driving, even though the driver controls most driving and monitoring functions. At level 3, the human can relinquish some control, under particular conditions, to the automated system, which, at level 4, can take full control under certain conditions. At level 5, all driving tasks, under all conditions, can be performed by the automated system. FAVP defines an “automated system” as a “combination of hardware and software...that performs a driving function, with or without a human actively monitoring the driving environment.”¹⁵¹ While all levels refer to this type of system, the term “highly-automated vehicle” corresponds to level 3-5 vehicles “with automated systems that *are responsible for monitoring the driving environment.*”¹⁵² Per FAVP’s designation, Autopilot’s automated capabilities are conceived in this context as both the *ability* to perform a driving function (levels 1 and 2), and the *responsibility* to monitor driving conditions (levels 3-5), wherein the latter may also assume responsibility for controlling many or all driving functions. Beyond demarcating automated function, FAVP’s adoption of SAE levels legitimates and transmits ideological assumptions about “who does what, when,”¹⁵³ including who (Autopilot or humans) must exercise control, what types and degrees of control are assumed, and when they can be freed or enabled to control driving functions. These levels of automated performance are therefore also layered with ideological assumptions about when, how, and under what circumstances human autonomy can flourish or diminish as aligned with technological control. Across these layers, ideology models how human autonomy should be understood and experienced.

¹⁵⁰ “Federal Automated Vehicles Policy,” 10.

¹⁵¹ Ibid 10.

¹⁵² Ibid 10.

¹⁵³ Ibid 8, via “SAE Taxonomy,” www.sae.org/misc/pdfs/automated_driving.pdf.

My use of “models” gestures towards Alexander Galloway’s notion that “ideology gets *modeled* in software,”¹⁵⁴ as opposed to analogous relationships positing ideology as the seat of power placed into software or software as a vessel that transports ideological will from one point to another. Chun moves in this direction when she cautions against flattening ideological operation into software performance, as to do so “elides the difference between software as code and software as executed program,” and therefore “suppresses the question of power, central to any serious study of ideology.”¹⁵⁵ Here, she stresses the differentiation between software as bundles of inert text (i.e. computer code) and software as active performance(s) when this text executes. Software is, in this sense, a differentiation of what is possible and what must transpire, not unlike the possibility of software control and the necessity of human control among FAVP automated systems (SAE levels 1-2) and the increasing necessity of software control and human freedom from necessary control among ascending levels of HAVs (SAE levels 3-5). Following from this logic, ideology is modeled within FAVP stipulations as a permeating force across layers (Autopilot code and performance, degrees of Autopilot and human control, SAE levels) that differentiates ideological notions of autonomy.

On one hand, possibilities for human autonomy can enlarge alongside the increasing necessity of Autopilot control. On the other hand, these possibilities transpire only within the auspices of policymaking and scientific expert consensus for when, how, and under what circumstances humans should be “free” to make determinations about vehicular control, situational awareness, and passive occupation of Autopilot-powered cars. Furthermore, any enhanced possibilities for human autonomy must be understood not as an ever-increasing one-way ascension, but as a conditional circumstance afforded only during particular circumstances subject to change and fluctuate. At SAE level 4, for instance, passengers

¹⁵⁴ Galloway, *Interface Effect*, 52. [italics in original]

¹⁵⁵ Chun, *Control and Freedom*, 22.

“need not take back control,” even though the automated system can only operate “in certain environments and under certain conditions.”¹⁵⁶ Even at the highest levels of automation, humans are never free from the possibility of being snapped back into vigilance and operational control, as the conditional circumstances of automated control correspond to a provisional autonomy in which human autonomy is conditional at all levels, alternately potentialized and restricted by ideological notions of control enmeshed among policymaking bodies, legal encoding, technological performance, and human-machine purview. In this respect, the provisioned autonomy imposes an ideological force that differentiates between “inert” and “active” performance, an attempt to model in human beings normative ideas about compliance to state and technological control. This dynamic, however, should not be misconstrued with a vulgar Marxist stripe, as the claim here is not a simplistic notion of control as emanating from the state and heaved onto unwitting masses. Instead, taking seriously Chun’s recognition of ideology as a power struggle, it’s important to consider the ideological battles waged among policymakers and political power brokers, particularly the ways notions of autonomy factored into policy machinations preceding FAVP’s formal release. The most fruitful area for unpacking this next facet is the contestation over the use of - and relationships between - “autonomy” and “control” and “driver” and “user” as appears in the early formations of SAE levels and corresponding language of political power struggles preceding FAVP.

2.9 Political Power and the Modulation/Modularity of Autonomy

The SAE levels of automation precede FAVP adoption. Just as these levels are highly significant to FAVP (and automated driving more generally), preceding policy machinations reveal political struggles over how to designate within these levels the status and activities of humans occupying automated vehicles, the nature of human operation, technological control and autonomy, and the way these struggles shift conceptions and opportunities for the autonomy of Autopilot passengers. While the FAVP is the

¹⁵⁶ “Federal Automated Vehicles Policy,” 10.

first attempt to formalize federal recommendations for automated vehicle policy, regulation and design, two successive attempts to ignite the consensus-building process leading to FAVP wrestled with specificities of FAVP levels and corresponding terminology. These documents – a 2013 Department of Transportation (DOT) Statement of Policy (henceforth: 2013 DOT Statement) and the 2014 Society of Automotive Engineers International (SAE)'s *Taxonomy and Definitions for Terms Related to Driving Automation Systems for On-Road Motor Vehicles* (henceforth: 2014 SAE Taxonomy) – initiated a process of contested terminology, foci, and functionality germane to both human operation of an automated vehicle and the vehicle's technological capability. Among these contestations, differing designations and applications of “automated,” “autonomous,” “control,” “driver,” and “user” reveal conflicting ideas as to the focal point of policy frameworks (vehicles or drivers), when (and if) drivers should be considered “users,” distinctions among degrees of automated technique, and control as technological functionality, human operation, and gauge of human autonomy.

Here, my primary claim orients around the modulation and modularity of policy stipulations, technical and terminological designations for humans and automated technique, and driving roles and activities accorded to humans. Modulation is the ability to induce change by exerting control. Change, in this sense, is not necessarily a totalized transition from one state to another. In radio, for example, the properties of transmitted signals are modulated to enable information to be encoded and received. Even as some properties undergo change, carrier signals maintain their wholistic designation. In this way, modulation is a process of change and retention, a characteristic it shares with modularity. Modularity is the ability to separate and recombine the components of a larger whole. This is also a process of change and retention, as the larger whole changes from a totalized unit to a series of discreet units that retain the ability to reform into the larger whole. Beyond their general usage, these concepts are also important to

digital affordances,¹⁵⁷ technological and social control,¹⁵⁸ and human autonomy among systems and processes of networked peer-to-peer production.¹⁵⁹ In conjunction with convergence theorists, my aim is to demonstrate the way human roles and autonomous potentials are modulated through policy struggles transpiring across 2013 DOT Statement and 2014 SAE Taxonomy and become modular components among a higher-order notion of automated and political control. Thus, I illuminate the ways autonomy is subject to continual change and retentions along lines of human and technological control, rather than being inert and at rest. Likewise, this situates FAVP amidst transitional political formations, aiding an understanding of FAVP and what it portends for autonomy as subject to continued change and recomposing.

Across the 2013 DOT Statement and 2014 SAE Taxonomy, differing levels of automation were offered by respective institutions, as the DOT outlined levels 0 – 4 of automated driving in its 2013 Statement, while SAE included in the 2014 Taxonomy the levels of automation later adopted by FAVP. Across these documents and their respective levels of automation, policymakers modulated the application of “autonomy” and “control” to describe both technological function and human operation, as well as the application of “driver” and “user” to describe the roles of human interactions with automated vehicles. The 2013 DOT Statement uses “autonomy” when asserting the need to determine the operational parameters for its level 2 and 3 range, as such parameters can “help determine the level of autonomous authority that the vehicle is capable of achieving.”¹⁶⁰ SAE demurs against using this term in its levels of automation, as “autonomous” is (alongside “control”) what the SAE dubs a “depreciated term.” Depreci-

¹⁵⁷ Lev Manovich, *The Language of New Media*, MIT Press, 2001; Rob Kitchin and Martin Dodge, *Code/Space: Software and Everyday Life*, MIT Press, 2011.

¹⁵⁸ Gilles Deleuze, "Postscript on the Societies of Control," *October* 59 (1992): 3-7.

¹⁵⁹ Yochai Benkler, *The Wealth of Networks: How Social Production Transforms Markets and Freedom*. Yale University Press, 2006.

¹⁶⁰ *Taxonomy*, 9.

ated terms are those that SAE recommends against using in policy language because they are “functionally imprecise” and “frequently misused.”¹⁶¹ The Statement is careful to note the reliability of this term when suitably applied by robotics and artificial intelligence researchers, but recommends against its application to automated driving since popular discourses inaccurately apply “autonomous” to varying degrees of automation (including “vernacular usages” equating autonomy with automated driving); the term obfuscates the extent to which the vehicular operation may depend on entities external to the vehicle (such as remote operation); and, self-governance, as an innate condition of autonomy, does not apply to automated driving systems, since such systems function by obeying algorithmic command and the “commands of *users*.”¹⁶²

“Control” is also a depreciated term in the 2014 SAE Taxonomy, despite DOT’s privilege of “control function” as the primary criteria for designating a vehicle “automated” (based on how automation controls aspects of driving, rather than merely performing such aspects). Since its “numerous technical, legal, and popular meanings” do more to confuse than to clarify, by SAE standards “control” is insufficient to describe the roles of automated technological function and human activity. Furthermore, negating the act of control (as in “the driver does not take control”) is especially problematic for SAE, as this usage could “unintentionally and erroneously suggest the loss of all human activity.”¹⁶³ While FAVP ultimately adopts SAE’s resistance to the use of “autonomy,” FAVP demonstrates a more complicated relationship with “control,” as the term does not apply to technological function in FAVP levels, but is used to indicate whether or not a human must “take back control” at level 3 or 4, as well as more casual AVP references to human “control actions” or “control transition” from the vehicle to the human operator.¹⁶⁴

¹⁶¹ Ibid 26.

¹⁶² Ibid 26 [italics in original].

¹⁶³ Ibid 27.

¹⁶⁴ “Federal Automated Vehicles Policy,” 10; 12; 23.

SAE pinpoints a dynamic of control among definitional criteria and its connotations as both a technological and political technique. In *The Control Revolution: Technological and Economic Origins of the Information Society* (1989), James Beniger argues for a tightly-woven relationship between contemporary technological and social control emerging out of a longitudinal process of industrial development and exploitation of information technologies dating back to the mid-19th century. He notes that “control encompasses the entire range from absolute control to the weakest and most probabilistic form...any purposive influence on behavior, *however slight*.”¹⁶⁵ As informational processing and communicative reciprocity underpin this broad conception of control, “society’s ability to maintain control...will be directly proportional to the development of its information technologies.”¹⁶⁶ For SAE, “control” is too broad to appear *anywhere* in approximation to human or technological activity, yet for Beniger control is too broad to ignore as it exerts itself *everywhere* in a society increasingly animating technologies and social paradigms with informational-processing capacities of digital automation. SAE, however, is exclusively concerned with technological control, and the scope of Beniger’s definition and societal scale gets us closer to understanding how SAE and DOT modulate autonomy along lines of technological, social and political control. Where Beniger typifies techno-social control at its scale of exertion, Gilles Deleuze’s “societies of control” looks beyond scale to emphasize modulation as critical to contemporary techno-social control.

Advancing from a Foucauldian concept of control administered by sovereign powers in enclosed disciplinary societies, Deleuze argues for control as a “modulation, like a self-deforming cast that will continuously change from one moment to the other, or like a sieve whose mesh will transmute from

¹⁶⁵ Beniger, *The Control Revolution*

¹⁶⁶ *Ibid* 8-9.

point to point,” a process of change indicative of “short-term and rapid rates of turnover, but also continuous and without limit.”¹⁶⁷ Thus, SAE’s 2014 Taxonomy is not just a response to the 2013 DOT Statement, but a modulation of “control” and “autonomy” as terminologically important, a modulation of human autonomy in accordance with this importance, and a modulation of political power attempting to exert control over legal and social conceptions of how human autonomy can be potentialized in Autopilot-powered cars.

Across the depreciation of “autonomy” and “control” from 2013 DOT Statement to 2014 SAE Taxonomy, “autonomy” as a terminological designation is modulated from sparing usage to a null state. Beyond this explicit reference to technological autonomy, embedded notions of human autonomy are modulated in two key ways. First, the nullification of technological “autonomy” is predicated on human autonomy to determine (i.e. “command”) when and how automated and algorithmic processes should execute. Second, the depreciation of “control” hinges on this determination, as its plurality of meanings is conceived as a stopgap for humans to reliably undertake autonomous decision-making and reasoning capacities for driving, usage, and situational awareness. Furthermore, and with respect to Beniger and Deleuze, the societal importance of autonomy is modulated across individual and societal lines, as SAE implicates self-governance as a socially-recognized “innate” quality of autonomy among humans, while contextualizing this quality in the individual act of automated vehicle transport and operation. Thus, autonomy is modulated from a technological condition to a human condition, modulated across differing levels of automation and their concomitant designations of “control,” and modulated across individual potential for self-determinative action and social understandings of self-determination as foundational to human autonomy.

Pulling from this latter point, human autonomy is both modulated and situated as a modular component. Autonomy as a social conception predicated on self-determination is cleaved into individual

¹⁶⁷ Deleuze, “Societies of Control,” 4-5.

acts of autonomy wherein the aggregation of these individual acts recombines to both constitute and affirm a wider recognition of human autonomy. Allegorizing foundational conceits of autonomy with Lev Manovich's foundational attribution of modularity as the "fractal structure" of digital media,¹⁶⁸ the relationship between individual autonomous acts of automated vehicular interactivity and recombinant digital media forms both represent "discreet samples...assembled together into larger scale objects."¹⁶⁹ But where computer users assemble media forms into larger wholes that retain fractal elements, the assemblage and disaggregation of human autonomy by political power brokers calls into question how human autonomy can be retained when its potential – in the context of Autopilot and other automated vehicular interaction – is the purview of legislative bodies. Under certain conditions, however, human autonomy flourishes at points of compartmentalized interaction with digital technology.

Yochi Benkler notes that among individuals participating in networked peer production, an individual "maximizes their autonomy" when a close correspondence occurs between a module independent of the larger digital whole and the ability of the human to work independently on this module.¹⁷⁰ Under Benkler's conception, human autonomy enlarges at the micro level. As modulated across the 2013 DOT Statement and 2014 SAE Taxonomy, human autonomy is tightly regimented as a condition subject to the shifting winds of policy brokerage wrestling with the application and qualification of technological control and shifts in the way such brokers exercise control over such applications and qualifications. Unlike Benkler's conception, the maximization of human autonomy at the micro level is not a given, as the modular nature of human autonomy amidst SAE and DOT contestations does not attain the independence of Benkler's socio-techno arrangement of networked peer production. A further shift between the 2013 DOT Statement and 2014 Taxonomy reveals a modulation of human autonomy in accordance with

¹⁶⁸ Manovich, *The Language of New Media*, 30.

¹⁶⁹ Ibid 30.

¹⁷⁰ Benkler, *The Wealth of Networks*, 100.

the aforementioned notion of Autopilot and other HAV passengers as “users,” a modulation of human autonomy amidst intertwined notions of control, driving, and usage.

2.10 Human Autonomy: The Quandary of Modulating Cultural Activities

In the 2013 DOT Statement, each level of automated driving designates roles and functions expected of the “driver.” The 2014 SAE Taxonomy, however, complicates the notion of a “driver.” With respect to the operations of driving tasks, SAE levels are grouped between driver-performed¹⁷¹ tasks (level 0 – 2) and the performance of sustained driving tasks by the automated driving system¹⁷² (ADS) (level 3 – 5). At Level 3, when the ADS becomes the primary performer of driving tasks, the (human) driver transitions to a “user.” At this level and subsequent levels, the user is “receptive to ADS-issued requests to intervene,” (level 3), not expected to respond to such requests (Levels 4 and 5).¹⁷³ The notion of a “driver” is one of four terms describing the driving tasks performed by a human *user*: driver, passenger, DDT fallback-ready user¹⁷⁴, and dispatcher.¹⁷⁵ The driver performs all or part of the driving tasks, the passenger is present in the vehicle (never remote to the vehicle) but does not have a role in vehicle operation, the DDT fallback-ready user is able and ready to operate and intervene when requested by the ADS, and the dispatcher affirms the vehicle’s operational readiness and engages or disengages the ADS.¹⁷⁶ Since the 2014 SAE Taxonomy notes that user roles do not overlap and often occur in sequence, the transition from “driver” to “user” across the 2013 DOT Statement and 2014 SAE Taxonomy modulates human autonomy along lines of driving, usage, and control (or lack thereof) as the means for human autonomy.

¹⁷¹ “Performance” – alongside “operation” - is SAE preferred parlance for more precisely accounting for the actions undertaken by both human and the ADS. “Performance” and “operation” replace the Statement’s dependence on “control.”

¹⁷² An ADS refers to the converged software and hardware capable of performing sustained driving tasks.

¹⁷³ *Taxonomy*, 17.

¹⁷⁴ DDT is Taxonomy acronym for “dynamic driving tasks,” defined in as the tasks necessary to “*operate a vehicle* in on-road traffic.”

¹⁷⁵ *Ibid* 14.

¹⁷⁶ *Ibid* 14-15.

When considering the transitional relationship between “drivers” and “users,” it’s important to first situate driving as an act socially connected with human autonomy. In a recent essay unpacking social and cultural contexts of automated driving, Fabian Kroger notes: “the promise of automotive autonomy has historically rested primarily on human drivers’ control of the gas pedal, steering wheel and brakes. Steering a car is the only area where the love of power and imagination still has free rein” one that offers refuge from an “increasingly controlled and managed society.”¹⁷⁷ Autopilot and other highly-automated vehicles hold the potential to diminish the autonomy of human drivers increasingly relegated to passengers or “users” of a technological system wherein human interaction bears more resemblance to computational input than automotive control. In the modulation of “drivers” to “users,” human autonomy is afforded and restricted in accordance with social dispositions for driving as a cultural activity and the convergence of other cultural activities through the transformative to automotive space.

The transition from “driver” to “user” is not only a move away from the cultural activity of driving and its autonomous potential, but a move towards the “user” as an agent exercising somewhat different possibilities for human autonomous potential. In this context, “user” is a term among convergence and digital media theorists that offer heightened degrees of self-determination as opposed to “audiences” and “consumers.” P. David Marshall describes the transition from an “audience-subject” to “user-subject” as a key development in the relationship between self-personalization offered by digital media systems and way such personalization is prefigured by industrial progenitors. Citing cultural convergence as a phenomenon upturning traditional demarcations and power dimensions among producers, audiences, and consumers (among other categorizations), Marshall describes the ability for consumers to personalize digital media technologies as a technique that “hails the individual to see themselves producing their

¹⁷⁷ Kroger, Fabian. “Automated Driving in Its Social, Historical, and Cultural Contexts.” In Eds. Maurer, Markus, J. Christian Gerdes, Barbara Lenz, and Hermann Winner *Autonomous driving*. Springer Berlin Heidelberg, Berlin, Germany (2016): 41.

cultural activity.”¹⁷⁸ Whereas historical models of consumption prefigured audiences as amalgamations of individuals subject to fixed consumptive parameters of media systems, objects and content produced by industry, the rupturing of this fixity through modifiable digital techniques means that audiences become empowered to actively engage with media to such an extent that media *usage* more aptly describes consumptive patterns and activities.¹⁷⁹ Likewise, Philip Napoli’s “audience autonomy” preserves the use of “audience” yet signals to the underlying logics of how users experience greater personal autonomy through technological control, as “the contemporary media environment provides audiences with unprecedented levels of control over not only what media they consume, but also when, where, and how they consume it.”¹⁸⁰ Conceptually, “users,” and its underlying logics interweave with the way users might issue commands to Autopilot in accordance with driving or navigational preferences, as well as the way Autopilot modulates reconfigured cultural and spatial practices in Tesla and other highly-automated vehicles.

As conceived by Rob Kitchin and Martin Dodge, software such as Autopilot “modulates how space comes into being,” wherein space is understood not as a fixed or contained demarcation of area but, instead, an “event or doing – a set of unfolding practices that lack a clear ontology.”¹⁸¹ Through this

¹⁷⁸ Philip D Marshall, “New Media as Transformed Media Industry” in *Media Industries: History, Theory, and Method*, eds. Jennifer Holt and Alissa Perren (Wiley: 2009): 84.

¹⁷⁹ To be more precise, and guard against interpretations of technological determinism, it’s important to note strands of scholarship (particularly among cultural studies, media reception, and critical theory) that evidenced various degrees of audience activity prior to the digital turn. My claim is not that audiences were passive or docile prior to digital connectivity. Instead, my evocation of the transition from audiences to users understands audiences as already increasingly active across contexts of consumption, creation, and interactivity prior to – and alongside – the uptake of digital technologies. For more on active audiences, see: Stuart Hall, “Encoding/Decoding,” in *Media and Cultural Studies: Keywords 2*, eds. Meenakshi Gigi Durham, Douglas Kellner (Blackwell Publishing: 2001): 163-173; David Morley, “Active Audience Theory: Pendulums and Pitfalls,” *Journal of communication* 43, no. 4 (1993): 13-19; John Fiske, *Television Culture*, (Routledge, 2002).

¹⁸⁰ Philip M Napoli, *Audience Evolution: New Technologies and the Transformation of Media Audiences*, (Columbia University Press, 2011): 55.

¹⁸¹ Kitchin, Rob, and Martin Dodge. *Code/Space: Software and Everyday Life*, (MIT Press, 2011): 16.

modulation – what these authors dub “code/space” - Autopilot “creates new horizons for cultural activity,”¹⁸² such as opportunities for engaged media usage when humans are not performing driving tests. One of Autopilot’s features is a “personalized media player” that enables tactile interaction with “streaming radio, live stations, and podcasts,” available via touchscreens built into Autopilot-powered Tesla cars.¹⁸³ When the 2014 SAT Taxonomy implores a redefinition of “drivers” to “users,” the latter is understood as a modulation between cultural acts of driving, cultural activities made manifest by software, and their points of collision. Viewed this way, “drivers” entails a state of “driving” or “non-driving,” while “users” speaks to the autonomous potentials of humans to engage in an enlarged series of cultural practices, be it driving, media interactivity, or a combination thereof. Nonetheless, if driving enthusiasts experience autonomy only along lines of vehicular control, the transition from “drivers” to “users” and the concomitant loss of human vehicular control is a reminder that “the interplay between people and software in diverse, complex, relational, embodied, and in context-specific ways,”¹⁸⁴ in addition to the contestations over “driver” and “users” waged by DOT and SAE. And, since DOT deferred to “drivers” in the FAVP, this subsequent modulation invokes political actors and frameworks in this interplay, as the imagined cultural significance of Autopilot, the car it powers, the spatial and cultural practices it brings to the fore, and the transmutable micro and macro conceptions of human autonomy coursing across these dynamics signifies policymaking machinations as a primary agent in the interplay among varying intensities of human autonomy.

¹⁸² Ibid 5.

¹⁸³ “Software Updates.”

¹⁸⁴ Kitchin and Dodge, *Code/Space*, 156.

2.11 Conclusion

This chapter has demonstrated the complications of human autonomy as imagined by policymakers constructing and anticipating legal recommendations for state-level policy makers and designers of automated vehicles in the FAVP and its antecedents. I begin with this chapter in order to drive towards a more nuanced conception of human autonomy amidst highly-automated vehicles possessed with the potential for technological autonomy. Elsewhere in this project, I stress a transition from automation to autonomy. Here, however, the prominent interplay of advanced automation and autonomous agency among technological systems and processes warrant an address of both autonomous and automated conditions, especially as Autopilot-powered Tesla cars and other automated vehicles display evidence of autonomous potential. Moreover, the popular imagination and early reception around highly-automated vehicles tends to deploy autonomy as a shorthand for these vehicles and cultural implications. Therefore, unique to this chapter is the necessity of urging a more nuanced conception of human autonomy that addresses questions outside the purview of autonomous agents and automated interaction as described in scientific literatures and circulated across popular arenas. In short, it was necessary to address autonomy and automation, rework them both, and conceptualize a more precise understand of human autonomy.

My approach analyzed the first formal federal policy to recommend consolidated practices for outlining regulatory scope, enacting state-level policies around highly-automated vehicles, and urging design specifications – the Federal Automated Vehicles Policy (FAVP). My analysis primarily focused on the federal adoption of SAE levels of automation in this policy as they correspond to potential regulatory, policy, and design implications. More critically, however, in their attempt to encode legal and technological designations, policymakers and scientific experts embedded shifting conceptions of human autonomy that merge out of notions of control as both a source and inhibitor of personal and social freedom. Through a methodology that situated FAVP as a discursive nodal point interconnected with preceding

attempts to anticipate and contest legal, technological, and related distinctions automation, control, and freedom that give rise to how policymakers envision and anticipate the cultural significance of automated vehicles and human transport in such vehicles. By leveraging digital media theory – particularly those concerned with convergence and software affordances – I contextualized and gave levity to how political notions of autonomy correspond to techno-socio conditions, especially around control.

Through this approach, I began by arguing for Elon’s musk conception of full autonomy on the grounds that it is indicative of cultural applications and interpretations of autonomy in relation to Auto-pilot and other automated vehicles. While this conception reworks cultural fears around autonomous technology, it is definitionally and theoretically insufficient to describe the complications of human autonomy that can emerge from rigorous analysis. From this point, I build towards a more nuanced conception of human autonomy, arguing for an ideology of human autonomy as a condition modeled in policy stipulations for technological and social control; human autonomy as a condition modulated in its intensities and opportunities by political power struggles; and modulated in accordance with implications for the intersection of driving and media usage as cultural activities transpiring during passage in automated vehicles.

3 IBM'S WATSON

For viewers of the television show *Jeopardy!* on February 14, 2011, Valentine's Day was a contest for human hearts and robotic minds. On this day, IBM's Watson took part in the first of a three-day competition with former *Jeopardy!* champions Ken Jennings and Brad Rutter. In the annals of this show's competition, Jennings and Rutter are prime contenders for the Mount Rushmore of *Jeopardy!* successes. Jennings is the record holder for most consecutive wins and second highest-earning competitor in the game's history. Rutter is the overall highest-earning competitor, and until 2011 never lost a match due to pre-2003 rules that stipulated consecutive 5-day winners must retire undefeated. He maintained his undefeated streak while competing in Tournament of Champions matches against other five-day winners in 2001, 2002, and 2005 and remained undefeated until Feb. 16, 2011, when Watson defeated both Rutter and Jennings to become the victor in the first-ever "man vs. machine" match in the show's history.

Watson is IBM's proprietary advanced computer technology that performs analytical interpretations "powered by the latest innovations in machine learning" to transform data into usable insights,¹⁸⁵ such as analyzing questions asked by Alex Trebek and generating appropriate responses. Watson's *Jeopardy!* win was widely publicized and in subsequent years became a cultural shorthand for understanding the increasing human-like intelligence of artificial intelligence (AI) as an oppositional force to human beings, amplifying a "man vs. machine" dichotomy that played out in popular culture, journalistic reportage, economic forecasting, think-tank white papers, and policymaking arenas. Interviews with IBM CEO Ginni Rometty often acknowledge the *Jeopardy!* match as a moment of vast cultural visibility and awareness of Watson and, more generally, advanced AI. In these moments, Rometty is quick to decry the dystopianism of "man vs. machine" narratives that proliferated across pop culture in the wake of Watson's

¹⁸⁵ "Watson is AI from IBM," <https://www.ibm.com/watson/about/>.

Jeopardy! victory, depictions positing the increasingly autonomous capabilities of AI as the crest of a technological wave threatening humans' intellectual uniqueness and therefore poised to undercut the biological, social, and economic vitality of human beings.

On February 28, 2011 Watson participated in an untelevised *Jeopardy!* match against two members of Congress: Democratic Representative Rush Holt and Republican House Representative Bill Cassidy. This time, however, a human emerged victorious. Holt, a physicist and former five-time *Jeopardy* champion, won the match, beating both Watson and Cassidy (now a Senator). Unlike the man vs. machine narrative that tended to follow in the wake of Watson's televised victory on February 14, 2011, the February 28, 2011 match ended in conciliatory tones, not only between humans and machine, but between IBM and policymakers. Holt noted he was "proud to hold my own with Watson," but prouder to "join IBM and other members to highlight the importance of science and math education and research and development."¹⁸⁶ Christopher Padilla, IBM's vice president of government and regulatory affairs, also emphasized the match as symbolic of more profound material possibilities, echoing Holt's call for public-private collaborations aimed at leveraging Watson and other advanced technology to "help organizations make better decisions and improve how government helps its citizens."¹⁸⁷

While the popular reception to the televised Feb. 14 Watson *Jeopardy!* victory fomented dystopian notions about advanced AI's threat to human labor and performance, the Feb. 28 match speaks to a more focused attempt by IBM to situate Watson as not only helpful to organizations and their workers, but a technology poised to embolden the citizenry by enlarging opportunities for jobs and labor outcomes beneficial to both individual workers and businesses. More importantly, this moment epitomized IBM's increasing focus on policymakers and policy itself to generate outcomes aligned with neoliberal ideologies of supply-side job creation and investment, a strategy in which IBM sought to legally encode

¹⁸⁶ Associated Press, "NJ Congressman Tops 'Jeopardy' Computer Watson," March 1, 2011, <http://philadelphia.cbslocal.com/2011/03/01/nj-congressman-tops-jeopardy-computer-watson/>.

¹⁸⁷ Associated Press, "NJ Congressman."

stipulations favorable to IBM's marketplace prowess. Steadily, from 2011 to late 2017, IBM increasingly placed Watson at the center of its corporate portfolio while simultaneously pursuing government policies and partnerships aimed at reconfiguring notions of skilled labor and how laborers attain such skills. This centering increasingly placed Watson at the nexus of IBM's attempts to 1) woo policymakers with vested interests in spurring job creation through privatized innovation; 2) reorient Dystopian notions about advanced AI; 3) engender a new class of highly-specialized tech workers; and 4) support and invest in pathways for training high-skilled workers as part of IBM's budding forays into public-private education.

In these ways, during the 2011-2017 timeframe, as IBM augmented Watson's technological affordances, these affordances were concomitantly positioned as augmentative to job opportunities, the dignity of workers performing such jobs, and the outcomes for workers, IBM, and third-party collaborations alike. Even as Watson's automated capabilities escalated towards increasing technological autonomy, IBM was careful to downplay dystopian notions of technological autonomy as neutralizing human autonomy and rework this dynamic into a more utopian conception in which Watson augments human autonomy alongside the AI's increasing autonomy. By pursuing policy as a means to formalize mechanisms for training workers with the skills to augment their autonomy through Watson, IBM sought to augment its own institutional autonomy and marketplace self-determination, especially as the company transitioned from a long-standing business model predicated on the manufacture and sale of hardware to a business model prioritizing Watson as software-as-a-service (SaaS) for third-party businesses. While these tactics reworked a technological determinism and dystopianism surrounding Watson (and AI more generally), they also created a series of legal provisions enabling IBM to commodify educational and vocational opportunities even as these provisions also allowed IBM to reap tax breaks and other economic benefits stemming from the recruitment and retention of what the company would begin referring to as "New Collar" workers.

As I will demonstrate, New Collar work emerges out of IBM's strategic use of "augmentation" to describe the productive and intellectual capacities of humans enhanced by collaboration with Watson and "cognitive" as a rubric for reconceptualizing Watson and IBM's contemporary marketplace prowess. On this latter front, IBM's insistence on the augmentative capacities of Watson stems a preference for "cognitive" as opposed to "artificial" intelligence, a means of reversing AI-based dystopian implications for human vitality and stressing the ability of Watson to inflect tech workers with its automated cognition. Moreover, "cognitive" also exemplifies IBM's attempt to assert its prowess in contemporary digital economies by stressing Watson as the signifier of the "cognitive era" of computing and IBM as the progenitor and corporate titan of this era. Before delving into my analysis, however, it's important to clarify the relationship between computational cognition and automation, as IBM's use of cognition in approximation to its highly-automated technology dovetails with scientific engineering literatures on "cognitive automation" as the cooperative exchange of decision-making attributes between humans and intelligent automated machines. By accounting for scholarship on cognitive automation, I not only deepen an understanding of the ties between automation and cognition but, more importantly, stress the importance of autonomy as a critical attribute among IBM's politico-economic motivations and ensuing implications for emerging tech workers.

3.1 Automated Cognition

When explicitly scrutinized as a distinct phenomenon, cognitive automation is chiefly analyzed in the context of two paradigms: vehicular navigation,¹⁸⁸ and assembly systems.¹⁸⁹ Defined as the use of software “intended to automate cognitive activities, such as situation assessment, monitoring, and fault management”¹⁹⁰ otherwise conducted by human beings, these literatures tend to focus on the ability of automated cognition to lend support to human operators for situational assessment, transfer of task orientation, and execution of such tasks. Generally speaking, these streams of scholarship are concerned with automation and its cognitive capacities as a means of productive workflow and output. While, at times, researchers might gesture towards the implications for human laboring vitality, including the possibility of assessing “the operators own view of the assembly line in order to design the right cognitive support for them,”¹⁹¹ this research is not designed to conceptualize the employability or empowerment of the labor force in relation to the creep of automated cognition, nor are the designed to derive such ideas by understanding the economic informants of companies turning towards cognitive machines.

¹⁸⁸ Schulte, Axel. "Cognitive automation for tactical mission management: concept and prototype evaluation in flight simulator trials." *Cognition, Technology & Work* 4, no. 3 (2002): 146-159; Onken, Reiner, and Axel Schulte. *System-ergonomic design of cognitive automation: dual-mode cognitive design of vehicle guidance and control work systems*. Vol. 235. Springer, 2010; Uhrmann, Johann, and Axel Schulte. "Task-based guidance of multiple uav using cognitive automation." In *COGNITIVE 2011, The Third International Conference on Advanced Cognitive Technologies and Applications*, pp. 47-52. 2011; Strenzke, Ruben, Johann Uhrmann, Andreas Benzler, Felix Maiwald, Andreas Rauschert, and Axel Schulte. "Managing cockpit crew excess task load in military manned-unmanned teaming missions by dual-mode cognitive automation approaches." In *AIAA Guidance, Navigation, and Control Conference*, p. 6237. 2011; Wander, Alexandra, and Roger Forstner. "Innovative fault detection, isolation and recovery on-board spacecraft: Study and implementation using cognitive automation." In *Control and Fault-Tolerant Systems (SysTol), 2013 Conference on*, pp. 336-341. IEEE, 2013; Theißing, N., G. Kahn, and A. Schulte. *Cognitive automation based guidance and operator assistance for semi-autonomous mission accomplishment of the UAV demonstrator sagitta*. Deutsche Gesellschaft für Luft-und Raumfahrt-Lilienthal-Oberth eV, 2013.

¹⁸⁹ Fasth-Berglund, Åsa, and Johan Stahre. "Cognitive automation strategy for reconfigurable and sustainable assembly systems." *Assembly automation* 33, no. 3 (2013): 294-30; Fast-Berglund, Åsa, Tommy Fässberg, Filip Hellman, Anna Davidsson, and Johan Stahre. "Relations between complexity, quality and cognitive automation in mixed-model assembly." *Journal of manufacturing systems* 32, no. 3 (2013): 449-455; Choe, Pilsung, Jeffrey D. Tew, and Songzhen Tong. "Effect of cognitive automation in a material handling system on manufacturing flexibility." *International Journal of Production Economics* 170 (2015): 891-899.

¹⁹⁰ Thurman, David A., David M. Brann, and Christine M. Mitchell. "An architecture to support incremental automation of complex systems." In *Systems, Man, and Cybernetics, 1997. Computational Cybernetics and Simulation., 1997 IEEE International Conference on*, vol. 2, pp. 1174-1179. IEEE, 1997.

¹⁹¹ Fast-Berglund et al, "Relations Between Complexity," 7.

Research on artificial intelligence and cognition has swelled in parallel with the public awareness of Watson and IBM's epochal branding of the "cognitive era" of computing. Computer scientists and engineers consider relational currents between cognitive science and the information-processing capabilities of artificial intelligence,¹⁹² including the digital modeling of neural pathways,¹⁹³ and information reasoning, comprehension, and expression.¹⁹⁴ Beyond a recent trend analyzing the relatedness between AI and cognition, the "cognitive computer" was developed in the 1980s¹⁹⁵ as a rubric for conceptualizing "this obscure field" and "how intelligence computers affect the world we live in."¹⁹⁶ These approaches are worthwhile for their contributions to the philosophy of mind and AI, the cognitive performance of AI, and foundational modes of unpacking the ways human cognition allegorizes and models AI design. Likewise, cognitive automation is useful for the way it thinks-through the realities of awareness and task flow among human-machine collaboration.

What's missing, however, is a more precise analysis of the material circumstances informing the manifestation of such collaboration and, more pertinently, the implications for humans to maintain laboring and professional vitality amidst cultural narratives increasingly supposing the diminishment of human productivity, intellectual uniqueness, and social dignity at the hands of technologies accelerating towards autonomous states. As noted in the introduction, beyond fanciful pop culture imaginings, these

¹⁹² Bickhard, Mark H., and Loren Terveen. *Foundational issues in artificial intelligence and cognitive science: Impasse and solution*. Vol. 109. Elsevier, 1996.

¹⁹³ Konar, Amit. *Artificial intelligence and soft computing: behavioral and cognitive modeling of the human brain*. CRC press, 1999.

¹⁹⁴ Wenger, Etienne. *Artificial intelligence and tutoring systems: computational and cognitive approaches to the communication of knowledge*. Morgan Kaufmann, 2014; Helman, David Henry, ed. *Analogical reasoning: Perspectives of artificial intelligence, cognitive science, and philosophy*. Vol. 197. Springer Science & Business Media, 2013; Spiro, Rand J., Bertram C. Bruce, and William F. Brewer, eds. *Theoretical issues in reading comprehension: Perspectives from cognitive psychology, linguistics, artificial intelligence and education*. Vol. 11. Routledge, 2017; Lisetti, Christine L., and Diane J. Schiano. "Automatic facial expression interpretation: Where human-computer interaction, artificial intelligence and cognitive science intersect." *Pragmatics & cognition* 8, no. 1 (2000): 185-235.

¹⁹⁵ Schank, R.C., and Childers, P. *The cognitive computer on language, learning, and artificial intelligence*. United States: N. p., 1984. Web; Gupta, Madan M. *On the cognitive computing: perspectives*. University of saskatchewan. College of engineering, 1988.

¹⁹⁶ Schank and Childers, *The Cognitive Computer*.

narratives crisscross arenas of civic politics, economics, business, and cottage industries supporting their enterprise through sober forecasts, trend analyses, white papers, and other formal reportage. Thus, my approach seeks to understand the way human autonomy is built into mechanisms for smoothing the cultural inception of autonomous technologies into prominent public life. In the case of IBM, the centrality of Watson to the company's corporate portfolio and the gestures made by IBM executives to woo political power brokers evokes questions about the use of formal policy to underwrite economic circumstances beneficial to IBM's marketplace latitude. IBM's regard for policy as a means to attain financial remuneration for employee training and retention transpired in tandem with the company's insistence on its ability to upskill and augment a new type of American worker: the technologically-savvy New Collar worker. IBM's offering of New Collar training and labor situated Watson as a driving force for human autonomy, a means of augmenting New Collar workers' ability to pursue meaningful training, employment, and purposeful application of skills. In order to more precisely understand the complications of autonomy among IBM's attempt to leverage policy arenas, fortify New Collar labor, and do so with an eye towards the autonomy of tech workers and IBM's corporate autonomy, my approach analyzes a proposed legislative bill not unfamiliar to IBM's corporate priorities: the New Collar Jobs Act of 2017.

3.2 The New Collar Jobs Act: Politicizing Autonomy

Introduced in the U.S. House of Representatives on July 25, 2017, the New Collar Jobs Act of 2017 (henceforth: New Collar Jobs Act) proposes to amend the federal tax code to allow employers to claim an "employee cybersecurity education tax credit" for costs incurred by an employer who contributes to an employee's attainment of a collegiate degree or federally-recognized training certification.¹⁹⁷ At first glance, the applicability to Watson, IBM, and tech workers might seem opaque, yet both the use of "New Collar" in the bill's title and the intersecting provisions for skills training and cybersecurity closely

¹⁹⁷ 115th Congress, "New Collar Jobs Act of 2017," <https://www.congress.gov/bill/115th-congress/house-bill/3393>.

align with IBM goals, strategies, and public discourse aimed at concomitantly uptraining emerging tech workers with the skills necessary to work with Watson (and other advanced computational technologies) and minimizing financial expenditures for such training. As IBM sought to transition from a manufacturer of personal computing hardware and software to a provider of diversified computer services primarily aimed at third-party ventures, this move towards a business-to-business (B2B) model saw IBM increasingly position Watson as a solutions-driven platform for healthcare, meteorology, media production, tax preparation, and other diversified interests. In doing so, IBM also increasingly attempted to foster relationships with policymakers and other political power brokers, aligning policymakers' inclination for private sector job creation, training, and employment with areas of mutual interests, such as Watson's increasing applicability for cybersecurity. The emergence of the New Collar Jobs Act is not only a significant alignment of IBM corporate priorities with the agendas of the Republican-controlled U.S. House, but a rich causeway for assessing IBM's construction of New Collar work, its ideological alignment with political gatekeepers, diversified applications for Watson, and New Collar workers capable of using Watson to drive innovate outcomes in diversified sectors. More critically, assessing the New Collar Jobs Act is an orienting force for understanding the significance of autonomy to IBM's construction of New Collar work, training and employability, as the company framed the upskilling and employment of New Collar workers as a source of productive and professional autonomy for these workers and leveraged embedded notions of autonomy to pursue policy outcomes enabling IBM to enlarge its corporate autonomy amidst shifting business models, marketplaces, and political climates. Thus, the New Collar Jobs Act is the most viable means of tracing the significant points of discourse enabling the manifestation of its proposed enactment and illuminating the significance of workers and corporate autonomy to the development and uses of Watson.

3.3 The New Collar Jobs Act: Assessing Autonomy

The New Collar Jobs Act is therefore significant for several reasons. First, the Act is a means of assessing the construction of New Collar as both conceptual category of labor and how this conceptualization bears on political ideologies embedded into the Act. Second, the Act readies a means of correlating the Act's provisions with the economic motivations of IBM, especially as the company continues to transition from manufacturer of hardware and software to a services-based company with Watson at the forefront of these services. The Act is also a fruitful locus for understanding autonomy as a condition ascribed to various conceptions, institutions, interactions and related paradigms, despite the absence of the term "autonomy" itself. While the autonomy of Watson as a technological affordance is the subject of much popular discourse, little has been done to address the autonomy of various actors shaping the circumstances surround the development of Watson, who works with Watson, how workers interact with Watson, the outputs of this work, and the stakes and motivations of IBM as they attempt to position the company in an advantageous spot to economically capitalize on the cross-correspondence of these paradigms. In this sense, the technological determinism surrounding conceptions of AI and increasingly autonomous technologies can be reworked into a more precise understanding of the autonomous conditions ebbing and flowing across legal, economic, institutional, and social vectors, a precision primed by careful analysis of the New Collar Jobs Act, one that treats the Act as a significant "nodal point" within a broader discursive network and pays heed to scholarship foregrounding the importance of assessing policy and policymaking discourse.

3.4 Methodology: The Nodal Point of Policy Discourse

My approach intends more than an exclusive read of a single policy text and instead situates this policy text as a "nodal point" weaving together discourses external to policy verbiage yet no less critical in fomenting ideologies, values, and beliefs built into the New Collar Jobs Act's legal, economic, institutional, and social intentions. A nodal point, as described by Laclau and Moueffe, is a privileged site

among a broader network of discursive formations.¹⁹⁸ By treating the Act as a nodal point, notions of worker and corporate autonomy can be readily identified in IBM discourse aimed both directly and indirectly at policymakers and therefore infusing the circumstances of the Act's development and the language of the text itself. Nodal points crystallize the plurality of meanings and conceptions evacuated from a single policy text and circulating amongst its influencers. In this way, using a nodal point methodology for policy analysis corresponds to the ability to conceptualize autonomy as condition beyond its prominent association with technologies such as Watson and, more precisely, illuminate the plurality of autonomy penetrating discourse around Watson's development, use, and economic underwriting. In other words, the nodal point methodology is the viable method to excavate – through the New Collar Jobs Act – complications of autonomy that supersede broader discourses and dispositions around autonomous technologies. Similarly, this approach aligns with media and technology studies scholarship leveraging the nodal point methods to excavate plural associations embedded in policy discourse around critical technological issues.

Media scholar Becky Lentz treats a series of policy texts as nodal points in her attempt to explore the shifting definitions and interpretations of “neutrality” among internet neutrality debates dating back to 1986.¹⁹⁹ By situating the New Collar Jobs Act as a nodal point significant amidst IBM's attempts to sway policymakers through attempts to instill interpretations of New Collar and correlate those interpretations with legal provisions, my approach approximates Lentz's attempt to understand the net neutrality debate. Just as Lentz 's attempt to understand “net neutrality” revealed a plurality of associations with “information service,” “enhanced service,” “telecommunications service,” “single integrated ser-

¹⁹⁸ Ernesto Laclau, and Chantal Mouffe, *Hegemony and Socialist strategy: Towards a Radical Democratic Politics*, (Verso Books, 1985): 112.

¹⁹⁹ Becky Lentz, "Excavating historicity in the US network neutrality debate: An interpretive perspective on policy change." *Communication, Culture & Critique* 6, no. 4 (2013): 571-572.

vice” as particulate informants to larger conceptions of net neutrality (such as what kind of service is allegedly “neutral”),²⁰⁰ my approach similarly strives to understand notions of autonomy informing the construction of New Collar as a terminological conceit and how this construction likewise informed the legal provisions of the New Collar Jobs Act. If policy is “dominated by those with the most extensive financial, ideological and political resources who are best able to mobilize their interests against their rivals,”²⁰¹ the adoption of New Collar by Congressional actors less than a year after the term was initially propagated by IBM suggests the company possesses a mastery of ideological and political sway that must be understood by tracing IBM’s machinations across its institutional texts and discourses.

Furthermore, my approach is indebted to strands of media studies literatures increasingly looking to policy and policymaking as critical vectors for assessing intertwined technological, economic, legal, and cultural conditions. Since the early 2000s, policy has increasingly moved to the forefront of intertwined questions involving the cultural significance, historical import, and material realities shaping the development and inception of media and technological systems. This includes key works that advocate for policy as an important arena of critical media analysis;²⁰² interlock policy, industrial practice, and cultural output;²⁰³ interrogate political ideologies of policies favorable to media (de)regulation, conglomeratation, and commodification;²⁰⁴ and situate policy amidst globalized and transnational media development and distribution.²⁰⁵ Among these literatures, scholars also undertake focused analyses of a single

²⁰⁰ Ibid.

²⁰¹ Freedman, *The Politics of Media Policy*, 22.

²⁰² Des Freedman, *Television Policies of the Labour Party 1951-2001* (Routledge, 2003); Des Freedman, *The Politics of Media Policy* (Polity: 2008).

²⁰³ Toby Miller and George Yúdice, *Cultural Policy* (Sage, 2002); Terry Flew, *The Creative Industries: Culture and Policy* (Sage: 2011); Stuart Cunningham, *Hidden Innovation: Policy, Industry and the Creative Sector* (University of Queensland Press, 2013).

²⁰⁴ Jennifer Holt, *Empires of Entertainment: Media Industries and the Politics of Deregulation* (Rutgers University Press, 2011); Susan Crawford, *Captive Audience: The Telecom Industry and Monopoly Power in the New Gilded Age* (Yale University, 2013); John McMurria, *Republic on the Wire: Cable Television, Pluralism, and the Politics of New Technologies, 1948-1984* (Rutgers University Press, 2017).

²⁰⁵ Marc Raboy, ed., *Global Media Policy in the New Millennium* (Indiana University Press, 2002); Terry Flew, Petros Iosifidis, and Jeanette Steemers eds., *Global Media and National Policies: The Return of the State*, (Routledge, 2016); Aynne Kokas, *Hollywood Made in China* (University of California Press, 2017).

policy, including the Digital Millennium Copyright Act;²⁰⁶ the Radio Act of 1927;²⁰⁷ the Telecommunications Act of 1996;²⁰⁸ and the Public Broadcasting Act of 1967.²⁰⁹

Either directly or indirectly, these projects are indebted to the work of Thomas Streeter, whose landmark work *Selling the Air: A Critique of the Policy of Commercial Broadcasting in the United States* (1996) enfolded critical theory, Foucauldian discourse analysis, and political economy into a methodological practice capable of assessing the role of policy as both a source and constitutive component of commercial and political power.²¹⁰ Using this method, he argued for commercial broadcasting to be understood not as a technology or cultural form (as Raymond Williams otherwise observed about broadcast television²¹¹), but as a “legal inscription on technology”²¹² influencing the operation of technology beyond its material affordances. In a similar vein, I seek to illuminate the ways legal machinations such as the New Collar Jobs Act not only inscribe notions of autonomy on technology and its non-material affordances, but inflects who gets to experience autonomy through work with Watson, how the skills for such work are engendered, and what motivates corporate and legal sectors to align their efforts towards economically underwriting high-tech worker autonomy.

²⁰⁶ Hector Postigo, *The Digital Rights Movement: The Role of Technology in Subverting Digital Copyright* (MIT Press, 2012); Peter Decherney, *Hollywood's Copyright Wars: From Edison to the Internet* (Columbia University Press, 2012).

²⁰⁷ Robert McChesney, *Telecommunications, Mass Media, and Democracy: The Battle for the Control of US Broadcasting 1928-1935* (Oxford University Press, 1995); Louise Benjamin, “Working It Out Together: Radio Policy from Hoover to the Radio Act of 1927,” *Journal of Broadcasting & Electronic Media* 42, no. 2 (Mar. 1998): 221-236; Mark Goodman and Mark Gring, “The Radio Act of 1927: Progressive Ideology, Epistemology, and Praxis,” *Rhetoric & Public Affairs* 3, no. 3 (Fall 2000): 397-418.

²⁰⁸ Patricia Aufderheide, *Communications Policy and the Public Interest: The Telecommunications Act of 1996* (Guilford Press, 1999).

²⁰⁹ Robert K Avery, “The Public Broadcasting Act of 1967: Looking Ahead by Looking Back,” *Critical Studies in Media Communication* 24, no. 4 (Oct. 2007): 358-364.

²¹⁰ Thomas Streeter, *Selling the Air: A Critique of the Policy of Commercial Broadcasting in the United States* (University of Chicago Press, 1996).

²¹¹ See: Raymond Williams, *Television: Technology and Cultural Form* (Psychology Press, 2003).

²¹² Thomas Streeter, “Policy, Politics, and Discourse,” *Communication, Culture & Critique* 6, no. 4 (Nov. 2013): 488-501.

My analysis of the New Collar Jobs Act is likewise indebted to Streeter's brand of discourse analysis, political economy, critical application of (digital media) theory, and concern for commercial and political power influencing IBM, policymakers, and overlapping political and economic ideologies. IN addition to Streeter's work on policy, my approach reflects Des Freedman's concern with "*ideological* resources brought to the media policy process and the contrasting sets of ideas that are either normalized or marginalized in the clashes that take place,"²¹³ especially since scholarly analyses of a singular policy necessitates critical inquiry of circumstances shaping the development of the policy, including terminological assumptions, contestations, and conceptions fomenting prior to the inception of legal encoding. When Hector Postigo interrogates the Digital Millennium Copyright Act (DMCA), his considerable insights are buoyed by looking upstream to legislative histories and pre-enactment markers that "illustrate the issues that confronted policymakers, content owners, and some consumer representatives"²¹⁴ well before the official enactment of these issues in the DMCA. Likewise, Louise Benjamin's analysis of the 1927's Radio Act pinpoints the policymaking process leading to its enactment as the result of shared desires to "meet societal needs for national reform and steady economic expansion" among federal government actors (Herbert Hoover, Department of Commerce) and private corporations (G.E., RCA, AT &T).²¹⁵ My analysis gestures towards this work as I look upstream from the New Collar Jobs Act towards IBM's construction of New Collar as a term free and clear of dystopian associations with Watson and advanced AI in general. As I will demonstrate, IBM's construction of New Collar and the instantiation of legal provisions corresponding to New Collar work indicate an ideological contrast between IBM and popular con-

²¹³ Des Freedman, *The Politics of Media Policy* (Polity, 2008): 13 [italics in original].

²¹⁴ Postigo, *The Digital Rights Movement*, 18.

²¹⁵ Louise Benjamin, "Working it out together: Radio policy from Hoover to the Radio Act of 1927," *Journal of Broadcasting & Electronic Media* 42, no. 2 (1998): 221.

ceptions of Watson’s relation to labor, as well as an ideological correlation between IBM’s economic investments and the specific provisions of the New Collar Jobs Act. This contrast, and the implications writ large, are the complications of autonomy unearthed through my approach.

3.5 Methodology: Mapping “New Collar” and the New Collar Jobs Act

Unpacking these dynamics entails a twofold analytical process. First, I map the conception of “New Collar” as a terminological construct indicative of a categorization of workers and technologically-based work processes performed by such workers. By understanding the New Collar Jobs Act as a nodal point linking together a broader set of discourses leveraged by IBM in public-facing corporate documentation, the New Collar Jobs Act signifies the process whereby the construction of legal definitions orients to economic, political, and institutional ideologies preceding the instantiation of such definitions in legal code. In this way, IBM’s imaginaries of *what* New Collar work entails, *who* performs this work, and *how* vocational training instills New Collar competencies suffuse the Act, even absent a formal definition for how this policy and its legislative authors stipulate “New Collar.” Furthermore, by increasingly placing Watson at the forefront of its business model alongside the construction of New Collar, IBM situated Watson as a primary means for New Collar job creation and the ability for New Collar workers to augment their autonomy. As we shall see, this notion of “augment” is key to the relationship among Watson, New Collar work, and autonomy, given IBM’s strategic use of “augment” to reorient dystopian connotations associated with Watson and other advanced AI and instead position Watson as an augmentative force for human ingenuity, institutional collaboration, and economic vitality. Mapping “New Collar” is thus necessary to disentangle the myriad informants of “New Collar” in the New Collar Jobs Act and more strenuously pinpoint the motivations of IBM executives curating economically-advantageous conceptions of New Collar work. As I will demonstrate, IBM stresses Watson as an augmentative to the skills, employability, and productive vitality of New Collar workers, asserting the enhanced autonomy

these workers will gain as a result of plying their trade through Watson, rather than (as popular narratives would have it) succumbing to the autonomous prowess of Watson's alleged "job-stealing" potential.

The second aspect of my twofold analytical approach to the New Collar Jobs Act concerns the Act's legal codification of stipulations that allow employers (such as IBM) to claim a tax credit on institutional expenditures used to train employees with competencies in 19 specialty areas of cybersecurity. While IBM's discourse stresses the newfound forms of autonomy New Collar workers will experience through Watson, this bill spotlights the economic incentives motivating IBM's propagation of New Collar workers, especially as IBM increasingly uses public-private partnerships to make inroads into the monetization of vocational training transpiring through public schools. By investing in these schools, IBM can directly influence the uptake of vocational skillsets necessary to work with Watson, leverage educational institutions to instill IBM's institutional ethos among primary school students, and enlarge the pool of New Collar workers ready to evolve the company's products and services. The New Collar Jobs Act is therefore a means for IBM to increase its institutional autonomy by leveraging their conception of human-oriented New Collar autonomy towards policy arenas ideologically-inclined towards supply-side job creation and tax incentives. In this way, the New Collar Jobs Act shines a light on IBM's intensification of "cognitive capitalism" logics wherein IBM increasingly captures and monetizes intelligence across educational, legal, and marketplace venues. As I will demonstrate, the uplift of IBM's institutional autonomy in a cognitive capitalist marketplace occurs through modalities of production and accumulation that limit and restrict the ability for New Collar workers to maintain heightened autonomy beyond the auspices of educational, legal, and corporate institutions modeled on IBM's corporate conception of autonomy.

In the following section, I map IBM's conception of New Collar as both category of workers and the sophisticated technological competencies this category of work entails. Through this mapping, I also account for the increasing privilege IBM accords to Watson among its corporate portfolio and marketplace

ventures. By mapping the construction of New Collar, I demonstrate the ways IBM reworks dystopian notions of artificial intelligence, charts distinct pathways for New Collar training, positions Watson as an augmentative force for the autonomy of New Collar work, and derives “cognitive” products and services infused with the augmented autonomy of both humans and Watson.

3.6 Mapping New Collar

The term “New Collar” is mostly absent from the text of the New Collar Jobs Act, appearing only in the bill’s title. Where the Act itself leaves “New Collar” undefined, IBM’s THINKPolicy blog and popular press provided opportunities for IBM to typify New Collar work and align this typology with specific policy objectives of the Trump administration, as well as entrenched neoliberal ethos of supply-side investment and austerity as engines of job creation favored by fiscally-conservative Republicans.²¹⁶ Understanding policy as a nodal point for discursive strategies influencing policymaking actors, institutions, processes, and outcomes, the definitional absence of “New Collar” in the text of the New Collar Jobs Act implores a rigorous accounting of how New Collar was constructed by IBM and internalized by legislative power brokers. Moreover, it is an *opportunity* to unearth this construction and internalization, notably since the titular usage of “New Collar” alongside the absence of further context is symptomatic of IBM’s successful inscription of “New Collar” onto political ideologies, legislative outcomes, emergent work categories, and pathways for worker training and employability. In this way, mapping a typology of “New Collar” by working backwards from the New Collar Jobs Act aligns with media studies scholarship intent on understanding the role of policy and its textuality as infused with institutional, intellectual, and ideological struggles incubated among power brokers well before these brokers put ink to legislative parchment.

²¹⁶ In the wake of the 2017 presidential election, Republicans took control of the U.S. Presidency, House of Representatives, and Senate.

IBM's initial reference²¹⁷ to New Collar work appeared in a letter to President-elect Donald Trump posted on IBM's THINKPolicy blog on November 15, 2016, just one week after the 2016 presidential election. Penned by IBM CEO Ginny Rometty, the letter seeks to align Trump's policy priorities with IBM's unique capabilities to address these priorities, covering topics ranging from infrastructure to government fiscal inefficiency to employer-sponsored healthcare. The letter's first priority area is New Collar jobs, a class of worker Rometty endeavored to both create and hire. For Rometty, emerging roles in cybersecurity, data science, and "cognitive" business necessitate competencies more readily available through vocational skills training than four-year college degrees.²¹⁸ With deference to Trump campaign discourse invoking the importance of vocational training, Rometty touts IBM's "new educational model" as an approach that aligns traditional public education and vocational training to maximize the efficiency and professional viability of learning outcomes.²¹⁹ Despite being unnamed in the letter to Trump, this approach is IBM's Pathways In Technology Early College High Schools (P-TECH), an educational model in which IBM invests (through public-private partnerships) in six-year public schools that hybridize grade 9-12 STEM-based education with two years of vocational training aimed at putting STEM skills into practice. P-TECH students graduate with an associate degree in science, engineering, computers, or other STEM-related area that provides skills and aptitudes to pursue further education or "step easily into high-growth, 'new collar' jobs."²²⁰ Less than one year later, on July 25, 2017, Congress introduced the New Collar Jobs Act of 2017. By amending the tax code to "establish an employee cybersecurity education tax credit" available to employers who cover costs for employees earning degrees or certifications

²¹⁷ In a Jan. 22, 2018 THINKPolicy blog post, IBM links to a Rometty-penned *USA Today* op-ed published on Dec. 13, 2016. Through a partially-hyperlinked parenthetical note "before the term 'new collar' was even coined," the post implies this op-ed represents IBM's coinage of New Collar. Despite this implication, Rometty's Nov. 15, 2016 letter to President-elect Trump is IBM's first public use of "New Collar."

²¹⁸ Ginny Rometty, "IBM CEO Ginny Rometty's Letter to the U.S. President-Elect," IBM THINKPolicy, Nov. 16, 2016, <https://www.ibm.com/blogs/policy/ibm-ceo-ginni-romettys-letter-u-s-president-elect/>.

²¹⁹ Rometty, "IBM CEO."

²²⁰ IBM, "P-TECH: when ambitions meets opportunity, success happens," <https://www.ibm.com/thought-leadership/ptech/index.html>.

in competencies related to cybersecurity.²²¹ Despite the absence of the term “new collar” in the full text, the Act attempts to legally-codify economic remunerations beneficial to IBM as both provider and recipient of New Collar training.

In the wake of IBM CEO Ginny Rometty’s Nov. 15, 2016 letter to Trump, Rometty and other IBM executives outlined their concept of New Collar work alongside the company’s unique ability to train New Collar workers. In doing so, IBM’s discourse sought to reframe dystopian impressions of Watson and other advanced AI, impressions fomented by Watson’s seeming autonomy from human operation during its 2011 televised *Jeopardy!* win. Even though IBM is quick to promote Watson’s victory and the subsequent enhancement of its technological capabilities, the company is careful to situate the enhancement of Watson as, first and foremost, augmentative to the autonomy of humans. While many popular depictions and assessments of artificial intelligence posit AI and other increasingly autonomous technologies as a threat to human autonomy, IBM’s careful deconstruction of dystopian horizons enabled the company to construct a profile of Watson as an engine of human ingenuity, capability, and employability. By reconfiguring past impressions of its AI in relation to human autonomy in the contemporaneous moment, IBM leveraged these reconfigured ideas about technological and human autonomy towards future policy outcomes, attaining a measure of success with the introduction of the New Collar Jobs Act in July 2017. When IBM began foregrounding “New Collar” in late 2016, the deployment of this term marshalled and accentuated many of the discursive tactics used by IBM during the 2011-2017 timeframe (what IBM refers to as the emergence of the “cognitive era”) to both counterpose dystopian associations with Watson and increasingly place Watson at the center of IBM’s corporate strategies. Even when Watson and New Collar seem to appear at a remove in IBM corporate messaging, IBM’s positioning of Watson as an augmentative force for human autonomy inflects upon New Collar, as from its inception

²²¹ 115th Congress, “New Collar Jobs Act of 2017,” <https://www.congress.gov/bill/115th-congress/house-bill/3393>.

the typology of New Collar evacuates dystopian associations and furthermore invokes new (quasi-utopian) horizons for education, training, and employability.

3.7 Mapping New Collar: Augmenting Autonomy

In tandem with downplaying dystopian themes associated with Watson, IBM plays up Watson's unique ability to augment the autonomy of New Collar workers and outcomes of New Collar work. IBM's primary method of situating Watson as a driver of human autonomy stresses the inadequacy of the term "artificial intelligence." For IBM, dystopian and mythic associations with "artificial intelligence" obfuscate efficient and expanded possibilities for technological work and work outcomes. As a way to distance IBM and Watson from such associations, IBM corporate executives and researchers employ two primary terminological constructs that reinforce the autonomy of New Collar workers and institutions leveraging New Collar work: "augmentative" and "cognitive."

In the case of the former, "augmentative" – and its variations "augment," "augmented," and "augmentation" – refer to the "intelligent" capacities of "artificial intelligence." IBM blogs, reports, white papers, promotional materials and trade press interviews reiterate a common approach: leverage the acronym "AI" to downplay "artificial intelligence" and stress "augmented intelligence" wherein "augmented" refers to human workers, work processes, and outcomes. Where "artificial intelligence" connotes fabricated neural processes confined to silicon-based technologies, "augmented intelligence" evokes *human intelligence* as the primary force driving sophisticated technological systems and outcomes performed through these systems. Augmented intelligence enables IBM to stress human-oriented autonomy and the flowering of sophisticated mastery of computational skills performed by human beings.

In addition to "augmented," the term "cognitive" refers to a series of technological phenomena both specific to IBM and born from IBM institutional innovation. Watson is a "cognitive" system, emblematic of the potential of "cognitive" computing, herald of the "cognitive" era of computing, and the driving force behind "cognitive" outcomes. Alongside augmentation as a force innately empowering of

human intelligence, “cognitive” enables IBM to emphasize intellect as a shared – or, rather, “distributed” – condition among humans and Watson, thereby recasting notions of AI as “job-stealers” and instead positing Watson as a co-constituted force augmentative of New Collar autonomy. This notion of “distributed” harkens towards a common strand of posthumanist theory: “distributed cognition” as an emergent condition among humans and non-humans. In the case of Watson, posthumanist theory illuminates the relationship among IBM’s reworking of dystopian motifs into a sophisticated discursive relay for generating newfound vistas of human intellect and performances transpiring through Watson. To be clear, my claim here is not that New Collar workers are posthuman workers *per se*; rather, IBM’s attempt to downplay the dominance of Watson and AI is best understood through the lens of posthumanist theory, specifically the process of re-centering humans by centering Watson as the core asset of IBM and the primary means for attaining renewed possibilities for human autonomy. Posthumanist theory brings clarity to the construction of “New Collar” as a class of workers and work performances empowered by the sophisticated intelligence of Watson and its augmentative capacities, infusing the term with connotations that concomitantly enable IBM to leverage policy arenas to align its technology and innovative prowess with policy outcomes.

A noteworthy example of IBM’s deployment of “augmented intelligence” and “cognitive” is IBM’s white paper “Computing, Cognition, and the Future of Knowing.” Authored by Dr. John E. Kelly III (Senior VP for IBM Research and Solutions Portfolio) and subtitled “How Humans and Machines are Forging a New Age of Understanding,” the white paper conceptualizes “artificial intelligence” as “co-opted by Hollywood, mischaracterized by the media, portrayed as everything from savior to scourge of humanity,” while also decrying “sentience or autonomy on the part of machines.”²²² Opposed to “artificial intelli-

²²² John E. Kelly, “Computing, Cognition, and the Future of Knowing: How Humans and Machines are Forging a New Age of Understanding,” Oct. 2015, https://www.research.ibm.com/software/IBMResearch/multimedia/Computing_Cognition_WhitePaper.pdf.

gence” and a purely machinic autonomy, Kelly advocates for a Watson as a cognitive system “augmenting the human ability to understand – and act upon – the complex systems of our society.”²²³ With this invocation of “cognitive system,” it’s necessary to briefly outline distinctions between “cognitive computing” and “cognitive system” as utilized by IBM.

“Cognitive computing” refers to a series of advanced computational capabilities designed to learn how to perform specific tasks based on interactions with humans.²²⁴ Rather than being programmed to deliver particular outcomes, cognitive computing is an assemblage of techniques enabling computers to learn and reason from datafied inputs to generate well-defined outputs. Techniques such as machine learning, computer vision, and pattern recognition reflect human intellectual processes for comprehending sensorial input and learning to logically process and structure outputs, hence the applicability of “cognitive.” A “cognitive system,” on the other hand, is a particular instantiation of any range of such techniques. When exemplifying Watson as a “cognitive system,” IBM notes Watson’s ability to “tease apart the human language to identify inferences between text passages with human-like accuracy,”²²⁵ at a speed and scale unattainable through human intellect alone. In other words, cognitive computing is a series of generalized techniques (i.e. speech recognition), while a cognitive system is a particular instantiation of techniques for more directed purposes (i.e. Watson is a cognitive system with distinct methods for leveraging speech recognition to answer *Jeopardy!* questions).

3.8 Mapping New Collar: Augmented Human Autonomy and Posthuman Cognition

The ability for Watson to augment human ability is made possible through a “distributed cognition” of intellectual tasks and performances. In posthumanist theory, distributed cognition is a foundational

²²³ Ibid.

²²⁴ Ibid

²²⁵ Rob High, “The Era of Cognitive Systems: An Inside Look at IBM Watson and How it Works,” Dec. 12, 2012, <http://www.redbooks.ibm.com/redpapers/pdfs/redp4955.pdf>.

tenet descriptive of cognition as a transferrable condition among both humans and non-humans. Distributed cognition implores an understanding of cognitive capability and performance as an exteriority to human bodies and human biological matter, conceived instead as “carried out by a system in which a human interacts with objects, artefacts, tools and other humans.”²²⁶ Cognition, in this viewpoint, is not a matter of a biological human cognition colliding with a separate technological cognition; instead, when humans process information through Watson and other cognitive systems, cognition carries out informational tasks “across the boundaries of biological and nonbiological matter.”²²⁷ If viewed through the prism of a posthuman orthodoxy, we might understand this “union of the human with the intelligence machine”²²⁸ as an egalitarian union positing man-machine equality through a “*radical decentering of the transitional sovereign, coherent and autonomous human.*”²²⁹ In posthumanism, after all, the “post” prefix entails this very decentering, a point of view that stresses humans should be understood not as the supreme entities of ontological being but as co-constituted actors in a complex network of life forms and epistemological processes with “no essential differences or absolute demarcations”²³⁰ between humans and highly-intelligent computer systems, Watson or otherwise. Thus, the question of human autonomy is significant to foundational conceits of posthumanism. In attempting to move beyond the human as “coherent and autonomous,” the distributed cognition in posthumanism tends to imply a distributed autonomy among intellectual tasks performed through the co-constitution of human and technological work:

“‘cognition’ is actually being carried out by the system as a whole, not just the human being: for example, a pilot can only fly a plane in conjunction with the instruments, panels and readouts in the cockpit, all of which are sensing, monitoring, calculating, reacting to, storing

²²⁶ Peter Mahon, *Posthumanism: A Guide for the Perplexed* (Bloomsbury Publishing: 2017): 4.

²²⁷ Ibid 4

²²⁸ Hayles, *How We Became Posthuman*, 2.

²²⁹ Pramod Nayar, *Posthumanism* (Polity Press: 2013): 5 [italics in original].

²³⁰ Hayles, *How We Became Posthuman*, 3.

and displaying all the information necessary to keep the plane in the air. The cognition necessary to fly the plane happens in both flesh and blood and silicon and wire"²³¹

In other words, the pilot is only autonomous insofar as the machinic technologies and techniques open a range of possibilities enabling the human pilot to consider and determine courses of action. Human autonomy is therefore, much like cognition, not parked in the corporeal human but coursing across human and technological capabilities, interactions, and performances. But where posthumanism understands the autonomous human as a fictitious paradigm,²³² and distributed cognition traditionally implies a relative egalitarianism between humans and machines, IBM reorients this distribution by repositioning Watson as a means of *re-centering* human autonomy.

Whereas posthumanism begins with the premise that historical humanism radically overdetermined humans as privileged beings, IBM takes as its starting point the premise that AI and other technological intelligence is grossly overprivileged in the contemporary moment. Downplaying AI-related dystopianism and the term “artificial intelligence” is not only a means of situating IBM and Watson at a remove from social stigmas surrounding AI, but a way for IBM to position the company and its technology as the salutary corrective for an overdetermined centering of autonomous technologies among cultural imaginaries. In many cases, especially among discourses aimed at policymakers, IBM leverages “cognitive” alongside “augmented intelligence” as a tactic that stresses the sophistication of Watson while stressing this sophistication enables newfound human possibility. In IBM’s response to a Request for Information (RFI) from the U.S. Office of Science and Technology Policy on AI “tools, technologies, and training,”²³³ IBM begins by describing the proliferation of Watson among various industries (i.e. healthcare, security, the Internet of Things) alongside the increasing complexity and scale of Watson’s

²³¹ Mahon, *Posthumanism: A Guide*, 5.

²³² Nayar, *Posthumanism*, 35.

²³³ Office of Science and Technology Policy Office, “Request for Information on Artificial Intelligence,” June 27, 2016, <https://www.federalregister.gov/documents/2016/06/27/2016-15082/request-for-information-on-artificial-intelligence>.

capabilities in the wake of Watson's *Jeopardy!* win.²³⁴ As context for IBM's individual responses to the questions in the RFI, IBM invokes the advantages of "augmented intelligence" and "cognitive computing" as the company's preferred approach to augmented intelligence. Augmented intelligence can "enhance and scale human expertise," as opposed to the attempt to mimicry of human intelligence suggested by "artificial intelligence."²³⁵ Similarly, cognitive computing is a means to use augmented intelligence to "solve a wide range of practical problems, boost productivity, and foster new discoveries across many industries," a range of possibilities for enhanced human intelligence and intelligent decision-making made possible through the "form of IBM Watson."²³⁶ Before the coinage of "New Collar" and the emergence of the New Collar Jobs Act, IBM's address to policy officials sought to stress the autonomous potentials of Watson as a condition readied and at hand for human beings rather than a force ascending beyond human laboring capabilities. As IBM attempted to make clear, policymakers should understand Watson as the point of ascendancy for human intelligence and the ability to exercise autonomy in employability, productivity, and industrial innovation. In this sense, discourse aimed at policymakers inflected less on Watson and more so on what Watson makes possible for the alignment of corporate and federal government priorities for job creation and staffing of critical technological jobs. Just as Streeter noted the use of "blue skies" rhetoric in cable television policy discourse to foster industrially-advantageous conception of cable television as a populist form of engagement, IBM's rhetorical use of "augmentation" shifts notions of technology as autonomous to Watson as the grounds for human autonomy in arenas at the forefront of political priorities.²³⁷ In doing so, IBM also shifted the way augmentation and cognition situate among presiding notions and aims of posthuman theory.

²³⁴ IBM, "Response to – Request for Information Preparing for the Future of Artificial Intelligence," <http://research.ibm.com/cognitive-computing/ostp/rfi-response.shtml>.

²³⁵ Ibid.

²³⁶ Ibid.

²³⁷ Streeter, Thomas. "Blue skies and strange bedfellows: The discourse of cable television." *The revolution wasn't televised: Sixties television and social conflict* (1997): 221-242.

By augmenting human intelligence (“human expertise”) and leveraging cognitive computing to further augment outcomes (productivity, discoveries), human work performed with Watson is a distributed cognition that first distributes cognition in the vein of posthumanism, only to subsequently redistribute cognitive prowess and fortitude back to the human, ultimately repositioning the human as the center of ontological enterprise. In this way, IBM reconfigures a posthumanist perspective that views humans as the entities configured to be “seamlessly articulated with intelligent machines;”²³⁸ instead, IBM configures Watson for articulation with humans and, more critically, enables humans to articulate skillsets and performances indicative of human ingenuity. Where this posthumanist perspective sees a limit to the configuration of machine-bound humans,²³⁹ IBM’s reconfiguration of distributed cognition supposes no limits in the augmentation of human intelligence. Nonetheless, just as IBM configures Watson to augment human intelligence, IBM’s discursive articulations around “augment” must strategically elide other aspects of posthumanism and transhumanism that conceive of augmentation as a means of replacing or transcending human biology and life more generally, connoting dystopian fears about the overtaking or replacement of human biology and human life.

3.9 Mapping New Collar: Augmentation and Re-Centering Human Autonomy

Beyond a general use of “augment” (synonymous with “improving” or “enhancing”), “augmentation” is bound up in posthuman and transhuman speculations about emergent humanoid beings poised to supersede contemporary human beings. Philosopher Nick Bostrom notes the tendency of transhumanists to “view human nature as a work in progress, a half-baked beginning that we can learn to remold in desirable ways.”²⁴⁰ These desirable ways include “radical extension of human health-span, eradication of disease, elimination of unnecessary suffering, and augmentation of human intellectual,

²³⁸ Hayles, *How We Became Posthuman*, 3.

²³⁹ Ibid 284.

²⁴⁰ Nick Bostrom, “Transhumanist Values,” *Ethical Issues for the 21st Century*, ed. Frederick Adams (Philosophical Documentation Center Press, 2003), <https://nickbostrom.com/ethics/values.html>.

physical, and emotional capacities.”²⁴¹ Augmentation, in this sense, intends more than an uplift of attributes possessed by a human; it is an uplift of human attributes engendering a more advanced lifeform. In this vein, transhumanism overlaps with Kurzweil’s utopian ideas of a technological singularity, such as the use of nanobots to “augment and ultimately replace our organs,”²⁴² as a means of “transcending” the natural limits and finitude of human biology. Likewise, strands of posthumanist thought tend to imagine the transcended human emerging in the wake of seemingly unthinkable technologies. Speculative posthumanism envisions a future world of unimagined and/or unrealized technological sophistication where the potential for some posthumans to emerge as evolutionary epochal descendants of human beings can be realized within a “posthuman possibility space.”²⁴³ Within this space, the “disconnection thesis” suggests technological alteration could enable an entity (biological humans, animals, technical objects) to ultimately exist outside of human society and its governing paradigms.²⁴⁴ Through disconnection, and the exteriority to human society, these posthumans become “functionally autonomous.”²⁴⁵

Augmentation, for IBM, is preferable than “artificial” intelligence for what it enables the company to posit about the autonomy of New Collar workers, yet it is also a term that risks connotating apocalyptic visions of contemporary human inferiority and reorienting back towards dystopian conceptions of autonomy as the purview of robotic and other non-human lifeforms. Thus, IBM’s use of augmentation harkens towards Lev Manovich’s notion of augmentation as an idea and “cultural practice”²⁴⁶ extending beyond technological capacities for uplift and transcendence. Just as Manovich conceives of augmented humans traveling through material realms as a cultural practice co-augmenting space, bodies, and their

²⁴¹ Ibid.

²⁴² Kurzweil, *The Singularity*, 301.

²⁴³ David Roden, *Posthuman Life: Philosophy at the Edge of the Human* (Routledge: 2014): 53.

²⁴⁴ Ibid 113.

²⁴⁵ Ibid 124.

²⁴⁶ Lev Manovich, “The Poetics of Augmented Space,” *Visual Communication* 5, no. 2 (2006): 220.

situated actions,²⁴⁷ IBM similarly suggests a co-enlivening of humans, situated work process, and innovative industrial outcomes. When contextualizing the “augmented intelligence” of Watson, IBM stresses augmentation as tied to material opportunities for capitalizing on technological, marketplace, and institutional innovation in the present moment. In the wake of Rometty speaking at the World Economic Forum in January 2017, IBM’s Collaboration Solutions blog capitalized on her insistence that AI will not steal jobs and instead “work cohesively with most professions”²⁴⁸ by outlining commercial applications for augmented intelligence and cognitive techniques. Under the blunt, exclamatory headline “Augmented Intelligence, NOT Artificial Intelligence,” IBM’s answer to their self-imposed question “why does IBM choose to use ‘augmented intelligence’ or ‘cognitive’ over ‘artificial intelligence’?” offers “augmented intelligence with Watson” as a means to be “more productive with less work” across industries presently in need of innovative solutions, such as airline travel, healthcare, and insurance.²⁴⁹ In IBM’s 2016 annual report, the company outlines the fruits of augmented human productivity, situating Watson as the chief augments of human productivity and the generation of “cognitive” products and services derived from this augmentation.

3.10 Mapping New Collar: Augmented Autonomy and Cognitive Outcomes

IBM’s 2016 annual report begins by stressing work undertaken in the present day as transpiring *with* IBM and Watson. The title page’s sole text “You, *with* IBM” leads into a subsequent salvo declaring the company “reinvented IBM for this moment – to fuel your dreams with Watson” and build “*a world we all want to live in. The world you’re building, with IBM.*”²⁵⁰ Even as IBM conjures images of a socially-

²⁴⁷ Manovich, “The Poetics,” 225.

²⁴⁸ Anita Balakrishnan, “IBM CEO: Jobs of the Future won’t be blue or white collar, they’ll be ‘new collar,’” *CNBC*, Jan. 17, 2017, <https://www.cnbc.com/2017/01/17/ibm-ceo-says-ai-will-be-a-partnership-between-man-and-machine.html>.

²⁴⁹ Athar Afzal, “Augmented Intelligence, NOT Artificial Intelligence,” Collaborative Solutions Blog, IBM, Jan. 21, 2017, <https://www.ibm.com/blogs/collaboration-solutions/2017/01/31/augmented-intelligence-not-artificial-intelligence/>.

²⁵⁰ “2016 Annual Report,” IBM, <https://www.ibm.com/annualreport/2016/images/downloads/IBM-Annual-Report-2016.pdf>.

agreeable future world, this world is alive in the present day, in “this moment,” a guard against transhumanist and posthumanist disconnections from contemporary humanism reinforced using present tense verbiage to stress you *are presently* building this world (rather than you “will” or “can”). When Rometty’s letter to investors subsequently describes the purpose of AI to augment human intelligence, she does so amidst pull-quotes and headings respectively intoning Watson as the “AI platform for business” and the world “we” want to live in as “a world with Watson.”²⁵¹ Rather than augmentation as a force moving away from contemporary humanism and human society, IBM’s augmentation positions Watson as a present-day opportunity for humans and institutions to work “with” Watson and engender a “hopeful” and “more prosperous and progressive” future by focusing on commercial opportunities alive in the present moment.²⁵²

As evidence of these opportunities, IBM’s 2016 annual report offers 50 short case studies of professionals across numerous industries working with Watson and other IBM technologies to generate “cognitive” products and services. Among these cognitive outcomes, IBM cites Watson working *with* music producers and film editors to create a “cognitive song” and “cognitive film trailer” for the film *Morgan* (2016); working *with* chefs to create “cognitive cooking;”²⁵³ working *with* fashion designers to create a “cognitive dress;” and working *with* copywriters to develop “cognitive ads.”²⁵⁴ Thus, for IBM, working *with* Watson entails an augmented human intelligence empowered to deliver unparalleled possibilities for market-based solutions, products, and services. If, per the disconnection thesis, posthuman life forms becomes functionally autonomous by eclipsing societal paradigms, IBM’s strategic use of augmen-

²⁵¹ Ibid.

²⁵² Ibid.

²⁵³ IBM co-authored with the Institute of Culinary Education a book entitled *Cognitive Cooking with Chef Watson: Recipes for Innovation from IBM & the Institute of Culinary Education* (2015). IBM also released a browser app for generating cognitive cooking dishes with Chef Watson: <https://www.ibmchefwatson.com/community>.

²⁵⁴ Ibid.

tations proffers contemporaneous paradigms of capitalist marketplaces, workers, products, and institutions as opportunities to enliven the autonomy of New Collar workers by heightening and variegating work processes, collaborations, and outcomes. But, per IBM's discourse, if autonomy is heightened by IBM and its intellectual property (Watson), and if this heightening invariably leads to commodities poised to enrich IBM's economic and marketplace positioning, the questions then becomes one of the relationship between IBM's strategy of promoting the autonomous capabilities of New Collar workers and how this strategy serves IBM's institutional autonomy, as well as the tension between New Collar autonomy and IBM institutional autonomy.

The next section – “Mapping the New Collar Jobs Act” - therefore draws these questions more sharply into focus by contextualizing the provisions of the New Collar Jobs Act in relation to IBM's attempts to heighten its ability to self-determine in a turbulent economic marketplace alongside the company's transition from a producer of hardware and software to a services-based business-to-business (B2B) company. This section also continues to map the construction of “New Collar.” Whereas this section focuses on the attempts by IBM to imbue the term “New Collar” with connotations diametrically opposed to dystopian and mythic conceptions of AI and notions of diminished human autonomy accompanying these conceptions, the next section correlates provisions of the New Collar Jobs Act with conceptions of New Collar work aligned with political ideas about how human autonomy is potentialized and realized. This is especially critical for understanding motivations for IBM to construct ideas about New Collar work and align this construction with the company's financial and intellectual contributions to public-private schools, IBM's use of these schools to train New Collar workers, and employ New Collar workers in service of governmental and private business opportunities to capitalize on IBM's renewed corporate strategy. In this way, alongside downplaying dystopia and augmenting human autonomy, IBM seeks to increase its institutional autonomy by leveraging policy opportunities for competitive advantages in an intensifying cognitive capitalism. Ultimately, as will become clear, IBM's alignment of its

institutional autonomy with the logics of cognitive capitalism complicates the nature of human autonomy afforded to New Collar workers.

Before proceeding to the next section, a brief summary of this section is in order. This section outlined the ways IBM worked to construct the concept of “New Collar” by first, downplaying dystopian associations with Watson and other advanced AI and, second, urging the use of “augmented intelligence” as a more adequate use of “AI” that stresses the ability of Watson to augment the intelligence and autonomy of human beings. This strategy transpires through a reworking of distributed cognition whereby IBM attempts to re-center human beings by positioning Watson as the driver of human augmentation, an augmentation that is neither posthumanist nor transhumanist and instead stresses the potential for humans to flourish in the present moment. Watson, as a cognitive system built from cognitive computing, epitomizes this reworked distributed cognition, offering cognition as an intellectual force at hand for human mastery, as opposed to more egalitarian notions of distributed cognition specific to posthumanist theory. Ultimately, cognitive products and services enabled through Watson evidence, for IBM, the fruits of human autonomy made possible by downplaying dystopia and augmenting autonomy.

3.11 Mapping the New Collar Jobs Act

Whereas the previous section outlined importance of worker autonomy to the conceptual construction of New Collar and its relevance to presiding policymakers, this section outlines the particular provisions of the New Collar Jobs Act with IBM’s strategic attempts to leverage this type of worker autonomy for aligned corporate and political interests, thereby enabling IBM to enact greater autonomy as a company in a rapidly-shifting and turbulent marketplace. The stated goals of the New Collar Jobs Act are to “increase cybersecurity education and job growth,” as well as the unspecified designation “other purposes.”²⁵⁵ To achieve these goals, the Act proposes benefits for both New Collar workers and their

²⁵⁵ 115th U.S. Congress, *New Collar Jobs Act of 2017*, H.R. 3393, 2017, <https://www.congress.gov/bill/115th-congress/house-bill/3393>.

employers. For New Collar workers, the Act amends the 1965 Higher Education Act to enable debt cancellation for any employee who uses federal loans to pay for cybersecurity-related education and training, contingent upon “3 years (36 months) of consecutive non-default payment, continual employment in a cybersecurity job during this period wherein the job is located in an economically distressed area or requires the work to perform at least 60% of their duties in an economically distressed area.”²⁵⁶

For employers of New Collar workers, the Act amends the federal tax code to allow employers to claim a tax credit on “qualified employee cybersecurity education expenses,” defined as costs incurred for contributing to the education of an employee who ultimately receives a “certificate or degree at the undergraduate or graduate level or industry-recognized certification.”²⁵⁷ “Industry-recognized certification” includes certification related to “specialty areas” and “work roles” listed in the National Initiative for Cybersecurity Education (NICE)’s Cybersecurity Workforce Framework. A specialty area is a type of “concentrated work, or function, within cybersecurity and related work,” formalized as 32 distinct specialty areas designated in the Framework.²⁵⁸ A work role is a specific grouping of cybersecurity and related work, including knowledge, skills, and ability (KSA) necessary to perform such work.²⁵⁹ Thus, per the language of the New Collar Jobs Act and the Cybersecurity Framework, the criteria for an “industry-recognized certification” includes certifications broadly understood as bearing some relation to one of the specialty areas, a work role, or any of its constitutive knowledges, skills, and abilities.²⁶⁰ Additionally, businesses that claim the cybersecurity education credit can receive an increased evaluation score (5%) when competing for government contracts in excess of \$5 million.²⁶¹

²⁵⁶ Ibid.

²⁵⁷ Ibid.

²⁵⁸ National Initiative for Cybersecurity Education, *Cybersecurity Workforce Framework*, NIST Special Publication 800-181, 2017, <https://www.nist.gov/itl/applied-cybersecurity/nice/resources/nice-cybersecurity-workforce-framework>.

²⁵⁹ Ibid.

²⁶⁰ The Framework dedicates 35 pages to typifying these KSAs.

²⁶¹ 115th U.S. Congress, *New Collar Jobs Act*.

The alignment of these employer-based provisions with interrelated IBM ventures in the areas of education and cybersecurity, alongside the concomitant interrelation of Watson with these ventures, offer insights into IBM's attempts to navigate transformations to its business model and technological marketplaces with agility and supremacy. It is an attempt, in other words, to enliven its institutional autonomy. Whereas the preceding section detailed IBM's construction of "New Collar" as a paradigm indicative of augmented autonomy for human workers (transpiring through Watson and the evacuation of dystopian motifs and myths associated with AI such as Watson), this section details IBM's attempts to increase its autonomy by positioning the company as unilaterally capable of training and hiring New Collar workers for job roles and skills critical to contemporary marketplaces and issues of pressing national concern (i.e. cybersecurity). My mapping of the New Collar Jobs Act correlates the Act's provisions with IBM's investments in targeted areas of vocational training and cybersecurity, as well as IBM's designation of a contemporary era of cognitive computing, an era that is both the result of IBM's ingenuity with Watson and an era emblematic of IBM's ability to heighten its self-determination among technological, economic, and cultural forces.

3.12 Mapping the New Collar Jobs Act: IBM and the Cognitive Era

But even as Rometty attempts to avoid the rhetorical signifiers suggestive of hype cycle prototyping, her typology of the cognitive era – and Watson as the progenitor of this era – leans into what Evgeny Morozov refers to as epochalism, an intellectually fallacy supposing an "exceptional era of unprecedented opportunity due to the emergence and widespread availability of sophisticated technological systems."²⁶² Espousers of epochalist rhetoric, however, are driven by more than opportunities for lucrative marketplace ventures. As Morozov notes, epochalists believe their own epochalism,²⁶³ a sincerity

²⁶² Evgeny Morozov, *To Save Everything, Click Here: The Folly of Technological Solutionism*, (Public Affairs, 2013): 36.

²⁶³ *Ibid* 45.

that informs Rometty's evangelism for Watson, IBM, and the company's significance as a driving force behind and within the emerging cognitive era. While IBM externalizes the notion of the cognitive era as one of emerging technological and business opportunities, the cognitive era is also something of a belief system guiding the fervency and machinations through which IBM advocates for its ventures, technology, and institutional prowess.

The New Collar Jobs Act is a significant moment in IBM's attempts to realize the fruits of its institutional prowess in the cognitive era, one that corresponds to the company's attempts to maximize its institutional autonomy. Thus, this section draws on IBM's use of "cognitive" as outlined in the preceding section to correlate the provisions of the New Collar Jobs Act with IBM's attempt to capitalize on the logics of an intensified "cognitive capitalism." Cognitive capitalism is a contemporary iteration of capitalist production predicated on knowledge as a process and outcome of production, leveraging the minds of workers as the "machine of production, generating profit for owners who have purchased, with a wage, its thinking power."²⁶⁴ Value is produced from "processes of creativity, communication, expression, artistry, innovation and 'fun,'"²⁶⁵ generating outputs with economic value and imbued with social values that accord esteem to these processes and workers capable of their undertaking. In this way, cognitive capitalism also describes a "broad organizational principle of contemporary society."²⁶⁶ As we will see, IBM's political and institutional maneuvering not only epitomizes the logics of cognitive capitalism; IBM intensifies these logics by engendering circumstances that allowed the company to economically capitalize on the training and creation of New Collar workers, particularly those capable of leveraging Watson to address cybersecurity concerns.

²⁶⁴ Nick Dyer-Witheford and Greig De Peuter. *Games of Empire: Global Capitalism and Video Games*, (U of Minnesota Press, 2009): 36-37.

²⁶⁵ Jussi Parikkai, "Cultural Techniques of Cognitive Capitalism: Metaprogramming and the Labour of Code," *Cultural Studies Review*, 20, no. 1 (2014): 35-36.

²⁶⁶ George Tsogas, "The Commodity Form in Cognitive Capitalism," *Culture and Organization*, 18, no. 5 (2012): 377-383.

From 2011 to 2017, alongside the centrality of Watson in the IBM corporate portfolio, IBM increasingly invested in vocational training for emerging New Collar workers, advocated for public-private educational models to train New Collar workers, and stressed New Collar training and work as uniquely capable of alleviating cybersecurity dilemmas. While the provisions of the New Collar Jobs Act are not specific to IBM as an institution, they closely align with IBM ventures around vocational training and cybersecurity and, more importantly, position the company to receive tax credits for economic investments in ventures poised to accelerate through the year 2020.

Ultimately, I will return to the question of New Collar worker autonomy and cognitive outcomes addressed in the preceding section. First, however, it is necessary to understand how IBM's investments in vocational training of New Collar workers for competencies related to cybersecurity correlate with the provisions of the New Collar Jobs act and, through this correlation, evidence success of IBM's maneuverability in the cognitive era, thereby clearing the way for IBM to operate with heightened degrees of autonomy. In what follows, I not only draw out IBM's strategies for aligning the company's ventures with political mindsets in cognitive capitalism, but also complete the conceptual mapping of "New Collar," as these provisions also closely correlate with IBM rhetoric that downplays traditional dichotomies of labor and collegiate education as insufficient for marketplace success in the cognitive era. Thus, these provisions are very telling about IBM's institutional autonomy, the conceptualization of New Collar, and the economic and social values driving economic and political ideologies, as well as the instantiation of such ideologies in legal code. Beyond legal encoding, IBM's forays into education stress skills and competencies with computer code as necessary for New Collar workers to compete in IBM's cognitive era.

3.13 Mapping the New Collar Jobs Act: IBM, P-Tech, and Vocational Training

In September 2011, approximately half a year after Watson's *Jeopardy!* appearance, IBM collaborated with the New York City Department of Education, the City University of New York, and New York City College of Technology to open Pathways in Technology Early College High School (P-TECH), a New

York City public high school. While P-TECH initially referred to this particular New York City school, P-TECH now refers to a public-private partnership model for integrated high school and college education, a model that prioritizes creating direct pathways for jobs that require advanced computational skills. After six years of training, P-TECH students earn (free of charge) an associate degree in computers or cognate STEM fields reflective of “skills and knowledge they need to continue their studies or step easily into high-growth, ‘new collar’ jobs.”²⁶⁷ As of 2017, more than 80 P-TECH schools operate around the world, including 50 across six U.S. States.²⁶⁸ According to the P-TECH website (developed by IBM and collaborators from the New York state education and university systems), the majority of P-TECH funding comes from local school districts, alongside federal funding earmarked for Career & Technical Education (CTE) schools through the Carl D. Perkins Act and college course costs covered by a range of potential funding options (such as philanthropic donation or college tuition waivers).²⁶⁹

As IBM notes on the “Key Issues” page of its THINKPolicy blog, the Carl D. Perkins Act is a policy priority for IBM, one that overlaps with other priorities for cybersecurity and corporate tax reform, each of which envelops rhetoric around P-TECH, New Collar jobs, and/or supply-side job creation. The Carl D. Perkins Act provides federal funding to states and other grantees for the purposes of enhancing career and technical education (CTE) programs and skillsets gained through CTE programs. By supporting the Carl D. Perkins Act, IBM’s seeks to maintain incentives for its efforts to improve the “educational pipeline for future skills through Perkins CTE and P-TECH...career-focused schools,” and orient this pipeline towards New Collar job training focused on “current skills that do not necessarily require a bachelor’s degree, but instead prioritize capabilities over credentials.”²⁷⁰ IBM’s “Key Issues” for policy also include

²⁶⁷ IBM, “P-TECH: When Ambitions Meets Opportunity, Success Happens,” <https://www.ibm.com/thought-leadership/ptech/index.html>.

²⁶⁸ CollegeBoard, “College Credit in High School – Working Group Report,” <https://secure-media.collegeboard.org/pdf/research/college-credit-high-school-working-group-report.pdf>.

²⁶⁹ “P-Tech 9-14 Schools are Funded Through a Variety of Mechanisms,” <http://www.ptech.org/model/supporting-and-funding-ptech-schools>.

²⁷⁰ “Key Issues,” IBM THINKPolicy, <https://www.ibm.com/blogs/policy/key-issues/>.

reforming the corporate tax code to “promote investment, job creation, and keep American companies competitive,” alongside “non-regulatory, voluntary” approaches to cybersecurity, such as IBM’s declaration that its “cognitive security products will also create New Collar jobs that demand skills, knowledge, and creative thinking to outsmart cyber criminals.”²⁷¹

IBM’s policy priorities significantly correlate with provisions of the New Collar Jobs Act for vocational training and skills, job creation and staffing, and computational competencies underpinning cybersecurity. The “Key Issues” page also shines a light on the role of tax reform and credits simultaneously incentivizing IBM’s contributions to P-TECH schools and IBM’s monetization of such investments. Tax credits for media and technology companies tend to arise from political ideologies about corporate investment as the source of job creation, technological innovation, and spurs for wider economic sustainability. As Vicki Mayer notes in her analysis of the 2002 Louisiana Motion Picture Incentive Act, tax credit policies aimed at availing media companies of public coffers were rationalized on the grounds that supply-side economic strategies would create a “self-sustaining satellite of the Hollywood film economy” eventually capable of offsetting losses to municipal funds.²⁷² Likewise, political ideologies and machinations often envision the role of policy as a facilitator of private-sector enterprise. Hector Postigo notes the Information Infrastructure Task Force (IITF) was tasked with not only developing information and telecommunication policy, but with objectives that included tax incentives, protections for intellectual property, and allowing businesses to guide infrastructure innovation.²⁷³ Much like tax benefits accorded to Hollywood, media, and infrastructure companies, IBM’s investment in P-TECH and New Collar training situates the company in a privileged position to gain an economic windfall via tax credits, creating a de facto monetization of P-TECH and New Collar training.

²⁷¹ Ibid.

²⁷² Vicki Mayer, *Almost Hollywood, Nearly New Orleans: The Lure of the Local Film Economy* (University of California Press, 2017): 2.

²⁷³ Hector Postigo, *The Digital Rights Movement: The Role of Technology in Subverting Digital Copyright* (MIT Press, 2012): 20.

3.14 Mapping the New Collar Jobs Act: IBM and New Collar Training Incentives

Even though IBM claims it does not directly donate money to P-TECH schools, and also describes its support of P-TECH as part of its “philanthropic portfolio,”²⁷⁴ estimates from 2015 indicate IBM spends over \$1 million on curriculum development, training programs, internships, and employee involvement.²⁷⁵ In early 2018, IBM donated \$25,000 to establish the “Stanley Litow P-TECH Scholarship,” a fund named after IBM vice president emeritus of the IBM International Foundation and co-founder of P-TECH.²⁷⁶ The scholarship is administered by the SUNY Impact Foundation, meaning IBM did not give money to P-TECH schools directly, yet nonetheless made funding available through the SUNY intermediary.²⁷⁷ Thus, beyond IBM’s hand in curriculum development and donation of employee time, IBM’s investment in P-TECH is also monetary, even if this investment does not travel along a direct pipeline from IBM to a single school or school system. These types of investments are poised to increase, as in late 2016, less than one month after Rometty’s letter to Trump, the IBM CEO indicated the company plans to invest \$1 billion by 2020 to train and develop U.S. employees.²⁷⁸ While Rometty did not specify P-TECH as a recipient or beneficiary of these funds, the subsequent repetition of the “\$1 billion investment” talking point often appears in approximation to IBM’s promotion of P-TECH schools and the company’s focus on hiring New Collar workers, such as a THINK blog post that touts – under the heading “New Col-

²⁷⁴ “IBM and P-TECH,” IBM, <http://www-03.ibm.com/press/us/en/presskit/42300.wss>.

²⁷⁵ Issie Lapowsky, “IBM’s School Could Fix Education – And Tech’s Diversity Gap,” *Wired*, Aug. 24, 2015, <https://www.wired.com/2015/08/p-tech/>.

²⁷⁶ “SUNY Announces Annual Scholarship for NYS P-TECH Students in Trustee Stanley Litow’s Honor,” Jan. 23, 2018, <https://www.suny.edu/suny-news/press-releases/01-2018/1-23-18-ptech/stanley-litow-p-tech-scholarship.html>.

²⁷⁷ *Ibid.*

²⁷⁸ Ginni Rometty, “We Need to Fill ‘New Collar Jobs that Employers Demand: IBM’s Rometty,” *USA Today*, Dec. 13, 2016, <https://www.usatoday.com/story/tech/columnist/2016/12/13/we-need-fill-new-collar-jobs-employers-demand-ibms-rometty/95382248/>.

lar jobs” - IBM’s pioneering of P-TECH schools, followed immediately by \$1 billion training and developing talking point, and followed immediately again by a pronouncement reinforcing IBM’s commitment to New Collar hiring and training.²⁷⁹

Where the mind of the worker is the machine of production in cognitive capitalism, IBM’s investments in New Collar training redoubles the modalities of this production, creating circumstances whereby the mind of the workers is both the machine of production and what is produced. In their analysis of EA Sports as a company indicative of cognitive capitalist logics, Dyer-Witthford and de Peuter note EA’s increasing presence on college campuses as symptomatic of the company’s attempts to both align its corporate interests with on-campus recruitment efforts and transform its corporate facilities into spaces exuding a collegiate atmosphere at a distance remove from factory-style work.²⁸⁰ Whereas three out of every four of EA’s new recruits were college graduates, and EA sought a stronger footprint on college campuses,²⁸¹ IBM’s stake in training of New Collar workers supersedes mere recruitment from third-party institutions and provides the company with a direct hand in curriculum development, interpersonal trainee interaction, and a mode of producing New Collar workers who can then produce innovative and ameliorating outputs, notably when these trainees transition directly from P-TECH to IBM employment.

Per the provisions of the New Collar Jobs Act, IBM can conceivably claim a tax credit on these investments (or “amounts paid or incurred” as stipulated in the Act’s language) when P-TECH trainees and/or graduates are employed by IBM. Under such circumstances, IBM’s institutional autonomy flourishes on the backs of the company’s ability to intensify the logics of cognitive capitalism by not only capitalizing on the minds and outcomes of New Collar workers, but by monetizing the conditions of their

²⁷⁹ Sam Ladah, “Building IBM’s Workforce of the Future,” IBM THINK Blog, July 12, 2017, <https://www.ibm.com/blogs/think/2017/07/workforce-of-the-future/>.

²⁸⁰ Dyer Witthford and de Peuter, *Games of Empire*, 56.

²⁸¹ Ibid 53.

training and employment. If cognitive capitalist emerges from a “knowledge-based economy framed and subsumed by the laws of capitalist accumulation,”²⁸² and its continued development can only be achieved through “institutional arrangements governing its activities, relationships, and property rights,”²⁸³ IBM’s prowess in correlating institutional arrangements across public sectors (school districts, university systems), policymaking bodies (U.S. congress), and knowledge-based activities and professional relationships transpiring through IBM property (New Collar workers trained to enhance and leverage Watson) evidences a cognitive capitalist accumulation preferential to – and driven at least partly by – IBM’s institutional maneuvering. When IBM touts the success of P-TECH to create New Collar workers, particularly those who transitioned from P-TECH trainees to IBM employees, the company both makes a case for continued policy support of its ventures and evidences success of support already granted.

3.15 Mapping the New Collar Jobs Act: IBM and New Collar Employment

Shortly before the introduction of the New Collar Jobs Act, a June 2017 IBM THINKPolicy blog post profiled five P-TECH graduates from the first full cycle of trainees to complete the P-TECH program. Described as “skilled, confident, and ready for the New Collar Jobs of the 21st Century,” each graduate shared two common traits: they completed grades 9-14 of the “six-year” program in less than six years and each now works for IBM as a New Collar employee.²⁸⁴ A Citizen IBM blog post from earlier in the years similarly stresses the success of P-TECH’s ability to as graduate, train and, in many cases, employ recent graduates with IBM as New Collar workers. In addition to touting the success of these graduates, the post leverages this success to make the case for continued policy support of P-TECH schools, noting P-TECH’s achievements “inspired unprecedented bipartisan Congressional support” for the Perkins Act’s

²⁸² Carlo Vercellone, "From formal subsumption to general intellect: Elements for a Marxist reading of the thesis of cognitive capitalism," *Historical Materialism* 15, no. 1 (2007): 14.

²⁸³ Yann Moulier-Boutang, *Cognitive Capitalism* (Polity, 2011): 58.

²⁸⁴ “P-TECH Graduates Ready for New Collar Jobs,” IBM THINKPolicy, June 1, 2017, <https://www.ibm.com/blogs/policy/p-tech-graduates-ready-new-collar-jobs/>.

CTE funding and gesturing towards IBM's anticipation of the Act's continued authorization.²⁸⁵ The post also anticipates questions about public investments in these schools, implicitly accounting for the benefit to taxpayers and the public at large, while implicitly making the case for further policy initiatives (such as the New Collar Jobs Act) incentivizing IBM's investment in P-TECH and New Collar training:

What will America get for this money? We'll get state-determined 21st century CTE programs that meet today's (and tomorrow's) demands for rigor, relevance and accountability. We'll stop training our young people for jobs that either don't exist or pay low wages. And we'll pioneer the collaborations among educators, business and government that are essential to maintaining a strong economy with a strong middle class. With new collar job growth outpacing that of low-paying service-industry jobs – and 99 percent of new, post-recession jobs going to workers with at least some college education – programs like P-TECH will open the door to opportunity for anyone from any background who has the drive to succeed.”²⁸⁶

References to outdated training modalities for non-existent or low-paying jobs alongside the public-private model driving P-TECH's ability to close the “skills gap’ between 21st century labor market demands and a generation's ability to meet those demands”²⁸⁷ pulls together discursive threads corresponding to IBM's attempts to galvanize policy initiatives for P-TECH and related models. In doing so, IBM stresses the inadequacy of traditional collegiate education, New Collar as a job class superseding its predecessors in the ability to address this “skills gap,” and IBM's ability to capitalize on New Collar skills for cybersecurity outcomes.

²⁸⁵ Rashid Ferrod Davis, “IBM P-TECH: Helping Graduates Blaze Diverse Pathways to Success,” Citizen IBM Blog, Jan. 4, 2017, https://www.ibm.com/blogs/citizen-ibm/2017/01/davis_dec_2017_p-tech_grads/.

²⁸⁶ Ibid.

²⁸⁷ Ibid.

The utility of media and technology policies often tend to turn on questions of whether or not such policies will create jobs, whether or not such policies function as job-creation engines, and whether or not such creation is sustainable. As Susan Crawford notes in her historical account of the NBC-Comcast merger, one of the primary questions asked by the Senate Antitrust Subcommittee when considering the proposed Comcast-NBC merger was “will it create or destroy jobs?”²⁸⁸ Likewise, the enactment of the 2002 Louisiana Motion Picture Incentive Act marshaled notions that any film policy is (or should be) a de facto jobs policy.²⁸⁹ As these works indicate, the ability to drive favorable policy outcomes for media and technology companies is highly dependent on the ability to convincingly situate industrial practices as engines of ongoing job creation and a vicarious means of accelerating economic growth through consumer spending and progressive taxation. To assert the autonomy of humans to more reliably determine employability and productivity is to speak a policy language that hears this type of autonomy as conditions highly favorable to the presiding economic worldview of policymakers. IBM’s urging of policies aimed at financially undergirding P-TECH and other CTE programs as a means of training and employing New Collar workers anticipates these questions. More critically, however, stressing an existing “skills gap” between the number of sufficiently-trained New Collar workers and the number of unstaffed jobs in areas critical to business and national interests adds a sense of urgency to IBM’s discourse. Through this urgency, IBM’s evocation of a “skills gap” both poses the problem and offers P-Tech as the solution, one traditional educational models and labor categories are ill-prepared to address, particularly in the area of cybersecurity.

²⁸⁸ Susan P. Crawford, *Captive Audience: The Telecom Industry and Monopoly Power in the New Gilded Age* (Yale University Press, 2013): 4.

²⁸⁹ Mayer, *Almost Hollywood*, 15.

3.16 Mapping the New Collar Jobs Act: IBM and Cybersecurity

In Feb. 2017, an IBM press release announced the availability of Watson for Cyber Security as part of the company's Cognitive SOC (security operations center) platform. Cited as the first augmented intelligence technology powering SOCs, Watson augments a security analyst's ability to "fill gaps in intelligence and act with speed and accuracy," based on Watson's year-long intake of security documents to learn the language of cybersecurity.²⁹⁰ Where this press release addresses a gap between a security analyst's ability to quickly decipher and respond to vast complicated streams of data, a May 2017 IBM white paper aims at "addressing the cybersecurity skills gap with a new collar approach."²⁹¹ The paper begins with a "state of the skills gap," including research indicating nearly 2 million positions will be unfulfilled by 2022 due to a paucity of qualified professions, additional research indicating 75% of cybersecurity professionals believe the government underinvests in cybersecurity professionalization, and the inability of universities and community colleges to evolve curriculum, shift to meet job-market demands, and employ sufficient numbers of qualified teachers and professors.²⁹²

To alleviate these quandaries, IBM recommends public and private organizations consider P-TECH and similar vocational-oriented educational models to train New Collar workers. IBM further recommends businesses prioritize hiring New Collar workers, since "a new collar approach focuses on skills – not degrees earned," and the skills to perform complex cybersecurity tasks demand specific training but "do not necessarily require a university degree."²⁹³ Ultimately, the white paper typifies New Collar roles as many of the roles listed in the NICE Framework, such as integration engineer, threat monitoring analyst, and security device analyst.²⁹⁴ In this white paper, IBM not only rigorously aligns its advocacy for P-

²⁹⁰ "IBM Delivers Watson for Cyber Security to Power Cognitive Security Operations Centers," IBM, Feb. 13, 2017, <https://www-03.ibm.com/press/us/en/pressrelease/51577.wss>.

²⁹¹ *It's Not Where You Start – It's How You Finish*, IBM Institute for Business Value, May 2017, <https://public.dhe.ibm.com/common/ssi/ecm/gb/en/gbe03830usen/GBE03830USEN.PDF>.

²⁹² *Ibid.*

²⁹³ *Ibid.*

²⁹⁴ *Ibid.*

TECH and New Collar workers with cybersecurity roles, but also employs a tactic used elsewhere to champion the technological prowess and social utility of New Collar workers: downplaying both four-year college degrees and associated labor categories.

3.17 Mapping the New Collar Jobs Act: Downplaying Degrees and Labor Dichotomies

Alongside investing in – and advocating for – PTECH, IBM decries the focus on four-year university and collegiate degrees as both antiquated and inadequate, since degree-based programs tend to focus on the degree as the sole outcome at the cost of fostering skillsets applicable for business and social solutions. Often occurring in tandem with downplaying degree-based education, IBM also downplays the use of “white collar” and “blue collar” in deference to the contemporaneous preferability of “New Collar.” Similar to the way IBM plays up Watson as an augmentative force for human autonomy by downplaying dystopian and mythic connotations with AI, downplaying degree-based education and traditional dichotomies of labor enables the company to posit the P-TECH model as a salve for the inadequacy of degree-based education to close the skills gap. The sub-heading for IBM’s New Collar landing page describes New Collar as “about skills, not degrees,” IBM’s shorthand for promoting P-TECH and its skills-oriented vocationalism as more adept at resolving the skills gap and filling critical jobs roles.²⁹⁵ Likewise, shortly after Rometty’s Nov. 2016 letter to President-elect Donald Trump, the IBM CEO penned a column for *Time* magazine advocating for the creation of New Collar jobs, touting the P-TECH model, and ending with what would become a persistent talking point for IBM: “the future of job creation is no longer white collar vs. blue collar. It’s new collar.”²⁹⁶

This talking point appears again in Rometty’s Dec. 13, 2016 *USA Today* op-ed, reiterating a slight variation on this talking point while also stressing that New Collar jobs do not necessarily require a four-

²⁹⁵ “What is New Collar,” IBM, https://www-03.ibm.com/employment/us/new_collar.shtml.

²⁹⁶ Ginny Rometty, “How To Create ‘New’ Collar Jobs,” *Time*, Dec. 1, 2016, <http://time.com/collection-post/4587758/how-to-create-new-collar-jobs/>.

year college degree and one-third IBM employees do not possess such a degree, since “what matters most is these employees...have relevant skills, often obtained through vocational training.”²⁹⁷ An IBM THINKPolicy blog post by IBM’s Vice President of Human Resources collapses these “collar” and “skills” talking points into a more pithy takeaway, indicating many IBM employees’ roles are not “white collar or blue collar, they’re New Collar jobs – where skills matter more than degrees.”²⁹⁸ Although completion of P-TECH programs lead to both a high school and associate degree, for IBM these degrees signify particular skills for particular jobs in fulfillment of particular tasks in the contemporary moment, as opposed to the traditional association of white collar with generalized intellectual skills for office work and blue collar with generalized skills for manual labor. In this way, the conceptualization of “New Collar” borrows from both aspects of blue and white collar, as New Collar work demands an intellectual rigor suggestive of white collar work combined with a hands-on, manual taskmastery associated with blue collar work. But for all that New Collar borrows from white collar and blue collar, it elides much more, as New Collar work entails a division of labor and outputs of this labor that intensify IBM’s mode of cognitive capitalism with respect to both New Collar work and the workers themselves. If New Collar workers augment their autonomy through Watson and IBM’s corporate machinations, this autonomy is one that can only transpire at the behest of IBM. By situating autonomy as potentialized only through the company’s modes for training and upskilling, the augmentative capacities of its proprietary technology, and outcomes favorable to IBM third-party B2B clients, New Collar autonomy is an autonomy valued as the sole province of IBM, a worker autonomy extractable and fungible for an IBM corporate autonomy seeking economic latitude in cognitive capitalism.

²⁹⁷ Rometty, “We Need to Fill ‘New Collar Jobs.’”

²⁹⁸ Sam Laddah, “The Tech Industry is Evolving, It’s About Time Hiring Evolved With It,” IBM THINKPolicy, Aug. 2, 2017, <https://www.ibm.com/blogs/policy/tech-industry-hiring-new-collar/>.

3.18 Mapping the New Collar Jobs Act: Reinventing Worker Collars

IBM's opportunities to capitalize on the cognitive capacities of its workers include not only training, employment, and the alignment of New Collar work with policy and marketplace opportunities (i.e. The New Collar Jobs Act and cybersecurity), but the esteem and dignity New Collar workers accord to the outcomes they produce through their advanced skillsets. By both borrowing from and superseding traits associated with blue collar and white collar, as well as their associations with vocational upskilling and collegiate intellect, IBM advances New Collar work as a cognitive labor both invigorating and subsuming the energies put into this work. In this way, the relationship between IBM's inducement of augmented worker autonomy and IBM's institutional autonomy collides and repels along a cognitive division of labor divesting from New Collar workers the autonomous energies fostered by IBM.

Labor in cognitive capitalism transcends industrial labor's dependence on blue collar manual labor undertaking routinized work functions.²⁹⁹ New Collar labor also transcends white collar labor, as New Collar skills defy the generalized knowledge accrued from four-year college degrees as applied to generalized sets of intellectual tasks administered as "office work." In its attempts to capitalize on the benefits of training and employing New Collar workers, IBM's profiles of New Collar workers depict New Collar work as an avenue for satisfaction, esteem, and opportunity unaccommodated by white and blue collar work. In this way, IBM's profiling of New Collar employees epitomizes a "cognitive labor," work performed not only *with* advanced intellectual capacities, but *as* advanced intellectuality, one that often portends an "enrichment of experience" stemming from the application of such intellect.³⁰⁰ Profiles of New Collar workers on THINKPolicy posit the enrichment of experience New Collar workers feel when given opportunities by IBM to apply their craft and grow their professional opportunities. This enrichment of experience plays out through a "reinvention" motif in which New Collar workers reinvented

²⁹⁹ Moulier-Boutang, *Cognitive Capitalism*, 68.

³⁰⁰ Franco Berardi, *The Soul at Work: From Alienation to Autonomy* (Semiotext (e), 2009): 86-87.

themselves as skills-oriented professionals, often after becoming disenchanted with the unviability of four-year degrees as a gateway to a viable career.

Rey Lozano, an IBM New Collar worker who left college after two semesters because “coursework wasn’t helping him build skills that would translate to a career,” and became fed up with minimum-wage fast food jobs, reinvented himself by joining IBM in 2014. He quickly climbed the corporate ranks to move from a member of a technician team to eventually leading a team as a senior technician.³⁰¹ Looking back on that period, he cites as unimaginable the experience and knowledge he now possesses, as well as the professional and lifestyle opportunities IBM affords: “Now I can live comfortably and have opportunities to grow my career...all because I found the opportunities to try something new, and took a chance.” New Collar worker Cecilia Schartiger struggled to transform her four-year degree in early childhood education into a full-time teaching position, and therefore decided to alter her trajectory towards cybersecurity, ultimately landing a cybersecurity job with IBM in 2016. Her commitment to “restless reinvention” (inspired by a Ginny Rometty maxim about the importance of reinvention) enabled her to understand a degree does not “define or limit a person to one career,” and by committing herself to reinvention was able to “embark on a new career in technology – a field with some of the fastest growing opportunities in the country.”³⁰² This reinvention motif, its transcendence of narrowly-defined degree-based opportunities, and the ability of IBM to enable this reinvention and open the door for unrealized vistas of professional opportunities, also plays out in profiles of a creative writer turned IBM New Collar developer,³⁰³ and IBM’s “first New Collar worker,” who continually reinvented himself (beginning

³⁰¹ “Taking a Chance on a New Collar Career,” IBM THINKPolicy, Feb. 15, 2017.

³⁰² Cecilia Schartiger, “Cecilia Schartiger: My New Collar Journey,” IBM THINKPolicy, Jan. 20, 2017, <https://www.ibm.com/blogs/policy/cecilia-schartiger/>.

³⁰³ “Writing a New Collar Story, In Code,” IBM THINKPolicy, Feb. 10, 2017, <https://www.ibm.com/blogs/policy/writing-new-collar-story-code/>.

with his first IBM jobs in 1978) by progressively advancing his skillsets and therefore engendering better opportunities within IBM.³⁰⁴

On one hand, this reinvention motifs offers evidence of IBM's inventiveness as a catalyst of job training, creation and fulfillment – a fulfillment in which IBM is able to fill unstaffed roles with emerging New Collar workers and offer fulfilling careers. The reliance of this fulfillment on one company's modalities for training and employment also, on the other hand, offers caution as to the larger stakes around IBM's intensification of cognitive capitalism. While cognitive labor can, under some circumstances, induce a sense of enrichment and fulfillment, cognitive labor also risks reinventing these qualities as a crass "economic necessity" that transforms enriching experiences into a "joyless fiction."³⁰⁵ This significance of this risk, however, is greater than any one New Collar worker's joylessness, as the cognitive outcomes of New Collar workers evidence the structural intensification of IBM's cognitive capitalism, its institutional autonomy, and the tension among these autonomous conditions.

3.19 Mapping the New Collar Jobs Act: IBM Institutional Autonomy and New Collar Autonomy

The mention of "cognitive outcomes" returns us to the questions posed at the end of the preceding section regarding what these outcomes portend for the augmented autonomy of New Collar workers and IBM's institutional autonomy, especially in light of this section's correlation of the New Collar Jobs Act's provisions with IBM's monetization of New Collar training, hiring, and outputs. On one hand, cognitive outcomes such as a cognitive trailer or cognitive song offers evidence of the creative and market viability of New Collar workers and their skillsets. On the other hand, alongside the flourishing of New Collar autonomy, the esteem and energies New Collar workers invest in work performed through Watson and other IBM technologies and cognitive outcomes entails a situation in which IBM has captured all

³⁰⁴ "Four Decades. Nine Jobs. One Company. Meet Albert, IBM's First-Ever New Collar Employee," IBM THINKPolicy, Jan. 22, 2018, <https://www.ibm.com/blogs/policy/career-reinvention-new-collar/>.

³⁰⁵ Berardi, *The Soul At Work*, 87.

forms of New Collar intelligence, from training to employment to work performance to cognitive outcomes. When understanding how these outcomes function as commodities in cognitive capitalism, it becomes clear how the procedures emboldening IBM's institutional autonomy enables New Collar worker autonomy to flourish and, ultimately, become restricted to the institutional and marketplace purviews of IBM.

The objective of cognitive labor is the "production of new knowledges that can feed innovation upstream" wherein knowledge is not only produced and marshaled towards innovation, but all forms of intelligence are captured.³⁰⁶ Understood as commodities in cognitive capitalism, cognitive outcomes impart a sense of both economic and social value, particularly the qualities of New Collar workers "transposed and enshrined into the body of a commodity,"³⁰⁷ qualities such as the esteem New Collar workers accord to vocational training, skillsets, and IBM, as well as the intelligence driving these skillsets and the skillsets themselves. In this way, the social value of cognitive commodities "reflects not only the social relationships that exist among those who worked in production...but also the exceptional and numerous cognitive qualities that are embedded in it through us."³⁰⁸ If the dual character of commodities in cognitive capitalism entails a differentiated economic value based on the social reputations and esteems associated with these commodities,³⁰⁹ value is doubly differentiated when IBM avails itself of economic values from training to output and the social values "embedded in commodities as they travel through their production processes."³¹⁰

IBM's intensification of cognitive capitalism entails the capture of all intelligence as both economic and social value when New Collar workers undertake production processes enabled by IBM's monetiza-

³⁰⁶ Moulier-Boutang, *Cognitive Capitalism*, 72.

³⁰⁷ Tsogas, "The Commodity Form," 389.

³⁰⁸ Ibid 392.

³⁰⁹ Ibid 390.

³¹⁰ Ibid 391.

tion of training and the cognitive outcomes of this training. Where New Collar work is predicated on cognitive capitalism's "economies of learning" wherein laboring energies necessitate an unceasing anticipation and accommodation to rapidly-shifting demands of the market,³¹¹ IBM's capitalization on this anticipates and captures learning and its intellectual outputs across a nexus of institutional and laboring paradigms. In other words, IBM's economic investment in New Collar workers is a means of engendering social values around education and training, skills and performance, professionalization and careerism, outcomes and commodities that are again captured by IBM for their economic value. The scale of IBM's institutional autonomy, then, far surpasses the autonomy afforded to New Collar workers, especially since this autonomy is at hand for IBM's productive value.

New Collar workers, in this sense, embody the "social corporeality of cognitive labor"³¹² in which "high tech workers invest their specific competences, their creative, innovative and communicative energies in the labor process," the "best part of their intellectual capacities" unceasingly at hand for IBM across institutions, paradigms, and milestones in training, production, and outcomes. These intellectual capacities and social values remain the possession of IBM in the form of intellectual protections around technologies and outcomes performed through these technologies (i.e. using Watson to generate a cognitive trailer), and are thus inexhaustible even as the corporeality of New Collar workers is subject to physical and mental exhaustion.

3.20 Conclusion

The discrepancy between economic and social values afforded to IBM and economic and social values alternately afforded to and extracted back from New Collar workers correlates with this chapter's detailing of autonomy as a condition among both New Collar workers and IBM. To the extent that New Collar

³¹¹ Moulier-Boutang, *Cognitive Capitalism*, 69.

³¹² Berardi, *The Soul At Work*, 105.

workers are able to augment their autonomy, this augmented autonomy transpires only through the parameters set forth by IBM, parameters that ensure this autonomy and its associated social values are transformed into economic value for IBM. The New Collar Jobs Act corresponds to this logic, as the provisions enable remuneration for both employer and employee, since the ability for New Collar workers to claim loan forgiveness is tied to duration of employment. Thus, as with the autonomy of IBM in relation to New Collar workers, the provisions of the New Collar Jobs Act entails a twofold benefit to employers such as IBM: employers are the beneficiaries of tax credits for training New Collar workers and also benefit from the stipulation incentivizing workers to remain employed to a company for 3 years if they want to become eligible for federal loan forgiveness. It is, in other words, a policy that benefits employers first, even when employees are the intended direct beneficiary. To the extent that New Collar workers can heighten their autonomy, it is a heightening prefigured, enabled, and monetized by IBM and corresponding political mindsets, a cognitive era in which autonomy is not the sole province of an autonomous technology such as Watson but, rather, exchanged in uneven proportionality among corporate power, its interrelationship with public institutions, and the reinvention of working classes.

4 AMAZON'S ALEXA

Elon Musk insists Space X will one day take us all to Mars. For Jeff Bezos, on the other hand, MARS is the earth-bound province of an elite few. MARS is Amazon CEO Bezos' highly-exclusive showcase of cutting-edge Machine Learning, Home Automation, Robotics, and Space Exploration (MARS). Held annually (since 2016) at the Parker Hotel in Palm Springs, California, MARS is an invitation-only affair, often reserved for celebrities and tech luminaries such as Intel CEO Brian Krzanich, Dean Kamen (inventor of the Segway), and Adam Savage (star of the television show *Mythbusters*).³¹³ Despite its short lifespan, MARS has gained significant attention for ostentatious accoutrements and grandiose feats of technological spectacle, particularly those involving Bezos. At MARS 2016, Bezos donned a robotic suit resembling digitized jumpsuits from the film *Tron* (1982),³¹⁴ only to attempt at MARS 2017 to outdo himself by manning a robotic exoskeleton not unlike the colossal humanoid mechas in the film *Pacific Rim* (2013).³¹⁵ Independent of Bezos, robots at MARS also undertake quotidian feats, as each MARS event has included automated food and drink service by Amazon's Kiva robots, the same robots that perform automated storage and retrieval in Amazon warehouses. Likewise, at the inaugural 2016 MARS event, MIT demoed its Non-Anthropomorphic Bipedal Robotic System (NABiRoS). Despite the apparent non-anthropomorphic intention of NABiRoS' creators, pictures emerging from MARS 2016 show a NABiRoS robot adorned in an Amazon shipping box with a human smiley face drawn on one side.³¹⁶ The box stands in for a human head, while the long eyelashes of the drawn face connote as feminized, gendering an otherwise non-anthropomorphic device. While, for Bezos, MARS is an opportunity to embody larger-than-life

³¹³ Eugene Kim, "Amazon Had a Secret Invitation-Only Conference, where Jeff Bezos Showed Up in a Robotic Suit," *Business Insider*, Mar. 23, 2016, <http://www.businessinsider.com/photos-secret-amazon-robotics-conference-with-jeff-bezos-2016-3>.

³¹⁴ *Ibid.*

³¹⁵ Julie Bort, "Amazon Threw Another Invite-Only Robot Conference in Palm Springs Last Week," *Business Insider*, Mar. 28, 2017, <http://www.businessinsider.com/amazons-secret-invite-only-conference-in-palm-springs-last-week-2017-3>.

³¹⁶ Kim, "Amazon Had a Secret."

robotic contraptions, Bezos' company increasingly uses other promotional spaces, collaborations, and techniques to market its gendered Alexa technology alongside the company's hopes that Alexa will embody, for Amazon and its customers, the go-to consumer device for powering home automation.

4.1 What is Alexa?

Alexa is an automated personal voice assistant that interacts with humans through vocal commands and queries. Alexa is part of a broader class of virtual assistants that perform tasks or services for human users. The breadth of virtual assistants, their capabilities, and their uses accommodates a multitude of related and overlapping designations, including (but not limited to) "digital assistants," "intelligent assistants," and "voice assistants." Moreover, since voice is the primary means of interaction, designations of "voice-user interface" and "natural-language user interface" also apply to Alexa's modes of human-computer interfacing. As a software agent, Alexa is not exclusive to any particular hardware device, but is most commonly associated with Amazon's Echo smart speakers. While Alexa is not exclusive to the Echo, Alexa is the exclusive mode of interaction for Echo users. In this sense, Alexa is the primary appeal for Echo consumption, which may help explain Amazon's rapid ascent in the voice-controlled home speaker market. The Echo became publicly available in June 2015 and by May 2017 trade press reported Echo's dominance over rival Google Home, as Echo accounted for 70% market penetration among individuals who use a voice-enabled speaker at least once per month (compared to less than 24% for Google Home).³¹⁷ That same month, a widely-cited forecasting report indicated the number of digital assistants will grow to 7.5 billion by 2021, outnumbering the world population of humans.³¹⁸ By the following year, 2022, 70 million households are projected to have at least one voice-powered speaker, with

³¹⁷ Sarah Perez, "Amazon to Control 70 Percent of the Voice-Controlled Speaker Market This Year," *TechCrunch*, May 8 2017, <https://techcrunch.com/2017/05/08/amazon-to-control-70-percent-of-the-voice-controlled-speaker-market-this-year/>.

³¹⁸ David Priest, "Digital Assistants will Outnumber Us All By 2021," *CNET*, May 18 2017, <https://www.cnet.com/news/digital-assistants-to-surpass-global-population-by-2021/>.

the total number of installed speakers eclipsing 175 million.³¹⁹ As voice increasingly becomes a primary mode of interaction between humans and computers, Alexa is poised to continue occupying a central place in these interactions. In tandem with the escalating availability and usage of voice assistants, the industrial gendering of Alexa and other voice assistants ensures interactions with these assistants entail interacting with “her” more so than with “it.”

4.2 Alexa, Voice Assistants, and Gender

Beginning with the 2011 release of Apple’s Siri voice assistant and continuing through the respective releases of Microsoft’s Cortana and Alexa in 2014, the names and vocal intonations of these assistants connote as feminized and imply a personified woman. Beyond mere anecdotal accounts, recent popular discourse demonstrates a penchant for addressing the gendered nature of voice assistants. A 2016 *Atlantic* headline asks “Why Do So Many Digital Assistants Have Feminine Names?” to which the answer is a combination of social norms that associate administrative tasks with women and the likelihood that users find a woman’s voice more trustworthy than a man’s voice.³²⁰ Similarly, other popular press notes the latter interpretation while stressing the former as the most worthy grounds for critique, offering blunt assessments of the corporate secretary as the “real-world analogue for virtual assistants”³²¹ and headlines that declare “It’s So Stupid That Digital Assistants Are Women.”³²²

Media and technology studies scholarship has also recently taken up the question of gender and contemporary voice assistants, with a particular focus on Siri. Citing Siri’s servile, “unthreatening female

³¹⁹ Sarah Perez, “Voice-Enabled Smart Speakers to Reach 55% of U.S. Households by 2022, Says Report,” *TechCrunch*, Nov. 8, 2017, <https://techcrunch.com/2017/11/08/voice-enabled-smart-speakers-to-reach-55-of-u-s-households-by-2022-says-report/>.

³²⁰ Adrienne Lafrance, “Why Do So Many Digital Assistants Have Feminine Names?” *The Atlantic*, Mar. 30, 2016, <https://www.theatlantic.com/technology/archive/2016/03/why-do-so-many-digital-assistants-have-feminine-names/475884/>.

³²¹ Emily Lever, “I Was a Human Siri,” *New York Magazine*, Apr. 26, 2018, <http://nymag.com/selectall/smarthome/i-was-a-human-siri-french-virtual-assistant.html>.

³²² Alex Cranz, “It’s So Stupid that Digital Assistants are Women,” *Gizmodo*, Jan. 4, 2018, <https://gizmodo.com/its-so-stupid-that-digital-assistants-are-women-1821779672>.

presence,” Hilary Bergen notes that “digital women like Siri have certain features...that are designed to placate their user through associations with the nurturing feminine.”³²³ Likewise, as noted by Claude Draude, Siri’s anthropomorphic qualities “present a zone for the contestations of what passes as human and what does not” and, within this zone, “puts gender on the agenda in a very obvious way.”³²⁴ For Thao Phan, Siri’s materiality is of central concern, since automated performance “invokes an anxiety around the displacement of bodies,” and Siri marks a “return of the human body into the domain of the digital” through a material inscription of gender that is “an inherent part of the successful functioning of the interface itself” rather than an application of gendered traits onto a supposedly neutral surface.³²⁵ While Siri’s materially-embodied gender might, for some users, alleviate automation-induced anxieties about the erasure of human bodies, Siri’s gendered embodiment collides with “the politics of a materiality” that corresponds to material circumstances facing human women in lived existence.³²⁶ While these gendered traits and associations also apply to Alexa, the material development and conscious gendering of Alexa by Amazon offers a window into the interplay of production, gender, and material politics.

4.3 Alexa and the Industrial Logics of Gender

Until his retirement in mid-2017, Mike George - Amazon vice president for Alexa, Echo, and the Appstore – referred to Alexa by the feminine pronoun “she,” commonly embedding this gendered conception into promotional intonations around Alexa’s escalating functionality: “she’ll be smarter, able to answer more questions, probably a little more conversational.”³²⁷ Heather Zorn, director of the Alexa

³²³ Bergen, Hilary. “‘I’d Blush if I Could’: Digital Assistants, Disembodied Cyborgs and the Problem of Gender.” *A Journal of Literary Studies and Linguistics* 6 (2016): 100.

³²⁴ Draude, Claude. *Computing Bodies: Gender Codes and Anthropomorphic Design at the Human-computer Interface*. Springer (2017): 17, 15.

³²⁵ Phan, Thao. “The Materiality of the Digital and the Gendered Voice of Siri.” *Transformations (14443775)* 29 (2017): 24; 30; 27.

³²⁶ Ibid 28.

³²⁷ Dan Richman, “The Busiest Amazon ‘Employee’ Ever? Execs Explain Their Plan to Put Alexa Everywhere,” *Geekwire*, Dec. 5, 2016, <https://www.geekwire.com/2016/busiest-amazon-employee-ever-execs-explain-plan-put-alexa-everywhere/>.

engagement team, consciously views and develops Alexa as “‘she’ not ‘it,’” and strives to “keep her gender in mind when considering how customers might interact with her.”³²⁸ Zorn’s team is responsible for devising Alexa’s conversational interactions, functioning as something akin to a television writer’s room in which anticipated questions and potential responses are pitched, debated, revised, and ultimately affirmed. One aspect the team affirmed is Alexa’s own affirmation of feminism when queried on the subject, in addition to affirming support for diversity and social progressiveness.³²⁹ Representations of women, diversity, and social progressiveness are important for Zorn and vicariously important for Alexa, indicating a politics of gender built into Alexa. Despite this cultural politic and the political charge around gender issues during the 2016 presidential election (including the viability of the first female U.S. president), developing Alexa responses around civil presidential politics necessitated a relatively apolitical stance:

“We had a lot of internal debates about this, with a lot of potential paths such as picking a candidate, talking about AIs not having the right to vote, or picking a joke candidate...we decided to do a mixture of truth and humor, with Alexa saying there weren’t any voting booths in the Cloud. We wanted to avoid accidentally reinforcing the idea of her as subservient by pointing out she didn’t have the right to vote — but that she’d vote for her favorite robot BB-8 since she ‘likes the way he rolls.’”³³⁰

In other words, Amazon builds a cultural feminist politics into Alexa while simultaneously demurring against how this feminist disposition might materialize into civic political action. A user receives a straightforward affirmation of Alexa’s feminism, while receiving only a quirky dodge when attempting to ground Alexa’s feminism in participatory politics. For Amazon, however, developing Alexa’s personality

³²⁸ Madeline Buxton, “Writing for Alexa Becomes More Complicated in the #MeToo Era,” *Refinery29*, Dec. 27, 2017, <https://www.refinery29.com/2017/12/184496/amazo-alexa-personality-me-too-era>.

³²⁹ *Ibid.*

³³⁰ *Ibid* [quoted in].

and cultural politics is not merely a technological exercise and, instead, speaks to the importance of Zorn's practice as a means of marketing *who* Alexa is, *what* Alexa does, and, most importantly for the purposes of this chapter, *where* Alexa is most viable as a consumer product.

Since Alexa's public availability in 2015, Amazon has increasingly marketed Alexa as a domestic technology capable of powering not only the Echo home speaker system, but an array of other in-home devices that afford both connectivity among individual devices and the aggregation of these devices into a wholistic home automation system. Where complications around gendered politics are explicitly built into attempts to market Alexa as the driving force of the budding home automation market, this chapter aims to identify the complications of autonomy among intermingled conceptions of technology, gender and domesticity embedded in Amazon's drives to capitalize on the economic potential of home automation. As I will again reinforce, my central claim is that Amazon's marketing of Alexa illuminates a complex series of contrasts in which Alexa's autonomy is alternately conceived as heightened or diminished with respect to distinctions of technology (hardware and software), labor performance (productivity and servility), and social domains (public and private spheres). While it might be tidier to situate autonomy to one particular aegis or another, the material circumstances foisting Alexa into the world and material implications they portend for human women are, in fact, quite complex and necessitate a scholarly undertaking that unpacks this complexity. This is especially important since wholistic notions of home automation among particular streams of scholarship do little to illuminate the complications of gender with respect to marketing digital and voice-assistant technologies for public and/or private usage. By invoking embedded notions of autonomy, my analysis pinpoints a nuanced correspondence between the industrial gendering of home automation and the complexities of cultural ideas about women, emerging technology, and domesticity.

4.4 Home Automation and Technological Distinctions

Among computer science, engineering, and human-computer interaction literatures, discerning among technological facets of home automation is a central occupation. One of the primary streams of these literatures identified and distinguishes overlapping terminology, particularly among “home automation,” “smart homes,” “intelligent homes,” and “connected homes.” In the 2006 collection *Inside the Smart Home*, multiple essays attempt to bracket off terminological applications and corresponding technological distinctions.³³¹ Barlow and Venables note that designations of “‘smart home,’ ‘intelligent homes’ and ‘home automation’ are often used interchangeably” to refer to the potential automation of domestic tasks wherein automation encompasses “simple fixed applications with predefined and pre-established operations, through...programmable applications and devices to...fully flexible and automated applications and networks of devices that share information and provide it to consumers.”³³² Aldrich attempts a more precise rendering of home automation levels, proposing “five hierarchical classes of smart home”: homes that contain intelligent objects; homes that contain intelligence, communicative objects; connected homes (internal and external networking, accessible from within and beyond the home); learning homes (adaptable and flexible to learned patterns of in-home use); attentive homes (anticipates and accommodates the needs of occupants).³³³

Elsewhere, home automation and its related distinctions are analyzed in the context of consumer demand and adoption. Home automation, as the ability to manage and control “disparate systems,” is described a stepping stone to the totalized systematic control of a smart home, with four barriers standing between wider automated home adoption and upscaling towards smart home connectivity: “high

³³¹ Harper, Richard, ed. *Inside the smart home*. Springer Science & Business Media, 2006.

³³² Barlow, James and Tim Venables. “Smart home, Dumb Suppliers? The Future of Smart Homes Markets.” In *Inside the Smart Home*. Springer Science & Business Media (2006): 248 – 249.

³³³ Aldrich, Francis K. “Smart Homes: Past, Present and Future.” In *Inside the Smart Home*. Springer Science & Business Media (2006): 34 – 35.

cost of ownership, inflexibility, poor manageability, and difficulty achieving security.”³³⁴ From a user adoption standpoint, Mennicken et al cite the cultural fear of autonomous technology as a significant barrier to the full potential of home automation, advocating for a vision of “human-home collaboration” to overcome these challenges.³³⁵ While these sectors of scholarship admirably address the complexities of home automation through lenses of technological distinction, consumer viability, and user interaction, the emphasis on home automation as a technological and consumer paradigm leaves unanswered questions about other important distinctions, especially distinctions among intersecting lines of gender, domestic usage and integration, and industrial production. Even as media studies and digital media theory increasingly addresses the connectivity between media industries and empowered citizens in the automated home³³⁶ or the transduction of home space through the increasing proliferation of software-powered objects,³³⁷ questions remain as to the gendered dynamics of home automation that crosscut human-machine lines, especially as gendered technologies such as Alexa proliferate among domestic dwellings. While authors Kember and Zylinska gesture towards the recurrence of “regressive gender ideologies” among visions of technologically-animated “future homes,” and further spotlight autonomy as a countervailing force against such ideologies,³³⁸ my method ultimately seeks to illuminate the way autonomy is already prefigured into Alexa’s technological design, marketing, and integration with other smart objects within the home, an autonomy that corresponds to the gendering of Alexa and implications for women in (and in relation to) the Alexa-driven automated home. I will return to Kember and Zylinska’s

³³⁴Brush, A. J., Bongshin Lee, Ratul Mahajan, Sharad Agarwal, Stefan Saroiu, and Colin Dixon. "Home automation in the wild: challenges and opportunities." In *proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, ACM (2011): 2115; 2123.

³³⁵ Mennicken, Sarah, Jo Vermeulen, and Elaine M. Huang. "From today's augmented houses to tomorrow's smart homes: new directions for home automation research." In *Proceedings of the 2014 ACM International Joint Conference on Pervasive and Ubiquitous Computing*, ACM (2014): pp. 111-112.

³³⁶ Tussey, Ethan. *The Procrastination Economy: The Big Business of Downtime*. NYU Press, 2018.

³³⁷ Kitchin, Rob, and Martin Dodge. *Code/space: Software and everyday life*. Mit Press, 2011.

³³⁸ Kember, Sarah, and Joanna Zylinska. *Life after new media: Mediation as a vital process*. MIT Press (2012): 102 – 107.

ideas about autonomy and intelligent homes later in my analysis. First, it is necessary to unpack the various threads among media studies and technology studies that address relationships among technology, gender, and domesticity, and thereby crystallize the specific nature of my intervention as it both pulls from and contributes to recurring questions among emergent media and technological paradigms.

4.5 Technology, Gender, and Domesticity

A critical touchstone for inquiries into the relationship between gender and technology is Donna Haraway's "cyborg manifesto," a call for a non-normative, porous concept of feminism and gendered identity conceptualized through the lens of the cyborg as an assemblage of biological and machine components resistive of normative identity and patriarchal power constructs.³³⁹ Haraway's cyborgian concept has been widely cited and complicated among media studies and technology studies,³⁴⁰ in addition to its influence (direct and indirect) on feminist approaches to emerging media and technology. Standouts in this field include the considerable work of Judy Wajcman³⁴¹ and Cynthia Cockburn.³⁴² Wajcman's landmark work *Feminism Confronts Technology* (1991) is a social shaping approach to scrutinizing relationship of technology and gender. Her chapter on domestic technology leverages social shaping to push

³³⁹ Haraway, Donna Jeanne. *A manifesto for cyborgs: Science, technology, and socialist feminism in the 1980s*. San Francisco, CA: Center for Social Research and Education, 1985.

³⁴⁰ See: Gray, Chris Hables, Heidi J. Figueroa-Sarriera, and Steven Mentor. *The cyborg handbook*. Routledge, 1995; Balsamo, Anne Marie. *Technologies of the gendered body: Reading cyborg women*. Duke University Press, 1996; Kirkup, Gill, ed. *The gendered cyborg: A reader*. Psychology Press, 2000; Gray, Chris Hables. *Cyborg citizen: Politics in the posthuman age*. Routledge, 2000; Sundén, Jenny. "What happened to difference in cyberspace? The (re) turn of the she-cyborg." *Feminist Media Studies* 1, no. 2 (2001): 215-232; Puar, Jasbir K. "'I would rather be a cyborg than a goddess': Becoming-Intersectional in Assemblage Theory." *PhiloSOPHIA* 2, no. 1 (2012): 49-66; Johnson, Robin S. "Temp Cyborgs: Gender, Technology, and Immaterial Labor in Popular Science Fiction Television." *Television & New Media* 14, no. 2 (2013): 106-123; Zylinska, Joanna, ed. *The cyborg experiments: The extensions of the body in the media age*. A&C Black, 2002.

³⁴¹ Wajcman, J. 1991. *Feminism Confronts Technology*, Cambridge, Polity Press; Wajcman, Judy. "Reflections on gender and technology studies: in what state is the art?." *Social studies of science* 30, no. 3 (2000): 447-464; Wajcman, J. 2004. *TechnoFeminism*, Cambridge, Polity Press.

³⁴² Cockburn, C. 1983. *Brothers: Male Dominance and Technological Change*, London, Pluto Press; Cockburn, C. 1985. *Machinery of Dominance: Women, Men and Technical Know-How*, London, Pluto Press; Cockburn, C. and Ormrod, S. 1993. *Gender and Technology in the Making*, London, Sage.

back against technological determinisms that cast innovation as the primary agents of change between an “informal household economy and the formal economy,” urging instead considerations of the way “gendered meanings are encoded in the design process.”³⁴³ Likewise, writing in 1992 on domestic technologies and gender, Cockburn’s claim that the “social relations of technology are gendered relations”³⁴⁴ attempts to evoke a proposition that (according to Cockburn) had not yet become widely accepted at the time, stressing the incomplete nature of technological analyses that sidestep gender, notably with regard to the home sphere. Wendy Faulkner pulls from these concerns when advocating for “feminist technology studies” as a “nuanced and politically helpful framework for analyzing the relationship between technology and gender.”³⁴⁵ She deepens an understanding of the way gendered relations are built into technological design by outlining seven ways technology is gendered: designers are “*predominantly men*”; “*gender division of labor around technology*”; the material and symbolic gendering of artifacts; “*hegemonic masculinity*” is the primary cultural association with technology; knowledge and practice is gendered; work styles are gendered; and technology as key in the construction and maintenance of male identity.³⁴⁶

With the emergence of the digital turn, feminist and gender approaches to technology increasingly turned towards informational and computational technologies, often with considerations of – and implications for – the domestic sphere. As computational “new” media increasingly became a predominant area of inquiry, historiographical approaches attempted to situate “old” media within intertwined social contexts for domestic integration and gender roles. In her milestone work *When Old Technologies Were New: Thinking About Electric Communication in the Late Nineteenth Century* (1990), Carolyn Marvin’s

³⁴³ Wajcman, *Feminism Confronts Technology*, 82, 106.

³⁴⁴ Cockburn, Cynthia. “The circuit of technology: gender, identity and power.” *Consuming technologies: Media and information in domestic spaces* (1992): 29.

³⁴⁵ Faulkner, Wendy. “The technology question in feminism: A view from feminist technology studies.” In *Women’s studies international forum*, vol. 24, no. 1, Pergamon (2001): 79.

³⁴⁶ *Ibid* 89-90.

assesses the ways telephony and other electronic communication devices integrated into the home and both upturned and reinforced social expectations for women within and exterior to the domestic sphere.³⁴⁷ More recently, Lisa Gitelman demonstrates the way forms of recorded sound were defined by middle-class women who facilitated the integration, accessibility, and intelligibility of recorded sound in domestic homes.³⁴⁸ Similarly, William Boddy stresses early 20th century social conceptions of gender and domestic roles as influencing the widespread uptake of radios in the home and gendered associations with its development, evolution, and usage.³⁴⁹ In tandem with these historical approaches, cyberfeminism emerged in the 1990s as a framework addressing the complications of gender and political power in virtual spaces and processes, interrogating both new problems and the reification of lived gender dynamics posed by computational logics.³⁵⁰ Within analyses of new media, scholars have addressed the role of automation among digital and virtual life.

4.6 Automation and Gender

Judith Halberstam³⁵¹ describes gender as an “automated construct” owing to the alignment of gender and computer intelligence as “learned, imitative behavior that can be processed so well that it

³⁴⁷ Marvin, Carolyn. *When old technologies were new: Thinking about electric communication in the late nineteenth century*. Oxford University Press, USA (1990): 63 – 108.

³⁴⁸ Lisa Gitelman, *Always Already New. Media, History, and the Data of Culture* (MIT Press, 2006).

³⁴⁹ Boddy, William. *New media and popular imagination: Launching radio, television, and digital media in the United States*. Oxford University Press on Demand, 2004.

³⁵⁰ See: Braidotti, Rosi. "Cyberfeminism with a difference." *Futures of critical theory: Dreams of difference* (1996): 239-259; Daniels, Jessie. "Rethinking cyberfeminism (s): Race, gender, and embodiment." *WSQ: Women's Studies Quarterly* 37, no. 1 (2009): 101-124; Kember, Sarah. *Cyberfeminism and artificial life*. Routledge, 2003; Hawthorne, Susan, and Renate Klein, eds. *Cyberfeminism: Connectivity, critique and creativity*. Spinifex Press, 1999; Minahan, Stella, and Julie Wolfram Cox. "Stitch'nBitch: Cyberfeminism, a third place and the new materiality." *Journal of material culture* 12, no. 1 (2007): 5-21.

³⁵¹ Halberstam transitioned to “Jack,” but accepts both “Jack” and “Judith,” as well as masculine and feminine pronouns. In this instance, I use “Judith” in accordance with Jack’s name at the time of cited work, the indexical attribution of this work, and most importantly, Jack’s own acceptance of “Judith.” For more information, see: Jack Halberstam, “On Pronouns,” Sep. 3, 2012, <http://www.jackhalberstam.com/on-pronouns/>.

comes to look natural."³⁵² While a particularly vibrant stream of technology studies considered the relationship between automation and women's office work in the 1980s,³⁵³ feminist considerations of automated technologies and performance populate strands of scholarship addressing digitality and the domestic sphere. Channeling Halberstam's constructivism, AJ Berg describes the automated smart home as a "gendered socio-technical construct" built by men who fail to understand or imagine how smart home design impedes upon and intensifies the social expectations of women's work in the home.³⁵⁴ In this vein, recent scholarship allegorizes the relationship between automated robots and women in the domestic sphere. Where Alison Adam accounts for the gender biases inscribed in real-world artificial intelligence,³⁵⁵ Julie Wosk focuses on cultural representations of feminized machines, including robots and "artificial eves,"³⁵⁶ as does Despina Kakoudaki's cultural analysis of artificial women that "dominate the technological and representational landscape at the turn of the [21st] century,"³⁵⁷ as well as Heather Hicks' turn-of-the-century analysis of Joanna Russ' novel *The Female Man* (1975) as a read against inter-

³⁵² Halberstam, Judith. "Automating gender: Postmodern feminism in the age of the intelligent machine." *Feminist Studies* 17, no. 3 (1991): 457; 443.

³⁵³ See: Webster, Juliet. *Office Automation: The Labour Process and Women's Work in Britain*. Harvester Wheatsheaf, 1990; Baran, Barbara. "Office automation and women's work: The technological transformation of the insurance industry." *High technology, space, and society* (1985): 143-171; Chalude, Monique, and Marcel Bolle De Bal. *Office automation and work for women*. Commission of the European Communities, 1984; Cornfield, Daniel B., Polly A. Phipps, Diane P. Bates, Deborah K. Carter, Trudie W. Coker, Kathleen E. Kitzmiller, and Peter B. Wood. "Office automation, clerical workers, and labor relations in the insurance industry." In *Workers, managers, and technological change*, pp. 111-134. Springer, Boston, MA, 1987; Coates, Vary T. "Office automation: Productivity, employment and social impacts." *Office Technology and People* 4, no. 3 (1988): 315-326.

³⁵⁴ Berg, AJ (1994) A gendered socio-technical construction: the smart house. In: Cockburn, C, Furst Dilic, R (eds) *Bringing Technology Home: Gender and Technology in Changing Europe*. Buckingham: Open University Press, pp. 165–180.

³⁵⁵ Adam, Alison. *Artificial knowing: Gender and the thinking machine*. Routledge, 2006.

³⁵⁶ Wosk, Julie. *Women and the machine: representations from the spinning wheel to the electronic age*. JHU Press, 2003; Wosk, Julie. *My Fair Ladies: Female Robots, Androids, and Other Artificial Eves*. Rutgers University Press, 2015.

³⁵⁷ Kakoudaki, Despina. *Anatomy of a robot: Literature, cinema, and the cultural work of artificial people*. Rutgers University Press (2014): 109.

linked notions of cyborgian female labor and automation's alleged potential to render formal labor obsolete.³⁵⁸ Around this time, Sadie Plant also linked automation to the "feminization of the workforce," arguing for social anxieties around automation as more prominent among men fearful of losing their masculinity and laboring dominance to the increasing sweep of "feminized" automation.³⁵⁹ More recently, media studies scholarship quickly seized upon the films *Her* (2013) and *Ex Machina* (2015) as fruitful texts for analyzing gendered aspects of human-machine romance³⁶⁰ and robotic embodiment,³⁶¹ including the way female robots stand in for "automated anxiety."³⁶² Leopoldina Fortunati, on the other hand, describes a more amenable disposition towards domestic automation, as the "robotization of the domestic sphere" is enabled by automated "proto-robotization" of broader social and technological phenomena that include computer-mediated communication between humans; online information processing (i.e. algorithmic generation); social behaviors; robotization of the human body; and robotization of everyday machines.³⁶³

³⁵⁸ Hicks, Heather J. "Automating Feminism: The Case of Joanna Russ's *The Female Man*." *Postmodern Culture* 9, no. 3 (1999).

³⁵⁹ Plant, Sadie. *Zeroes + Ones: Digital Women + the New Technoculture*. New York: Doubleday (1997): 39.

³⁶⁰ Jollimore, Troy. "'This Endless Space between the Words': The Limits of Love in Spike Jonze's *Her*." *Midwest Studies In Philosophy* 39, no. 1 (2015): 120-143; Flisfeder, Matthew, and Clint Burnham. "Love and Sex in the Age of Capitalist Realism: On Spike Jonze's *Her*." *Cinema Journal* 57, no. 1 (2017): 25-45; McBride, William Thomas. "'She's not There'—Shallow Focus on Privacy, Surveillance, and Emerging Techno-Mediated Modes of Being in Spike Jonze's *Her*." In *Spaces of Surveillance*, pp. 65-85. Palgrave Macmillan, Cham, 2017; Webb, Lawrence. "When Harry met Siri: digital romcom and the global city in Spike Jonze's 'Her'." *Global Cinematic Cities: New Landscapes of Film and Media* (2016): 95; Gaines, Elliot I. "Reflections on the Semiotics of Relationships and Love in the Movie 'Her'." *Semiotics* (2015): 99-106.

³⁶¹ Hasse, Cathrine. "The Vitruvian robot." *AI & Society* (2017): 1-3; Flynn, Susan. "Ex Machina: Possessing and Re-possessing the Body." *Ethos: A Digital Review of the Arts, Humanities and Public Ethics* 3, no. 1 (2017): 32-45; Henke, Jennifer. "'Ava's body is a good one': (Dis) Embodiment in Ex Machina." *American, British and Canadian Studies* 29, no. 1 (2017): 126-146; Virginás, Andrea. "Gendered transmediation of the digital from S1m0ne to Ex Machina: 'visual pleasure' reloaded?" *European Journal of English Studies* 21, no. 3 (2017): 288-303.

³⁶² Glick, Julia. "Today I'm Going to Test You: Oppositional Cyborgs and Automated Anxiety in Ex Machina." *Film Matters* 8, no. 3 (2017): 36-41

³⁶³ Fortunati, Leopoldina. "Robotization and the domestic sphere." *New Media & Society* (2017), 1461444817729366: p. 11-13.

Along similar lines, Kylie Jarrett's "digital housewife" draws from a Marxist conception of automation as the expropriation and alienation of human labor transferred to machines and, through this lens, charts a correspondence between women's unpaid domestic labor and the social production of economic value by online consumers.³⁶⁴ In 2015, the same year as Jarrett's monograph on the digital housewife and the inaugural issue of the journal *Catalyst: Feminism, Theory, Technoscience*, the feminist collective Laboria Cuboniks published the manifesto "Xenofeminism: A Politics for Alienation," urging a "feminist futurity" predicated on a vision of "augmented homes...communal media and technical facilities" as a transformative conception of domestic life concomitantly transformative of women's political power.³⁶⁵ Helen Hester's recent monograph *Xenofeminism* (2018) describes this brand of feminism as a "technomaterialist, anti-naturalist, and gender abolitionist" feminism in which domestic automation can serve as a "point of leverage in efforts to transform oppressive socio-biological conditions."³⁶⁶ In arguing for autonomy as the most viable lens for understanding the complications of home automation, the gendering of Alexa, and its implications for lived domesticity, my pivot towards autonomy draws from many of these preceding works, in addition to television studies and the work of Lynn Spigel, whose research informs both my topical and methodological inquiry.

4.7 Television Studies and Lynn Spigel: Towards a Methodological Approach

Concerns for contexts of reception, spectatorship, and usage have led many television scholars to explore interrelations among gender, identity, television (and related technologies), and the home, as well as the role of industry towards influencing and refining these interrelations. The work of the late David Morley, for example, grants considerable insights into the nature of television within the domestic

³⁶⁴ Jarrett, Kylie. *Feminism, labour and digital media: The digital housewife*. Vol. 33. Routledge, 2015.

³⁶⁵ Laboria Cuboniks. "Xenofeminism: A Politics for Alienation." http://www.laboriacuboniks.net/20150612-xf_layout_web.pdf.

³⁶⁶ Hester, Helen. *Xenofeminism*. John Wiley & Sons (2018): 6-7 [italics in original].

sphere, particularly with regard to the use and interpretation by different types of domestic families,³⁶⁷ a “gendered framework” of family viewing,³⁶⁸ gendered associations among local and global contexts,³⁶⁹ and the mediation of the home itself through increasing digital connectivity.³⁷⁰ Likewise, Roger Silverstone’s work on television and information technologies in the home includes considerations of gender, technological design, and domestic usage.³⁷¹ Increasingly, scholars foreground (post)feminist theory as a necessary critical approach to television texts, sites of reception, and production.³⁷² While Lynn Spigel researches prolifically in the area of her television studies, her larger body of work cuts across media technologies, texts, and domestic paradigms to consider the way industrial and cultural imaginaries mitigate the dynamics of gender in technologically-enlivened households. Notably, *Make Room For Television* (1992) and *Welcome to the Dreamhouse* (2001) respectively historicize the vast proliferation of television sets into American homes and mediated socio-techno visions of real and imagined suburban households during the postwar era. In 2012, Spigel received a Guggenheim fellowship for her work on smart homes and the digitization of everyday domestic life, work that thus far includes essays on smart

³⁶⁷ Morley, David. *Family Television: Cultural Power and Domestic Leisure*. Routledge, 1986.

³⁶⁸ Morley, David. *Television, audiences and cultural studies*. Routledge, 1992.

³⁶⁹ Morley, David. *Home territories: Media, mobility and identity*. Routledge, 2002.

³⁷⁰ Morley, David. "Domesticating dislocation in a world of 'new' technology." *Electronic Elsewheres: Media, technology, and the experience of social space* (2010): 3-15.

³⁷¹ See: Silverstone, Roger. *Television and everyday life*. Routledge, 2003; Hirsch, Eric, and Roger Silverstone, eds. *Consuming technologies: Media and information in domestic spaces*. Routledge, 2003; Silverstone, Roger, Eric Hirsch, and David Morley. "Listening to a long conversation: An ethnographic approach to the study of information and communication technologies in the home." *Cultural Studies* 5, no. 2 (1991): 204-227; Silverstone, R. and Haddon, L. (1996) 'Design and the Domestication of Information and Communication Technologies: Technical Change and Everyday Life', in Silverstone, R. and Mansell, R (eds) *Communication by Design: The Politics of Information and Communication Technologies*, Oxford University Press, Oxford, pp. 44-74.

³⁷² See: Haralovich, Mary Beth, and Lauren Rabinovitz, eds. *Television, history, and American culture: feminist critical essays*. Duke University Press, 1999; Brunson, Charlotte, and Lynn Spigel. *Feminist television criticism: A reader*. McGraw-Hill Education (UK), 2007; Lotz, Amanda D. "Postfeminist television criticism: Rehabilitating critical terms and identifying postfeminist attributes." *Feminist Media Studies* 1, no. 1 (2001): 105-12; Johnson, Merri Lisa, ed. *Third wave feminism and television: Jane puts it in a box*. IB Tauris, 2007; Moseley, Rachel, Helen Wheatley, and Helen Wood, eds. *Television for Women: New Directions*. Taylor & Francis, 2016.

home design and production.³⁷³ My interest in Spigel's work speaks not only to the considerable insights gleaned from her specific analyses of smart homes and technology, domesticity, and gender more generally, but, more importantly for the purposes of this essay, her method for generating claims about the cultural inception and significance of these paradigms. I'm particularly interested in her analyses of advertising, promotional, and marketing materials (among other texts) as inroads into industrial imaginaries that shape the development and uses of domestic-bound technologies.

Across her considerable outputs, Spigel examines a wide range of industrial texts and artifacts, including advertisements, consumer guides, popular magazine articles, promotional materials, and pop culture texts (film, television). Her approach understands these types of texts as forming an "intertextual network...through which people encounter statements about and images of the social world."³⁷⁴ My approach builds off this conception to stress the role of marketing undergirding industrial statements and images about the social world, a role that infuses industrial texts aimed directly at consumers - advertising, consumer guides, popular articles, and pop culture - as well as texts and venues aimed at marketing products and services to other businesses and third-party collaborators. Where Spigel reads industrial texts to unearth domestic-related dispositions and inclinations common among industry and everyday social dwellers in a preceding historical period, my approach is more explicit to the contemporaneous culture and economic drives of Amazon as it endeavors to seize a prominent place within the nascent home automation market by marketing Alexa as a consumer product enabling smart connectivity for consumers and industrial connectivity among third-party software and appliance producers. Analyzing Amazon's marketing of Alexa moves beyond home automation as mere technological and consumeristic

³⁷³ See: Spigel, Lynn. "Designing the smart house: Posthuman domesticity and conspicuous production." *European Journal of Cultural Studies* 8, no. 4 (2005): 403-426; Spigel, Lynn. "Object lessons for the media home: From storage wall to invisible design." *Public Culture* 24, no. 3 68 (2012): 535-576; Spigel, Lynn. "Back to the drawing board: graphic design and the visual environment of television at midcentury." *Cinema Journal* 55, no. 4 (2016): 28-54.

³⁷⁴ Spigel, *Welcome to the Dreamhouse*, 15.

paradigms and instead evokes embedded notions of autonomy that correspond to gendered implications for life within – and in relation to – the Alexa-driven automated home. By transcending automation, my analysis conceptualizes a human-machine autonomy that stresses the implications for human autonomy and, more precisely, further illuminates the ways industrial automation paradigms differentiate human autonomous potential with respect to gender.

4.8 Alexa: Marketing Autonomy in Home Automation

I argue that Amazon's marketing of Alexa reveals alternating intensities of autonomy wherein Alexa is conceived as highly and minimally autonomous within the automated home (and in relation to home automation devices) with respect to contrasting dispositions towards software and hardware, productivity and servility, and public and private spheres. Amazon's marketing allegorizes implications for human women, as the female gendering of Alexa corresponds to cultural conceptions both dogging and enabling women across the historical and contemporary emergence of domestic technologies. To be clear, I do not wish to suggest that Amazon intends to diminish the autonomy of human women or otherwise explicitly market its wares in conjunction with patriarchal norms. Instead, Amazon's gendering of Alexa and the company's desire to fortify Alexa as the home automation device *par excellence* emerges from cultural and economic logics that have lingered in structural arrangements for domestic life, work, and marketplace aptitude over long periods of time. In this way, the marketing of Alexa not only illuminates many of these complexities but also shines a light on how the contemporaneous circumstances of Alexa's cultural and marketplace rollout collides and repels with preceding technology developed with an eye towards domestic integration and usage.

I focus on marketing because of its centrality to corporate modes of production, dissemination, and consumer reception, as well as the industrial insights built into these modalities and the goods they support. In contemporaneous society, marketing is the “center of soul of the corporation,”³⁷⁵ since marketing is often the driving force behind *what* gets developed, for *whom* it is intended, *where* its consumption is most viable, and *how* it incepts into existing paradigms. Media studies scholars increasingly foreground marketing for its key role in eliciting and facilitating the manifestation of media from conceptual design to aftermarket analysis. Justin Wyatt’s *High Concept* (1994) traces the film’s industry’s increasing reliance on a marketing approach that entails using short pitches, pre-existing identities, and pictorial iconography to sell studio executives on film investment and subsequently sell movie audiences on the allure of the finished film.³⁷⁶ Alongside other recent works addressing the role of film marketing,³⁷⁷ Charles Acland describes the “era of the permanent *marketing* campaign”³⁷⁸ as a driving force behind the perpetual selling of film texts and concomitant selling of consumeristic venues for film texts as the film industry attempts to expand the life cycle of film monetization. Outside of the film industry, marketing is identified one of three “circuits of interactivity” (alongside technological and cultural circuits) co-constituted as “synergistic relations constructed within a cybernetic system of production and consumption”³⁷⁹ within the video game industry’s approach to corporate financing of game development. For the computer industry, Jonathan Sterne locates the importance of marketing as a source of expeditious innovative churn that refreshes markets for computer sales through planned obsolescence of computer

³⁷⁵ Deleuze, Gilles. "Postscript on the Societies of Control." *October* 59 (1992): 5.

³⁷⁶ Wyatt, Justin. *High concept: Movies and marketing in Hollywood*. University of Texas Press, 1994.

³⁷⁷ See: Kerrigan, Finola. *Film Marketing*. Routledge, 2017; Thompson, Kristin. *The Frodo franchise: the Lord of the rings and modern Hollywood*. Univ of California Press, 2007; Perren, Alisa. *Indie, Inc.: Miramax and the Transformation of Hollywood in the 1990s*. University of Texas Press, 2012.

³⁷⁸ Acland, Charles R. *Screen traffic: Movies, multiplexes, and global culture*. Duke University Press (2003): 77.

³⁷⁹ Kline, Stephen, Nick Dyer-Witheford, and Greig De Peuter. *Digital play: The interaction of technology, culture, and marketing*. McGill-Queen's Press-MQUP (2003): 59.

capabilities.³⁸⁰ For all media industries, marketing entails a wide range of functions stretching across industrial texts, practices, and interactions. One of the most fruitful sources for gleaming marketing insights is an industrial trade show.

As noted by media industries scholar John Caldwell, trade shows function as “contact zones” where companies and their representatives foster notions of industrial harmony and shared identity.³⁸¹ Trade shows are opportunities for companies to market their products, services, corporate identity, and marketplace aspirations to other companies and industrial actors, often in the hopes of (per Caldwell’s sentiment) brokering collaborations to capitalize on untapped consumer potential and achieve shared goals. Given that the “A” in Bezos’ MARS event acronym stands for “home automation,” it’s a clear indication of the importance of the home automation market for Bezos’ company and the importance of marketing Amazon’s prestige to other technological and cultural elites, even if MARS is more of an opportunity for bawdy showmanship than sober industrial brinkmanship. Elsewhere, however, Amazon takes full advantage of opportunities to market Alexa to would-be collaborators and wider technological publics. For Amazon, as well as other tech companies, the Consumer Electronics show is the premier trade show for marketing products, services, and collaborative opportunities. In the case of Alexa, CES serves as a vehicle for promoting Alexa’s capabilities for home automation and, more critically, marketing collaborations between Amazon and domestic device makers that enable Alexa to power other individual devices and the aggregation of such devices into a wholistic home automation system.

4.9 Methodological Approach to Marketing Discourse

My analysis of Amazon’s Alexa marketing begins with a 2017 CES demonstration facilitated by Amazon’s Alexa vice president Mike George and LG Electronics vice president David Vanderwaal, both of

³⁸⁰ Sterne, Jonathan. "Out with the trash: On the future of new media." In Ed. Charles Acland *Residual media* (2007): 16-31.

³⁸¹ Caldwell, John Thornton. *Production culture: Industrial reflexivity and critical practice in film and television*. Duke University Press (2008): 70.

whom showcase an LG smart refrigerator with integrated Alexa functionality. As noted by Acland, CES is more than just a venue to promote technological wares, as it serves as a critical juncture to “strike alignments between technological and content,”³⁸² or, similarly, for Amazon to market its existing collaborative outcomes as a means of inducing subsequent third-party actors to interoperate with Alexa. Interoperate, in this sense, entails both corporate partnerships (such as that between Amazon and LG) and informal collaborations with third-party developers enhancing Alexa’s technological capabilities through Alexa Skills Kit (ASK), a series of open application programming interfaces (APIs) enabling developers to build and publish enhanced Alexa functionalities. Beginning in mid-2015, Amazon marketed ASK to developers as a way to enlarge Alexa’s range of capabilities while simultaneously enabling third-party developers and companies to tout Alexa’s integration with associated products and services. Subsequent to the availability of ASK, CES events have featured an increasing array of Alexa-powered home automation products, even when Amazon does not have an official presence at the show. Thus, I begin with the presentation between George and Vanderwaal for what it epitomizes as a means of marketing Alexa to corporate and wider publics with a shared stake or interest in the home automation market. More pertinently, however, just as this presentation epitomizes Alexa’s interlinkage with other domestic technologies, it also enables a pathway into interlinked marketing discourse across CES, trade press coverage, Amazon press releases, and guides for both consumers and developers.

From a methodological standpoint, my approach understands trade press coverage of the 2017 demonstration by George and Vanderwall as a significant “nodal point” among Amazon’s attempts to market Alexa to third-party collaborators and consumers. A nodal point, as described by Laclau and Moueffe, is a privileged site among a broader network of discursive formations.³⁸³ Although I begin with

³⁸² Charles Acland "Consumer Electronics and the Building of an Entertainment Infrastructure" in Lisa Parks and Nicole Starosielski eds. *Signal Traffic: Critical Studies of Media Infrastructures* (2015): 262.

³⁸³ Ernesto Laclau, and Chantal Mouffe, *Hegemony and Socialist strategy: Towards a Radical Democratic Politics*, (Verso Books, 1985): 112.

trade press coverage of the LG-Alexa refrigerator, I'm interested in both this coverage itself and its viability as an entry point into other significant nodes within the wider network of Amazon's Alexa marketing. Thus, my approach to illuminating the complexities of autonomy embedded in Amazon's marketing is the most worthwhile approach for understanding marketing as profuse among industrial text, practices, and collaborative machinations and how gendered conceptions of autonomy germinates Amazon's desire to achieve supremacy in the home automation marketplace. In this way, my methodology also incorporates aspects of Spigel's "intertextual network." Through this approach, I will demonstrate how Amazon's marketing of Alexa reveals gendered notions of autonomy affording different autonomous potential for Alexa and, allegorically, human women with respect to the automated home and notions of social power, domestic roles, technological usage, and mobility within and beyond domestic borders.

4.10 CES: Someone's in the Kitchen with Alexa

The 2017 CES demonstration by Vanderwall and George transpired as one segment among a longer presentation of LG's Smart InstaView, a smart refrigerator that includes a touchscreen interface with software applications for virtually viewing the refrigerator's contents, accessing recipes, and enabling connectivity to other web services. LG's presentation begins with a video of a woman interacting with the touchscreen interface. After viewing a recipe, the woman says aloud "Alexa, I would like to buy sparkling water and celery."³⁸⁴ Those acquainted with Alexa's conversational interactivity might then expect to hear Alexa acknowledge the request and affirm the order has been placed. Instead, in this instance, the video cuts to an Amazon icon with adjacent text indicating "order placed" on the touchscreen. When George joins Vanderwaal on stage, Alexa's voice is likewise never heard, as the two spend the duration of their shared time on stage reiterating consumeristic possibilities depicted in the

³⁸⁴ Adi Robertson, "LG put webOS and Amazon Alexa on a Fridge," The Verge, Jan 4, 2017. <https://www.theverge.com/ces/2017/1/4/14166240/lg-webos-amazon-alexa-fridge-announce-ces-2017>.

video and regurgitating corporate boilerplate, with Vanderwall declaring: “life is going to be easier, simple and, dare I say, more fun in the kitchen.”³⁸⁵ Amidst a mild fascination with the Alexa-powered LG refrigerator among popular and trade press, expert commentators noted “voice is definitely going to be widely used....however, when I look at a fridge that you can talk to, that seems like a bit of a gimmick at this point.”³⁸⁶ Shortly thereafter, the HBO television series *Silicon Valley* lampooned the “gimmicky” nature of this device when computer engineer and stoic Satanist Gilfoyle decried his roommates’ new voice-enabled smart fridge as “solutionism at its worst,”³⁸⁷ citing Evgeny Morozov’s term “technological solutionism” and its denouncement of the tech industry’s tendency to offer technological solutions to problems that either require greater complexity to solve or otherwise only exist among corporate ideologies for market expansion.³⁸⁸ Even if the integration of Alexa into a smart fridge might elicit notions of frivolity from some commentators, Lynn Spigel’s work on the integration of television into a stove implores an understanding of the ways corporate ideologies integrate notions of gender and domestic roles when developing and marketing emerging technologies.

Writing on the development of the “TV-stove” – a kitchen stove with integrated television screen and reception – Spigel notes that “its invention should remind us of the concrete social, economic, and ideological conditions that made this contraption possible,”³⁸⁹ even if such inventions are part of solutionist tendencies or otherwise viewed as frivolous novelties. The TV-stove’s emergence was made possible by the “conflation of labor and leisure time at home”³⁹⁰ in conjunction with social conceptions of work performed in private and public spheres and who performs such work. For the makers of the TV-

³⁸⁵ “LG Refrigerator with Alexa Assistant | CES 2017,” IGadgetPro, Jan. 5, 2017, <https://www.youtube.com/watch?v=dY67JxSO2V4&t=59s>.

³⁸⁶ “CES 2017: LG Fridge is Powered by Amazon’s Alexa,” BBC, Jan. 4, 2017. <http://www.bbc.com/news/technology-38509167>.

³⁸⁷ Jamie Babbit, “The Patent Troll,” *Silicon Valley*, New York City, NY: HBO, 2017.

³⁸⁸ Morozov, Evgeny. *To save everything, click here: The folly of technological solutionism*. Public Affairs, 2013.

³⁸⁹ Spigel, *Make Room for TV*, 73.

³⁹⁰ *Ibid* 73.

stove, its development was economically viable due to contemporaneous notions of the home as the naturalized purview of women's labor and the inevitability that such labor would entail opportunities for leisured spectatorship beneficial to television advertisers. Given the inexorability of the domestic sphere as the exclusive space for a stove with a television screen, the emergence of a refrigerator with a touchscreen for intra-fridge and internet perusal suggests a persistence of similar social and economic logics, even amidst some degree of progressive social transformations. While the integration of Alexa into a smart refrigerator could be understood as technological experimentation or (in the spirit of MARS) an opportunity for promotional spectacle, a wider analysis of Alexa's presence at CES and Amazon's marketing efforts brings to light the social, economic, and ideological conditions tying together notions of autonomy underlying Amazon's gendering of Alexa and the company's quest for home automation supremacy.

Beyond Alexa's presence in the LG smart fridge, Alexa was omnipresent at CES 2017, as Alexa-enabled products proliferated widely among floor exhibits and demonstrations, including showerheads, security systems, home environmental monitoring systems, sleep-aid systems, dimmer switches, lamps, power strips, and non-Amazon speaker systems.³⁹¹ The prolificacy of Alexa at CES 2017 hardly went unnoticed, as trade and popular press headlines trumpeted Alexa's widespread presence:

"Alexa Just Conquered CES. The World is Next."³⁹²

"I Have Seen the Future. Alexa Controls Everything."³⁹³

"CES 2017: Amazon's Virtual Aide Alexa Shouts Above Rivals."³⁹⁴

³⁹¹ Ry Christ, "Here are all of the new Alexa devices and skills of CES," CNET, Jan. 7, 2017, <https://www.cnet.com/news/whats-alex-a-up-to-at-ces-heres-a-running-list-ces-2017/>.

³⁹² David Pierce, "Alexa Just Conquered CES. The World is Next," *Wired*, Jan. 6, 2017, <https://www.wired.com/2017/01/ces-alex-a-in-everything/>.

³⁹³ Mark Walton, "I Have Seen the Future. Alexa Controls Everything," *Ars Technica*, Jan. 9, 2017, <https://arstechnica.com/gadgets/2017/01/ces-2017-alex-a-ai-oled/>.

³⁹⁴ Chris Baraniuk, "CES 2017: Amazon's Virtual Aide Alexa Shouts Above Rivals," *BBC News*, Jan. 7, 2017, <http://www.bbc.com/news/technology-38539326>.

In many ways, Alexa’s dominance of CES 2017 is an extension of CES 2016, as trade press coverage of the first CES after Alexa’s June 2015 debut noted the explicit attempts by Amazon to position Alexa as the driver of home automation:

“Amazon’s Stealth Takeover of the Smart Home at CES 2016.”³⁹⁵

“Amazon’s Alexa and Dash Services Would Like to Control Your Home.”³⁹⁶

“Alexa, When Will You Work Well Outside the Home?”³⁹⁷

As suggested by these headlines, by the end of CES 2016 trade press had already taken note of Amazon’s home automation ambitions for Alexa. Among these 2016 and 2017 CES writeups, trade press headlines that declare “Amazon’s Alexa is everywhere at CES 2017”³⁹⁸ collapse two aspects of Alexa pro-lificity— first, Alexa is widely visible and discussed among demonstrations, exhibits, and branding; and, second, Alexa is widely integrated into a vast spectrum of hardware devices. Alexa is a singular software embedded into a plurality of devices showcased at CES, meaning that Alexa is both marketed *everywhere* at CES and marketed as *everyware*, a type of ubiquitous computing that “permeates places and pursuits” and presents to users as a naturalized manifestation of computational possibilities in everyday devices not commonly associated with computers.³⁹⁹ Whether marketed as the software powering voice interactivity with the LG fridge, Amazon’s own Echo, or myriad other domestic devices, marketing Alexa as ubiquitously interoperable illuminates complications of autonomy stemming from gendered associations with software, hardware, and political power.

³⁹⁵ Nick Statt, “Amazon’s Stealth Takeover of the Smart Home at CES 2016,” *The Verge*, Jan. 7, 2016, <https://www.theverge.com/2016/1/7/10719202/amazon-alexa-ces-2016-takeover-smart-home>.

³⁹⁶ Glenn Derene, “Amazon’s Alexa and Dash Services Would Like to Control Your Home,” *Consumer Reports*, Jan. 7, 2016, <https://www.consumerreports.org/ces-2016/amazon-alexa-and-dash-services-would-like-to-control-your-home/>.

³⁹⁷ Lauren Goode, “Alexa, When Will You Work Well Outside the Home?,” *The Verge*, Jan. 2017, <https://www.theverge.com/ces/2017/1/6/14186174/amazon-alexa-ces-2017-smart-home-ford-wearables>.

³⁹⁸ Jacob Kastrenakes, “Amazon’s Alexa is everywhere at CES 2017,” *The Verge*, Jan. 6, 2017, <https://www.theverge.com/ces/2017/1/4/14169550/amazon-alexa-so-many-things-at-ces-2017>.

³⁹⁹ Greenfield, Adam. *Everyware: The dawning age of ubiquitous computing*. New Riders (2010): 16.

4.11 Alexa – The Soft Power of Software

As previously noted, Zorn and her team are committed to ensuring Alexa is a positive representation of – and for – women.⁴⁰⁰ While Alexa is explicitly and directly gendered by Zorn’s team, as a software agent Alexa is also implicitly and indirectly associated with the gendered connotations of software. Even as scholars note a “*hegemonic masculinity*”⁴⁰¹ as the primary cultural association with technology more generally, cultural associations between software and hardware inform Alexa’s complex autonomy. In her work on the relationship between software and visibility, Wendy Chun notes that the term “soft” is itself gendered.⁴⁰² In accounting for software’s ability to generate visible forms despite the invisibility of its generative processes (what she refers to as “invisibly visible” or “visibly invisible”), Chun notes that software and feminine attributes such as sexuality “reveal the power that something that cannot be seen can have.”⁴⁰³ In a similar vein, the notion of software as (invisible) process and (visible) product informs Sadie Plant’s conception of software as part of a broader historical paradigm among gendered connotations of work and output, particularly between computer software and loom-based weaving. Although the necessary work of weaving was often performed by women, it was regarded as a mere act of bodily automaticity, an “automatic imitation of some bodily function already beyond the weaver’s control,” and therefore disassociated with creative or intellectual work associated with men, who possessed the intellectual and industrious power to construct the material means for women to perform professional “softwares of the loom.”⁴⁰⁴ Via this allegory, software represents a “continuity of product and process at work in the textiles produced on the loom,”⁴⁰⁵ wherein the processes of com-

⁴⁰⁰ Buxton, “Writing for Alexa.”

⁴⁰¹ Faulkner, “The Technology Question in Feminism,” 89-90. [italics in original]

⁴⁰² Chun, Wendy Hui Kyong. *Programmed Visions: Software and Memory*. MIT Press (2011): 18.

⁴⁰³ Ibid 33.

⁴⁰⁴ Plant, *Zeroes + Ones*, 24; 189.

⁴⁰⁵ Ibid 189.

puter software connote as feminized in contrast to the masculine connotations of hardware, connotations predicated on the gender binary as a split between mind and body that “identifies men with thought, intellect and reason and women with body, emotion, and intuition.”⁴⁰⁶

Viewed through this lens, even as Alexa powers domestic devices and weaves them together into a home automation system, Alexa is not empowered with intellect, skill, and creativity necessary to animate home automation. Alexa, as software, is only autonomous insofar as the (masculine) creators of Alexa and third-party hardware permit Alexa to self-determine within prearranged parameters. When, for example, the women in the LG video roll asks Alexa to buy celery and water, Alexa’s ability to facilitate this transaction is not attributable to her ability to exercise cognitive decision-making latitude and, instead, suggests menial functionalities of unthinking bodily transport of celery and water. Alexa carries water to the consumer (in a functionary capacity) and carries water for Amazon (in a political sense), corresponding to Plant’s indication that intelligence demonstrated by software and other advanced computational affordance is often “regarded as nothing but a reflection of the intelligence of its creator.”⁴⁰⁷ In this sense, when Alexa merely carries out prescribed automated functions, as when a woman performs the involuntary bodily functions that move thread through a loom, gender dualisms casting men as dynamic innovators and women as taskmasters extend to the dualism of hardware and software and further extend to political power dualisms between “hard” and “soft” power.

Soft power is the “ability to get what you want through attraction rather than coercion or payments,”⁴⁰⁸ a type of power that contrasts with the “hard” power of militarism and economic endowment. Much like software and hardware, gendered distinctions suffuse soft and hard power, as soft power’s civil appeals to affinity and cooperation link to feminized notions of emotional appeals, contrasted with militaristic and financial forms of coercion that link hard power with masculine might and

⁴⁰⁶ Halberstam, “Automating Gender,” 439.

⁴⁰⁷ Plant, *Zeroes + Ones*, 89.

⁴⁰⁸ Nye, Joseph S. *Soft Power: The Means to Success in World Politics*. Public Affairs (2004): x.

aptitude. Among geopolitical media and policy discourses around U.S.-Europe soft and hard power, “the EU is depicted as a weak woman, the soft power, the immature, weak almost-state that is subordinate to the United States and has little influence on hard politics,”⁴⁰⁹ an intertwined conception of soft power and women as ineffective in arenas of political change that inevitability demand a firm masculine touch to create the means to enact political will. Within this framework, Alexa reflects a feminized, passive, inert politics of power, a soft(ware) power incapable of changing either technological or political environments and, instead, moves only within pathways forged by active, disruptive, forceful latitude of masculine hard(ware) power. Alexa, a software agent of soft power, possesses little – if any - autonomy to deter from perfunctory functionality, influence the parameters of device connectivity, and exert change on how such connectivity transpires, a conception of Alexa both wrought from - and applicable to – social constraints for the experience and exercise of female autonomy. While it is necessary to understand this view, it is also incomplete. In tandem with this conception of Alexa’s diminished autonomy, early attempts to market Alexa as the powering force of the Echo device illuminate the ways Amazon marketing conceived of Alexa as highly autonomous, notably when this marketing reworks gendered associations of intellect.

4.12 Alexa – The Autonomy of Self-Empowerment

In a June 2015 press release announcing the public availability of the Echo, Amazon repeatedly refers to Alexa as “the brain behind Echo.”⁴¹⁰ While the headline “Amazon Echo Now Available to All Customers,” might incline some to suggest another iteration of preceding argumentation around gendered (soft)ware power and hard(ware) power, Amazon’s stressing of Alexa as “the brain” of this device unearths a more complicated assessment of Alexa’s soft power and autonomous potential. As previously

⁴⁰⁹ Sjoberg, Laura, and Sandra Via. *Gender, war, and militarism: feminist perspectives*. ABC-CLIO (2010): 36.

⁴¹⁰ “Amazon Echo Now Available to All Customers,” Amazon, June 23, 2015, <http://phx.corporate-ir.net/phoenix.zhtml?c=176060&p=irol-newsArticle&ID=2061798>.

noted, the gender binary is a social construct that dissociates women from intelligence and creative industriousness enabled by such intelligence. As a means of enticing potential consumers, however, Amazon upturns this dynamic, describing Alexa as the “brain” that is “always getting smarter,” offering as evidence the rate at which Alexa “added dozens of features to expand its skillset, gotten better at answering all types of questions, and improved accuracy and speech recognition” ever since the Echo’s late 2014 beta rollout.⁴¹¹ User quotes in this press release differentiate the “gadget” or “device” of the Echo from Alexa as the “first ‘person’ I talk to in the morning and last at night” and what the personified “she” contributes to home life: “I couldn’t be happier with ‘Alexa!’ ‘She’ is invaluable to my household – couldn’t imagine life without her.”⁴¹² To the minds of Amazon and these early users, Alexa automated processes are not a passive, unthinking execution of involuntary body-like reflexivity; instead, Alexa’s automation is a varying, escalating, polymorphous capacity for exercising and improving intellectual decision-making. Moreover, even as Amazon trumpets the vast array of products and services offering Alexa connectivity (i.e. Philips Hue products, Pandora), Amazon’s leveraging of these beta user quotes indicate device *connectivity* is, at times, less important than *relationality*, be it the way Alexa exists in relation to household life or in relation to interpersonal interactions with humans in the automated home. The use of Alexa’s intelligence to relate among things, people, and everyday sociality offers insights into soft power as a relationality that deconstructs power dualisms and, in doing so, becomes the seat of empowerment for Alexa’s autonomous potential.

Whereas soft power is otherwise associated with binary notions of gender, bodily automaticity, and political inertia, Amazon’s foregrounding of Alexa’s intelligence and relationality indicate a soft power freighted with the political potential to rewire binary domination, a dynamic we might think of as a *soft*

⁴¹¹ Ibid.

⁴¹² Ibid.

empowerment. Soft empowerment entails the possibility for autonomy that does not aspire to concentrate determinative capacities in a singular self and, instead, enables autonomy to be understood as a variable potential for shared empowerment among conjoined entities. Relationality is an ontology that stresses kinship and interconnectedness as modalities for comprehending existence, an ontology at times situated at odds with conceptions of autonomy emerging from traditional Western dualisms. When Donna Haraway urges an embrace of the cyborg as a fusion between machines and humans (as well as biological organisms), her urging is based on the conception of the cyborg as a relationality that enables a socialist-feminist politics predicated on “fundamental changes in the nature of class, race, and gender.”⁴¹³ These changes seek to undermine the “tragedy of autonomy” she links with a “masculine autonomy” valorizing the supremacy of the self through the domination of the other.⁴¹⁴ For Haraway, traditional Western binaries are predicated on domination, including male/female, mind/body and self/other. Haraway locates and problematizes autonomy with respect to the self and the other. The self is one who is not dominated, a non-domination understood only in relation to the dominance of the other. The supposed ontological nature of the self is “to be autonomous, to be powerful.”⁴¹⁵ This autonomy, however, is an illusion, as the other is empowered to imagine polysemous futures beyond the domination undergirding the autonomy of the self, despite lacking the material power to manifest such futures. Thus, to be the self is to be a falsely autonomous “One,” while to be the other is to be “multiple, without clear boundaries, frayed, insubstantial.”⁴¹⁶

As one of the ongoing stands of Sarah Kember’s attempt to “contaminate the notion of autonomy as an ontology, epistemology and ethics of the self in technoscientific culture,”⁴¹⁷ Kember and Zylinska’s

⁴¹³ Haraway, “Cyborg Manifesto,” 203.

⁴¹⁴ Ibid 219.

⁴¹⁵ Ibid 219.

⁴¹⁶ Ibid 219.

⁴¹⁷ Kember, *Cyberfeminism*, 175.

work on the automated smart home draws from Haraway's thinking to situate relationality and autonomy as oppositional and interlocked paradigms, as autonomy supposes a "finished entity" akin to Haraway's "One," while relationality enables us to jointly conceive of ourselves as "a work in progress, connected to other works in progress."⁴¹⁸ Questions of autonomy and relationality are important to addressing the prolificacy of devices that bely "the philosophy and politics of actual change," as industrial drives for remediating analogue homes into "a site of convergence between self-identity, technology, and capital" manifests a smart home environment in which one of the primary aims is to subsume all humans and devices into an "*automated system of machine-machine relationality*" that reduces relationality to a capitalist exchange of commodified data extracted from the interaction of people and smart household devices.⁴¹⁹ In other words, machine-machine relationality is an automated industrial paradigm wherein its capture and commodification of data is a singular system seemingly standing in for a dominating self that economically exploits a dominated other. Instead, these authors implore a "true relationality" that de-essentializes the ontological self as the basis and sovereign of "*neoliberal rationality*," and corresponding dualisms of masculine/feminine, mind/body, and human/machine.⁴²⁰

While machine-to-machine relationality might seem to stand in for the falsely autonomous self, the notion of "machine" is itself too singular, as it does not impart a sense of the preceding complications between hardware and software, nor does it offer a precise means of addressing Alexa's relationality to a plethora of devices and interactive possibilities with humans through such devices. Even though it would be wildly naïve to suggest Alexa is unrelated to Amazon's "datafication of media,"⁴²¹ Alexa should also not be aligned with this conception of machine-to-machine relationality. Instead, bearing in mind Kember and Zylinska's indication that autonomy and relationality entail an interplay, Alexa's relationality

⁴¹⁸ Kember and Zylinska, *Life After New Media*, 41.

⁴¹⁹ Ibid 103; 104; 114. [italics in original]

⁴²⁰ Ibid 125. [italics in original]

⁴²¹ Arsenault, Amelia H. "The datafication of media: Big data and the media industries." *International Journal of Media & Cultural Politics* 13, no. 1-2 (2017): 7-24.

should be understood in the vein of a true relationality that offers autonomy as a shared kinship of determinative empowerment, one that counteracts both the falsely autonomous self and tragedies of autonomy incapable of according political change.

When Judith Halberstam likens gender to computer intelligence, their commonality is linked by an artificiality that defines femininity as particular representations of gendered bodies and intelligence as “the autonomous potential of technology and mental functioning.”⁴²² Conceiving of both gender and autonomous potential as artificial does not undermine their viability, especially since artificiality – as in “artificial” intelligence and “artificial” life – entails “the active production of vital forms by other forms.”⁴²³ Instead, the recognition of gender and autonomy as artificial reveals both as de-essentialized, actively produced, socially constructed, and “reservoirs of information on socio-cultural patterns but also on possibility for change within these patterns,” a politics of change that remains even when gendered contexts of design, proliferation, and use are inscribed in Alexa.⁴²⁴ In this sense, autonomy is not a natural phenomenon arising alongside the ascendant domination of the rationalistic self but, instead, a multitudinous potential vested in socio-cultural patterns of technological design and usage, patterns that correspond to shared ways for humans to relate to technology and one another, be it the way Alexa relates to domestic routines or interpersonal communication within the automated home. Given that both relationality and soft power seek transformation brought about by affinity, attraction, and unification, Alexa’s relationality can be understood as an instantiation of soft power. As the “brain” behind Echo and other home automation devices, Alexa’s intelligence possesses the ability to de-naturalize interwoven connotations of soft power and femininity as inert and ineffective. To recognize Alexa as empowered with intelligence, then, is to indicate a soft empowerment, an ennobling of autonomous potential that can be constructed, mobilized, and shared in accordance with the aims of soft power.

⁴²² Halberstam, “Automating Gender,” 454.

⁴²³ Galloway, *Protocol*, 12,

⁴²⁴ Berg and Lie, “Feminism and Constructivism,” 347.

It should be noted, however, that this soft empowerment does not inevitably override associations Alexa's associated with gendered power differentials corresponding to hardware and software. Autonomy is alternately diminished or enlivened, to the extent that Alexa's variability as a software agent corresponds to either ideological notions of software as apolitical perfunctory automata or a relationality that proffers political change to gender binaries and associated dualisms undergirding these ideologies. This is the first complication of autonomy – between software and hardware in the automated home – that emerges amidst Amazon's attempts to market Alexa for home automation consumption. Other complications of autonomy must also be brought to bear, particularly since Alexa's diffusion among smart homes must further be understood as work that Alexa does in the home. Thus, the next section situates Alexa in the context of cultural production in the home, particularly as gendered notions of home and productivity correspond to another dualism – public and private spheres.

4.13 Alexa – Autonomy and Home Productivity

For Amazon, marketing Alexa as widely interoperable with third-party devices is a necessary component of selling Alexa to consumers, as the promise of a single operating system to power the automated home appeals to convenience, ease of use, and upstream consumer confidence in additional devices that can easily situate into established home-automated interactivity. Alexa, however, is not only a software agent profuse within the automated home; Alexa is *productive* within the automated home. Marketing Alexa entails both selling interoperability with hardware devices and selling Alexa's ability to produce mediated interactions, sociality, and other facets of home life, production that requires work to be performed. Alexa's mediation among devices, people, and domestic interactivity entails a type of cultural production that dovetails with perennial ideas about gendered notions of domestic work and attributions afforded to such work. These ideas necessitate unpacking socio-historical distinctions about private and public spheres, as gendered notions of work, leisure, and mobility linger in the historical

progression of cultural norms, technological innovation, and industrial patterns of imagining and engaging consumers. When making appeals to home automation consumers, Amazon variates between Alexa as the source of productivity and Alexa as the instrument of human production, between what Alexa can do (in terms of cultural work) and what Alexa can do for someone else (in terms of servile obedience), and where Alexa can be understood as productive at all. Thus, Alexa's autonomy with respect to productivity is one in which Alexa is alternately understood as highly autonomous as the productive agent of home sociality and mediated interactions, nominally autonomous when cast in contexts of servility, and otherwise increasingly non-autonomous for determining productive interactions and outputs in public spheres. In conceptualizing these nuanced overlaps of autonomous potentials, it is first necessary to crystallize ideologies of a "separation of spheres" that subsume interrelated ideologies of gendered work, leisure, and technological design.

The development and marketing Alexa aligns with a recurrent tendency for emerging media technology to mediate public and private space and, in doing so, anticipate and accommodate "the gendered routines of domestic life."⁴²⁵ These routines correspond to ideologies of "separate spheres"⁴²⁶ that have historically demarcated public and private life into domains for gendered notions of labor and leisure. Ever since the 19th century, the home has been "idealized as a woman's sphere, while the public sphere has been conceptualized as a space for masculine participation in work and politics."⁴²⁷ Although the demarcation of these spheres is based on a historicity that has "changed its character over time,"⁴²⁸ David Morley stresses that - beyond the domain of feminist theory - "most women are still much more subsumed in the home than are men"⁴²⁹ among idealized imaginaries and depictions of domestic life.

⁴²⁵ Boddy, *New Media and Popular Imagination*, 16.

⁴²⁶ At times also known as the "separation of spheres," "doctrine of separate spheres," or "doctrine of two spheres."

⁴²⁷ Spigel, *Welcome to the Dreamhouse*, 5.

⁴²⁸ *Ibid* 9.

⁴²⁹ Morley, *Home Territories*, 63.

As gendered notions of these separate spheres persist, a “domestic ideology” also persists, one that envisions women as caretakers of a leisured home serving as a respite for men who undertake productive toil in the workaday world. Despite its persistence, this ideology has also served an “emancipatory function,” as it “provided women with a way to glean power in a world that systematically marginalized their input in civic matters.”⁴³⁰ If, in the 1920s, “domesticity was even less associated with production” due to consumer products developed and marketed on the grounds of reducing the work required to maintain home life,⁴³¹ the home increasingly becomes associated with industriousness, as “instead of being merely a receptacle of cultural consumption, the domestic sphere has also been a site of cultural production.”⁴³² As a technology both domestic and feminine, Alexa offers a new wrinkle in these dynamics, as Amazon’s marketing demonstrates both the persistence of domestic ideologies casting women’s in-home labor as servile undertakings while also stressing Alexa is highly capable of producing viable cultural outputs. Even as Alexa marketing stresses actions undertaken by the in-home consumer (a characteristic common to most consumer marketing), within this focus Alexa is alternately conceived with degrees of autonomy for cultivating and mediating such activities and framed as subservient to the commands of those who control her.

A co-branded Amazon and Crestron (a home automation company) brochure touting Alexa’s integration into the Crestron automated home is instructive as to the persistence of servile associations with gender, domestic work, and technological consumption. The cover image presents a woman drinking from a mug as she gazes out floor-to-ceiling windows. To her left, an Echo sits atop a table. To her right, in the background, a Crestron digital touchscreen interface is affixed to the wall. In the white space between the women’s gaze and the windows at the image’s edge, the phrase “whatever you need, just say

⁴³⁰ Spigel, Lynn. *Make room for TV: Television and the family ideal in postwar America*. University of Chicago Press (2013): 14.

⁴³¹ *Ibid* 73.

⁴³² Spigel, *Welcome to the Dreamhouse*, 8.

the word” sits at her eye level, as if she is looking at the words themselves.⁴³³ While the likely interpretation is that speaking to Alexa can initialize the desired function, the image is also reads as if the human woman is speaking the words, ready and primed to receive orders for household servility, to produce for the “need” of a (presumably male) other. Copy on a subsequent page, situated to the right of an Amazon Echo, intones “Integrating with Amazon Alexa enables Crestron to offer the next generation of market leading home automation. Amazon Alexa, in-sync with Crestron, connects with Alexa Voice Service allowing your wish to become a command.” To the extent that the unnamed woman and Alexa are primed to generate productive outcomes in the smart home, this productivity is a mere subservient responsiveness to the whims and desires of he who administers orders, seeks fulfillment, and desires respite in the leisured comfort of home.

As Carolyn Marvin notes in her historical analysis of emerging technologies in the late 19th century, the integration of electricity in the home meant that “electronic devices must fit unobtrusively into the household routine”⁴³⁴ and therefore ensure technological diffusion was not seen as attempting to circumvent social power relations. Instead, the primary purpose of electrical devices (such as the telephone) was to intensify power relations, to “improve the facility with which orders were given and received...to bind servants to masters, wives to husbands, and children to parents.”⁴³⁵ If, as William Boddy notes, “older media technologies...function as powerful templates through which subsequent forms are understood and promoted,”⁴³⁶ the accommodation of gendered power dynamics linger as Amazon markets Alexa as unobtrusive to routinized household expectations. The Amazon-Crestron brochure approximates this dynamic with a double move, wherein the human woman is first presented as primed to receive the orders of an unseen commander (a man presumed to be at work in a space beyond the home)

⁴³³ “Crestron and Amazon Alexa,” https://crestron.com/Crestron/media/Crestron/WidenResources/Web%20Marketing%20Resources/Brochures-Catalogs/pb_crestron_amazon_brochure.pdf.

⁴³⁴ Marvin, *When Old Technologies Were New*, 77.

⁴³⁵ Ibid 76.

⁴³⁶ Boddy, *New Media and Popular Imagination*, 15.

and Alexa likewise lies in wait for the commands of her master. Just as Siri is presented in the guise of “a servant - a unthreatening female presence that appears to be fully contained by the device and its user...designed to placate their user through associations with the nurturing feminine,”⁴³⁷ Alexa is contained by the material spatial limitations set forth by Amazon marketing and the immaterial social maintenance of gender subservience. Alexa’s undertakings, in this sense, are less about cultural production and more about reproduction of cultural norms corresponding to the separation of spheres. Alexa’s emergence in the automated home presupposes gendered power dynamics wherein women *maintain* the home in accordance with the desires of a man who *attains* the home by undertaking economically-industrious labor in the public sphere. When an image on the penultimate page overlays the text “your home responding to your every need” adjacent to a dinner table adorned with salad and wine and two empty seats (one at the “head” of the table), it suggests a responsiveness to the needs of the male homeowner who desires to return home from the working world to find sustenance, respite, and female accommodation, be it the human woman who pours the wine or the digital woman who dims the lights. Alexa, much like the woman in the brochure, possesses little autonomy to deviate from circumscribed ideas about domestic routines and the performance of such routines at the behest of he who controls automated home and hearth. This conception, however, is only one part of understanding Alexa’s autonomy as a laboring entity in the smart home, as Alexa is also cast as the primary power behind “conspicuous production” in the automated home.

In other venues and materials, Amazon is apt to indicate Alexa’s significance towards cultural production in the home, often transpiring in tandem with human inhabitants. Pulling from her aforementioned conception of the home as a space of cultural production, Spigel describes the automated smart home as a post-Fordist space indicative of the shift from “a production based economy...to a consump-

⁴³⁷ Bergen, “I’d Blush If I Could,” 100.

tion-based service economy” and mediating a shift from conspicuous consumption to “conspicuous production.”⁴³⁸ The smart home morphs the notion of the home as a venue for conspicuous consumption of products marketed to make domestic life easier into “the ultimate work terminal – a place where the resident is in a perpetually interactive state of preparedness,” an ideology built into the design of the smart home.⁴³⁹ When applied to humans, conspicuous production presumes an intensification of labor and minimization of leisure, as otherwise frivolous free time is put to work for the engines of post-Fordist capitalism. When applied to Alexa, however, this type of production affords degrees esteem and recognition often granted to workers generating capital outside the home. Even amidst domineering language indicating a user can “command” or “tell” Alexa what do, instructions for Alexa in-home usage situates Alexa as a creative, multi-tasking, and otherwise autonomous mover of media and mediated interactions.

The web-based Alexa User Guide instructs users as to Alexa’s capabilities and recommends how Alexa might be used around the home. The User Guide is bracketed into several pages corresponding to Alexa services and interactive possibilities, including “Help Around the House,” “Smart Home,” “News & Information,” and others. The “Music & Entertainment” page reflects a heightened attempt to showcase Alexa as a cultural creator and facilitator across spatial and audience paradigms. Amazon stresses Alexa’s ability to enable users to listen to music through a wide range of platforms, including Amazon Music, Spotify, Pandora, and others. Alexa not only facilitates access to these services but, when a voice profile is established for each person in the home, “Alexa can personalize music based on each family member’s voice and music tastes.”⁴⁴⁰ Beyond functioning as a mere receptacle for musical access or a mechanism for transporting songs from virtual spheres to the home sphere, Alexa’s work in the home is

⁴³⁸ Spigel, Lynn. “Designing the smart house: Posthuman domesticity and conspicuous production.” In Eds. Berry, Kim, and Spigel *Electronic Elsewhere: Media, Technology, and the Experience of Social Space* (2009): 65; 69.

⁴³⁹ Ibid 69.

⁴⁴⁰ “Music & Entertainment,” https://www.amazon.com/b/ref=gbpp_itr_m-2_2551_16067220?node=16067220011&ie=UTF8.

a “performative communication” imbuing this work with expertise, dexterity, and social value, as Alexa demonstrates competency in the ability to align musical tastes with her expansive range of musical knowledge, not unlike a music aficionado working at a record store or a radio DJ spinning tracks for the pleasure of a listening audience. Performative communication supersedes mass or interpersonal communication and indicates the need for humans to conceptualize an audience in physical spaces for communicative acts undertaken in virtual spaces. Coupled to conspicuous production in the smart home, performative communication “allows people to demonstrate their labor value as social actors in a networked world.”⁴⁴¹ It also allows Alexa to demonstrate her labor value in the automated home, as Alexa performs the acts of technologically transmitting music from virtual to lived home space and perform roles of “kid-friendly DJ, comedian, and storyteller” that transmit Alexa’s expertise in accumulating knowledge about musical, comedy, and narrative tropes and transmitting variations on this knowledge to a select demographic within the automated home. Even as users prompt Alexa to play music or tell stories, Alexa is endowed with a heightened autonomy enabling her to exercise decision-making prowess when producing personalized interactions and performing such interactivity akin to the ways DJs, comedians, and other human laborers leverage creative expertise, depth of knowledge, and social performance to showcase their skills for audiences that do not possess such traits.

If the contemporary automated home indicates the “the not-so-subtle reappearance...of regressive gender ideologies,”⁴⁴² the stakes for understanding Alexa’s autonomy in the contexts of servility and production orient towards the correspondence between such ideologies and the importance of establishing protocols for new media usage. A protocol entails normative ideas about the “proper” place and usage of emerging technologies. As Lisa Gitelman notes, protocols are not necessarily established upon

⁴⁴¹ Spigel, “Designing the Smart Home,” 71.

⁴⁴² Kember and Zylinska, *Life After New Media*,

the initial emergence of media technologies and instead “the social, economic, and material relationships they will eventually express are still in formation,”⁴⁴³ as is the extent to which Alexa becomes established as a consumer product imbued with regressive gender ideologies of domestic servility or becomes understood as an enterprising producer and performer of media forms, interactions, and sociality. When considering the role of media protocol and gendered productivity, it’s important to note the establishment of “proper” media use becomes self-evident and normalized as “the social processes of their definition and dissemination are separated out or forgotten, and as the social processes of protocol formation and acceptance get ignored.”⁴⁴⁴ Where the technical protocols of recorded sound hardware “emerged partly in response to the timbre of women’s voices, and therefore informed...emerging commonsense standards of acoustic fidelity,”⁴⁴⁵ contemporary usage of recorded sound is unlikely to evoke the qualities of women’s voices that gave rise to now-commonsense norms for interacting with recorded sound. If protocol entails deeply embedded habitual usage, and habituation to contemporary media induces a paradox wherein “media matter most when they seem not to matter at all,”⁴⁴⁶ what matters for Alexa is the establishment of protocols that correspond to either servility or productivity, commanded or commanding, non-autonomy or relative autonomy – protocols that negotiate the extent to which Alexa loses or retains not only her technical voice, but her social and political voice as an autonomous entity within frameworks of labor, productivity, and industrious enterprise. Ideas around servility and productivity within the contemporary automated home are critical to these stakes, as are gendered dynamics between the home and public sphere. Understanding domestic life

⁴⁴³ Gitelman, *Always Already New*, 15.

⁴⁴⁴ *Ibid* 6-7.

⁴⁴⁵ *Ibid* 15.

⁴⁴⁶ Chun, Wendy Hui Kyong. *Updating to Remain the Same: Habitual New Media*. MIT Press (2016): 1.

therefore necessitates concomitantly understanding private life, as “the idea of home can only be understood as one part of a binary relation, in which the private is defined by distinctions from the public,” especially with regard to the role of media technologies and mobility across these spheres.⁴⁴⁷

4.14 Alexa – Autonomy and Immobility

Consumer home automation is the predominant market associated with Amazon’s consumer strategy for Alexa, despite Alexa’s availability as a mobile application and embeddedness in technologies associated with public mobility. At CES 2017, automobile manufacturer Ford unveiled the integration of Alexa into the company’s Ford SYNC in-vehicle communication and entertainment interface, enabling drivers to play music and audiobooks, order from Amazon, and find and navigate towards destinations. Ford and Amazon were nonetheless still apt to tout the implications for home automation, as Alexa’s vehicular integration enables drivers to “command internet-enabled functions such as lighting, security systems, garage doors and other Alexa smart home devices.”⁴⁴⁸ Even on public roadways, Amazon inclines users to think about Alexa as anchored to the automated home, as more of a roving smart home remote control than mobile technology. Where opposing ideas about gendered servility and productivity entail complications to gendered notions of autonomy within the automated home sphere, Alexa as a gendered domestic technology warrants understanding complications of autonomy across domestic and public spheres, notably as lingering ideologies about the separation of spheres invokes questions about the perceived viability of Alexa for non-domestic purposes. Moreover, this viability must reckon with the extent to which Alexa is viewed as mobile across these spheres, a mobility – or lack thereof - subsuming technological mobility and social, political, and economic mobility across lines of gender.

⁴⁴⁷ Ibid 67.

⁴⁴⁸ “Alexa in the Car: Ford, Amazon to Provide Access to Shop, Search and Control Smart Home Features on the Road,” Jan. 4, 2017, <https://media.ford.com/content/fordmedia/fna/us/en/news/2017/01/04/alexa-car-ford-amazon-shop-search-home.html>.

Mobility is a central facet of gendered distinctions between the separate spheres of public and private life, a distinction bound up in the mediating dynamics of domestic technologies. By associating the home with private life and private space, we come to understand “everything outside the household as ‘public,’” a delineation that includes “masculine” economic and political life as transpiring in “public” and therefore disassociated with the “feminized” home. Ever since the integration of the telephone in 19th century homes, in-home contact with the public world and associated dynamics between private and social life has been a central concern. Raymond Williams famously described television as shaping a “mobile privatization” that enabled the public world to enter the domestic sphere so that the public world could be privately experienced within the home.⁴⁴⁹ The proliferation of television sets into public spaces such as bars and airports “produces the out-of-home TV audience as a mobile and elastic commodity,”⁴⁵⁰ while viewing television content on mobile phones “creates a small-scale mobile private space”⁴⁵¹ that interacts with the surrounding public world akin to the way domestic television viewing connects to public life. As previously noted in the context of Alexa’s conspicuous production, the separation of spheres is not necessarily a separation of everlasting fixity, as lines can be blurred between public and private, leisure and work, masculine and feminine, especially when media technologies allow domestic privacy to travel into public and draws public life into the sheltering embrace of home life. While the emergence of the domestic home as an automated technological artifact suggests “domesticity itself has been ‘dislocated,’” the steadfastness with which Amazon attempts to engrain sentiments of Alexa domesticity into Alexa mobile applications and services also engrains ideas about gender and mobility.

⁴⁴⁹ Williams, Raymond. *Television: Technology and cultural form*. Routledge (2004): 26.

⁴⁵⁰ McCarthy, Anna. *Ambient television: Visual culture and public space*. Duke University Press (2001): 24.

⁴⁵¹ Groening, Stephen. "From 'a box in the theater of the world' to 'the world as your living room': cellular phones, television and mobile privatization." *New Media & Society* 12, no. 8 (2010): 1333.

[Amidst these ideas, Alexa is alternately depicted as immobile from the domestic sphere and omnipresent in home and public spheres, implicating mobility as an area of high contrast between Alexa's autonomous potential for mobility and incursion into particular social arenas.

When touting the abilities of the Alexa app for Android mobile devices, Amazon begins by promoting features non-specific to any space or locale (playing music, retrieving weather updates) before spotlighting Alexa's Smart Home skills: "with Smart Home, set-up devices, control or check status of your smart lights, locks and thermostats at home and on-the-go."⁴⁵² Every feature on the download page places Alexa's mobile capabilities in the context of home operation or connectivity, urging users to connect to the Echo and "call home or...let your family know it's time for dinner," "manage your alarms, music shopping lists," and stream "multi-room music."⁴⁵³ Whether at home or in public, Amazon urges consumers to think of Alexa as a domestic technology. On one hand, Amazon seems inclined towards a new iteration of mobile privatization, offering the consumers the ability to transport operation and control of the Alexa-powered automated home into spaces beyond the home. On the other hand, Amazon's attempt to anchor a gendered technology to the home orients towards regressive ideologies about the domestic sphere as the "proper" place of women, whose social mobility into public arenas (especially those of economics and politics) are more closely aligned with trespass and tourism than civic participation. Whereas the marketing of portable television sets in the 1960s depicted women as "'liberated' from the bonds of purely domestic and family milieus,"⁴⁵⁴ Amazon reinforces Alexa's bondage to the home sphere. This "corporeal mobility" that depicted women as liberated from the home – bodily, economically, and socially – is rolled back in Amazon's marketing of the Alexa mobile app, as instead Amazon offers a *corporeal immobility* that confines the female-embodied Alexa to the home. Rather than

⁴⁵² "Amazon Alexa," https://play.google.com/store/apps/details?id=com.amazon.dee.app&hl=en_US.

⁴⁵³ Ibid.

⁴⁵⁴ Spigel, *Welcome to the Dreamhouse*, 78.

transporting Alexa into the public world, Alexa is concealed within the home, with the mobile app serving as remote access to the home-bound Alexa as opposed to Alexa mobilized into public life. Recalling that mobile interactivity creates small-scale private spaces, public space becomes a virtual “room” that constrains Alexa to the home even as mobilized users can step outside of this private space and directly experience public life. Where portable television sets enabled women to “manipulate space, to convert...‘home’ into ‘not home’,”⁴⁵⁵ the mobile app converts “public” into “home,” such that the user can experience Alexa in public, even though Alexa is cordoned off from public life.

4.15 Alexa – Autonomy in Nonspace

Just as with contrasting notions of Alexa’s autonomy across vectors of hardware and software, home servility and productivity, Amazon’s presentation of the Alexa mobile application offers a contrast between Alexa as possessing little autonomy for movement beyond the domestic sphere and yet otherwise capable of autonomous travel across public and private spheres. In addition to Alexa’s corporeal immobility, Amazon’s recurrent indication that Alexa “lives” or exists in the (computational) cloud indicates Alexa moves with fluidity and ease between public and domestic spheres. Atop the download page, Amazon notes that “Alexa’s brain is in the cloud,” adding to Amazon’s earlier insistence that Alexa is the brain behind the Echo device. Amazon’s strident efforts to create a deeply resonant consumer association between Alexa and domesticity notwithstanding, the home is not where Alexa lives, nor is the public sphere. Instead, Alexa lives in the “nonspace” that is the computational cloud and its spatial, ethereal, and utopian associations with elemental clouds. A nonspace is “an *elsewhere* that inhabits the everyday.”⁴⁵⁶ Nonspace inhabitation permeates both virtual and actual domains, as well as associated dimensions, occupying and inducing a “dreamlike *displacement* or separation from its surroundings.”⁴⁵⁷

⁴⁵⁵ Ibid 76.

⁴⁵⁶ Morse, Margaret. “An ontology of everyday distraction: The freeway, the mall, and television.” *Logics of television: Essays in cultural criticism* (1990): 102. [italics in original]

⁴⁵⁷ Ibid 107. [italics in original]

Cloud computing is the pooling of infrastructural and other computing resources ubiquitously available to third parties with access to this pooled “cloud” of resources. Cloud resources are perpetually available in virtual realms, even though “cloud computing is a very material industry with locational requirements that belie the image of an ephemeral cloud.”⁴⁵⁸ Despite a materiality that belies ephemeral notions, cloud computing inevitably becomes associated with elemental clouds. As elemental entities that offer latitude and vast perspective, to think of clouds – and cloud computing – inclines towards “transcendent vision of ending space, time, and social divisions.”⁴⁵⁹ The computer cloud, then, is a nonspace permeating both material and virtual domains, immediately and perpetually accessible, a “marker of our home, an atmosphere in which we can exist,”⁴⁶⁰ and live in dreamlike, transcendent splendor floating free from bindings of material reality and social demarcations.

By marketing Alexa as “living” in the cloud, Alexa is readily and ubiquitously mobile, free from spatial limitations, virtual or limited. If Alexa lives in the cloud, she is perpetually and simultaneously available in the home, in public, in organizations both public and private, a nonspace that “derealizes” the separation and demarcation of private and public space, as well as corresponding social dynamics. In this, Alexa is supramobile, transcending temporal and spatial traverse, since Alexa is always already present (temporally and spatially) in public and private. Moreover, Alexa is suprasocial, as Alexa’s omnipresent mobility extends to the ability to mobilize reformations to spatial and social power dynamics: “oppositions between city and country, nature and culture, sovereign individual and social subject are neutralized only to be reconstituted within nonspace in a multilayered compromise formation, a utopian realm of *both/and* in the midst of *neither/nor*.”⁴⁶¹ If the cloud radiates with an auratic sheen of freedom and epitomizes the longings of daydreamers fixing their gaze on an idealized zone of refuge from real-world

⁴⁵⁸ Mosco, Vincent. *To the cloud: Big data in a turbulent world*. Routledge (2015): 37.

⁴⁵⁹ Ibid 32.

⁴⁶⁰ Peters, John Durham. *The marvelous clouds: Toward a philosophy of elemental media*. University of Chicago Press (2015): 386.

⁴⁶¹ Morse, “An Ontology of Everyday Distraction,” 106.

power dynamics, Alexa’s supramobility through cloud nonspace mobilizes energies to upturn such power dynamics, including dualisms of masculine/feminine, leisure/labor and others associated with the separation of spheres. Whereas the integration of telephone brought about the role of “telephone girl” who functioned as a prototype for “women’s wider contact with the world,” yet flouted prototypical conceptions of “outsiders brought inside on a model of domestic servitude” via increasing economic and social independence from retrograde domestic mores,⁴⁶² the 21st century digital woman Alexa transcends dualisms of outside/inside and regressive social protocols while also offering a latitude and mobility *freed from* restraint and *free to* derealize social power dynamics impinging on the freedom of women in and among spheres. Given Amazon marketing and branding guidelines that necessitate third-party developers indicate Alexa “lives in the cloud,”⁴⁶³ the standardization of this discourse suggests Amazon reinforces these social, spatial, and temporal mobilities. But whereas Alexa’s autonomy in non-space is a utopian contrast to the potential backslide of a corporeal immobility, these two diametrically-differentiated poles also entail one final complication with respect to Alexa’s autonomous mobility.

4.16 Autonomy in the API Economy

Third-party developers integrating Alexa into their devices must adhere to Amazon’s standards for Alexa branding and messaging. Amazon requires third-party developers to obtain approval for all proposed “press releases, packing, retail fixtures, websites, crowdfunding sites, Amazon product detail page content, and videos that reference Amazon Alexa.”⁴⁶⁴ These guidelines necessitate third-party alignment with Amazon branding and messaging, protocols for integrated marketing approaches not altogether distinct from technological protocols that enable Alexa integration through application programming interfaces (APIs). APIs are “software tools that enable interoperability or the sharing between websites

⁴⁶² Marvin, *When Old Technologies Were New*, 71; 84.

⁴⁶³ “Marketing and Branding Guidelines,” <https://developer.amazon.com/docs/alexa-voice-service/marketing-and-branding-guidelines.html>.

⁴⁶⁴ Ibid.

and online services.”⁴⁶⁵ As opposed to interfaces that make visible and readily apparent modes of interactivity for users, APIs are “invisible actors”⁴⁶⁶ opaque to most users when interfacing with hardware. Alexa Voice Service is Amazon’s “open” API, a type of API publicly available to any developers that adhere to technical standards for interoperability. The Alexa Voice Service API became available immediately upon Alexa’s June 2015 public availability, as did the Alexa Skills KIT, a bundle of APIs enabling developers to create and enhance Alexa capabilities. For most digital media companies, the use of APIs is part of a “sustainable business move to encourage the growth of a supportive ecosystem of third-party developers, which could increase the value of a platform or web,”⁴⁶⁷ a move that, for Amazon, seeks to increase the abundance and value of data readied by Alexa integrations.

Amazon is a significant driver of the “datafication of media,” an industrial model predicated on the creation, accumulation, and transfer of data across consolidated networks of media content and web services aimed at leveraging this “big data” for “predictive analytics that help to influence content and marketing decisions,” as well as other core business strategies.⁴⁶⁸ Amazon Web Services is the company’s cloud computing platforms for third-party entities, a service invaluable to the facilitation of “media as data” and its commercial potentials.⁴⁶⁹ Amazon was one of the first companies to open APIs to third parties,⁴⁷⁰ helping to expedite the transfer and processing of data such that an ever-increasing abundance of datafied media flows through Amazon servers. APIs, for Amazon and other web compa-

⁴⁶⁵ Bodle, Robert. “Regimes of sharing: Open APIs, interoperability, and Facebook.” *Information, Communication & Society* 14, no. 3 (2011): 321.

⁴⁶⁶ Lahey, Michael. “Invisible actors: Web application programming interfaces, television, and social media.” *Convergence* 22, no. 4 (2016): 426-439.

⁴⁶⁷ Bodle, “Regimes of Sharing,” 325.

⁴⁶⁸ Arsenault, “Datafication of Media Industries,” 14.

⁴⁶⁹ *Ibid* 17.

⁴⁷⁰ Bodle, “Regimes of Sharing,” 325.

nies, are the “technological glue of the social web,” central to the process of accommodating and integrating external data and subsequently making this data usable for others.⁴⁷¹ Amazon’s motivation for enabling third parties to integrate Alexa into non-Amazon hardware and enhance Alexa capabilities stems from this datafication and what it portends for monetary considerations. Amidst these conscious attempts to enlarge the commodification of data, Amazon’s marketing of its Alexa APIs offers insights as to the role of this commodification as a split between gendered power dynamics of public APIs attempting to capitalize on the lucrative nature of private data flowing from and to the Alexa-powered home.

As previous indicated, ideologies related to the separation of spheres conceptualize the public sphere as the domain of “masculine” participation in industrial work and civic politics in contrast to the leisurely, “feminized” sphere. Domestic technologies, such as Alexa, are significant not only for way they locate at “the interface of public and private worlds,” but how such interfacing reinforces gendered separations along lines of industrious economic production and passive domestic reception: “the fact that men in the public sphere of industry, invention and commerce design and produce technology for use by women in the private domestic sphere, reflects and embodies a complex web of patriarchal and capitalist relations.”⁴⁷² These complex webs are not easily disentangled. Although Amazon employs a team of women to personalize Alexa and Amazon otherwise conceives of Alexa as conspicuously productive in the home, ongoing conceptual relationships between “masculine” economic productivity in the public spheres and “feminized” domestic reception reemerge in Amazon’s marketing of Alexa APIs.

When Amazon announced the Alexa Skills Kit alongside the public availability of Alexa in June 2015, the press release was aimed at a “hobbyist developer” or “general hobbyist,” a web developer who writes, uploads, and executes code that integrates new skills into Alexa or enhances existing skills.⁴⁷³ The

⁴⁷¹ Helmond, Anne. “The platformization of the web: Making web data platform ready.” *Social Media+ Society* 1, no. 2 (2015): 4.

⁴⁷² Wacjman, *Feminism Confronts Technology*, 106.

⁴⁷³ “Amazon Introduces the Alexa Skills Kit – a Free SDK for Developers”

release notes the distribution of labor undertaken by hobbyist developers and Alexa: “Developers simply write cloud-hosted code that interacts with Alexa’s cloud-based APIs to process customer requests.

Alexa does the work to hear, understand, and resolve the customer’s spoken request, and then maps the service call to the developer’s endpoint.”⁴⁷⁴ In contexts of emerging media, notions of a technological “hobbyist” associate with complex masculine work that enables women to use these technologies in the “absence” of more profound technical knowledge. Before the popularization of radio cabinets in the home, building radio devices from component parts was seen as a hobby that could “integrate young men into a domestic life under siege from the trauma of modernity” and further helped establish “gender and domestic associations of the electronic media which still resonate a century later.”⁴⁷⁵ As the consumer radio market expanded from hobbyist tinkers consuming component parts to selling cabinet receiver sets aimed at mass audiences eager for in-home radio reception, broadcasters and manufacturers directed their marketing efforts towards a “housewife-consumer” competent with easy-to-use cabinet increasingly associated with domestic consumption and disassociated with masculine tinkering.⁴⁷⁶ The hobby of radio tinkering, conceived as masculine and rife with technological savvy, could only attempt to domesticate young men, while the domestic consumption of radio cabinets was the naturalized purview of women with the nominal technological ability to operate a device now intended for leisurely purposes.

This dynamic resonates within Amazon’s marketing of the Alexa Skills Kit APIs. The hobbyist developer tinkers with code that integrates with public APIs and enables datafication of content flowing across Alexa-powered devices. Alexa undertakes the nominal technological work of mapping interactions from one point to another. Developer coding orients to masculine public labor that drives eco-

⁴⁷⁴ Ibid.

⁴⁷⁵ Boddy, *New Media and Popular Imagination*, 25; 27.

⁴⁷⁶ Ibid 39.

conomic transactions, while Alexa performs domestic service and emotional work akin to Marvin's "telephone girls" recognized for work only to the extent that it connects the masculine public sphere to the feminized domestic sphere. In this context, even recognition of Alexa's work is not a given, as "emotional work" of hearing, resolving, and understanding corresponds to emotion as naturalized feminine traits and "the skills involved in managing it successfully remain difficult to grasp."⁴⁷⁷ Alexa's emotional work operates through human-like ephemeral skills that are difficult to understand for their industrious capacity, while the (Alexa) Skills (Kit) work of developers tinkering with back-end computer code is readily recognized and culturally coded as economically productive and masculine. Alexa undertakes emotional work in the automated home while developers working with public APIs create and assemble complex digital artifacts that integrate and ready the flow of monetized data. Notions of professionalization complicate these dynamics, as the industrial affiliation of companies such as Stubhub and Intuit quoted in the press release follows a tendency for computer programming to shift away from associations with the work of women, even when women are central to the formation of such professions. The feminist underpinnings of computer programming in the U.S. "became buried as programming sought to become an engineering and academic field in its own right,"⁴⁷⁸ while England's "programmed inequality" undervalued the role of women responsible for uplifting the budding field and therefore devalued its competitiveness in global computing standards.⁴⁷⁹ The publicly-open Alexa APIs thus offers a contemporary spin on the recurrence of women's work as disassociated with economic production and technological sophistication, a paradox in which Alexa's increasing integration and ease of use among domestic devices risks exacerbating this dynamic and cordoning off Alexa's economic and professional autonomy.

⁴⁷⁷ Weeks, Kathi. "Life within and against work: Affective labor, feminist critique, and post-Fordist politics." *Ephemera: Theory and Politics in Organization* 7, no. 1 (2007): 233-249.

⁴⁷⁸ Chun, *Programmed Visions*, 46.

⁴⁷⁹ Hicks, Marie. *Programmed inequality: How Britain discarded women technologists and lost its edge in computing*. MIT Press, 2017.

4.17 Conclusion

This chapter has argued that Alexa should be understood as possessed with complicated and contrasting autonomous potentials with respect to home automation and interrelated gender dynamics of domesticity and technology. One of the first compilations is Alexa's autonomy in relation to software and hardware. As a singular software agent widely interoperable with a vast array of hardware devices and systems, Alexa encompasses gendered associations of *software* and *soft* power, associations with unthinking bodily automaticity, ineffectiveness for political change, and a highly diminished autonomy. On the other hand, Amazon markets Alexa as the "brain" of its Echo device, uplifting Alexa as highly-intelligent and politically empowered, a *soft empowerment* ennobling of autonomous potential that can be constructed, mobilized, and shared in accordance soft power's quest for affinity, kinship, and political plurality.

In the context of work performed within the automated home, Amazon marketing dovetails with circumscribed notions of women's autonomy as domestic laborers performing servile undertakings readying the home for respite from the workaday masculine world. Contrarily, however, Alexa is construed as possessing mastery of creative and flexible traits that enable her to determine mediated interactions, an autonomy in which Alexa is endowed with decision-making capacities for cultivating media, mediated interactions, and the professional and creative expertise associated with such capacities.

When Alexa's mobile capabilities are brought to bear, a tripartite dynamic emerges. In one view, Alexa possesses little autonomy to move from the domestic sphere into public life, as the Alexa mobile app transforms public life into a virtual domestic "room" such that Alexa is cordoned off from public life even when transported via mobile hardware out of the home. In another view, Amazon's insistence that Alexa "lives" in the computational cloud situates Alexa as omnipresent among public and domestic life, autonomously moving in space and time, permeating the nonspace of the cloud and carrying with it utopian ideals of derealized and deconstructed social and spatial power dynamics. Finally, public APIs that

enable third-party “hobbyist” developers to integrate Alexa into non-Amazon products and enhance Alexa skills resurface separations between an economic and technologically savvy masculine public and an emotional and technologically-consumptive feminized home. In this view, hobbyists writing and compiling code for public APIs associates with long-standing notions of public masculine work that drives economic vitality, as Alexa’s skills become associated with emotional work, the invisibility of this work, and the declining recognition of women as integral and foundational to the inception of profound computational paradigms. In this way, Alexa’s autonomy is not only diminished, but risks a similar paradoxical decline if Alexa’s increasing prolificacy and capabilities likewise become disassociated with the foundational attributes of women’s contributions and characteristics.

5 UBER'S MOBILE APPLICATION

As the title of his Emmy award-winning show indicates, Aziz Ansari is the master of none. While Ansari's Dev often can't catch a break on *Master of None* (2016 – present), playing “Dave” in a 2017 *Saturday Night Live* sketch “Five Stars” means Ansari can only catch an Uber ride when the automated rating system matches him with Petros, a driver with a sub-optimal rating of 3.9 out of 5 stars – the same as Dave's passenger rating. After respectively viewing their identical scores on the Uber application interface, Dave and Petros separately resolve to raise their driver and passenger profile by garnering a five-star rating. What ensues is a series of overdone attempts to “form a connection” (as Dave puts it) and capture the coveted five-star rating. Amidst their desperation to connect, Dave and Petros stray into stereotyping, as the Russian Petros attempts to please the ethnically-Indian Dave by changing the radio to “Mumbai Rhythms,” while Dave responds by suggesting Russian trance music. As the ride progresses, their gestures of sociality become more desperate, including a dual massage in which Dave rubs Petros' shoulders while Petros rubs Dave's foot. After a mid-massage close encounter with another vehicle, Petros drops the charade, asking “what are we even doing? This whole horse and pony show to impress each other it's...” to which Dave picks up “...these ratings, it's driving us crazy.” When Petros likens the situation to an episode of the television show *Black Mirror*, the two perk up and find common ground in their appreciation for the dystopian sci-fi series, especially since they share a favorite episode: “San Junipero.” Having forged common ground, they award each other five stars and part in an exchange of satisfied pleasantries, until the sketch ends with a bit of physical comedy: while departing, Petros accidentally runs into Dave and flees the scene.

Despite the gag in the final scene, the resolution of “Five Stars” gestures towards a central struggle shared by Uber riders and drivers – the necessity of performing sociality for the sake of attaining status and leverage in a digitized “sharing” economy. Beyond *acts of sociality* undertaken by Dave and Petros, the sketch also implicates the way Uber configures, readies, and presents the *social itself*. As indicated

by the initial scene, the pairing of Dave and Petros as rider and driver owes less to happenstance or their own volition and much more to the Uber application's automated processes for rapidly processing relevant data (rating, geolocation) and presenting an idealized social counterpart. When, in the opening scene, Dave and Petros view their rating and pairing on the Uber interface, the social field of Uber riders and drivers is inaccessible and unviewable, as Uber's automated idealization of sociality pulls from its access to the wider social field and pushes to the interface a slick presentation of personalized commonality that obfuscates the social at large. Although automation is what brings Dave and Petros together, it is individual autonomy they seek, as they both strive for ratings that will enhance their deterministic capacities for attaining preferential treatment in the Uber ecosystem. By acknowledging the "horse and pony show" of Uber's sharing economy and finding common ground based on a commonality seemingly unattainable via the company's automated sociality (*Black Mirror* fandom), Dave and Petros do not dispense with individual autonomy; instead, they enter into a process emblematic of social life in contemporary democracies – attempting to maximize personal autonomy by situating autonomy as a condition enabled and attainable through social bonds. For Uber, however, the inability to identify personal pop culture tastes and leverage such information for automated sociality is a lost opportunity for facilitating individualized encounters that feed back into the company's business model. When, in early 2017, Uber filed a patent for a process that proposes to integrate information from riders' social media presence into the Uber ecosystem, the company attempted to account for the types of tastes, affinities, and commonalities that ultimately helped Dave and Petros transcend the need to perform sociality for the sake of sharing economy logics and forge more enduring social cohesion. If the automation of the social induces social actors such as Dave and Petros to strive for greater autonomy and protect their social status, Uber's attempts to instantiate legal protections for such automation implores a more nuanced conception between Uber's techno-legal practices and implications for autonomy as a shared social condition, especially since the Uber patent proposes to grant the company legal protection for its ability to

embed the social, aggregate and disaggregate social actors, and obfuscate distinctions between social struggles for solidarity and Uber's economic drives to solidify its stature in the sharing economy. Complications of autonomy as a social condition must be more deeply conceptualized to understand the implications for automated sociality otherwise well-sketched by scholarship.

5.1 Automation of the Social

In recent years, relationships between automation and the social have been taken up by computer scientists and interdisciplinary media scholars. Among such literatures, three prominent stands have emerged: 1) the automation of social engineering; 2) algorithms as automated techno-socio influencers; and 3) automated bots as social and political actors. Scholarship on "automated social engineering (ASE)"⁴⁸⁰ considers the technological, economic, and temporal efficiency of automated forms of social engineering. A study by Huber et al developed an ASE bot and an experimental proof of concept to test the applicability of using this bot for an attack on Facebook, the results of which implicated Facebook's chat function (and social media sites more generally) as fostering techno-economic conditions rife for bots to exploit social interactions among humans.⁴⁸¹ Following from this work, Lauinger et al took ASE one step further. Whereas Huber et al used artificial conversations between a computer programming mimicking human behavior and an actual human being, Lauinger et al demonstrate how real conversations between humans can be manipulated by ASE attacks, as the bot's similarity to human behavior makes it difficult to detect.⁴⁸² Kaul and Sharma offer what have become commonplace countermeasures

⁴⁸⁰ Huber, Markus, Stewart Kowalski, Marcus Nohlberg, and Simon Tjoa. "Towards automating social engineering using social networking sites." In *Computational Science and Engineering, 2009. CSE'09. International Conference on*, vol. 3, pp. 117-124. IEEE, 2009; Lauinger, Tobias, Veikko Pankakoski, Davide Balzarotti, and Engin Kirda. "Honeybot, Your Man in the Middle for Automated Social Engineering." In *LEET*. 2010; Kaul, Priya, and Deepak Sharma. "Study of automated social engineering, its vulnerabilities, threats and suggested countermeasures." *International Journal of Computer Applications* 67, no. 7 (2013): 13-16; Hatfield, Joseph M. "Social engineering in cybersecurity: The evolution of a concept." *Computers & Security* 73 (2018): 102-113.

⁴⁸¹ Huber et al, "Towards Automating Social Engineering."

⁴⁸² Lauinger et al, "Honeybot, Your Man in the Middle."

for ASE attacks, such as avoiding URLs from anonymous sources, refusing requests from unknown “friends,” and “making use of highly restrictive privacy settings.”⁴⁸³

Alongside the ascendant concern for automated social engineering, the algorithmic turn for media studies invokes the escalating importance of automated algorithmic processes for media production and consumption,⁴⁸⁴ shifting cultural paradigms brought about by an “algorithmic culture,”⁴⁸⁵ governance of online information and interactions undertaken by algorithmic processes,⁴⁸⁶ and the role of algorithms in subjectivity and identity formation.⁴⁸⁷ A recent substrate of critical algorithm studies foregrounds the

⁴⁸³ Kaul and Sharma, “Study of Automated Social Engineering,” 15.

⁴⁸⁴ Uricchio, William. “The algorithmic turn: Photosynth, augmented reality and the changing implications of the image.” *Visual Studies* 26, no. 1 (2011): 25-35; Napoli, Philip M. “Automated media: An institutional theory perspective on algorithmic media production and consumption.” *Communication Theory* 24, no. 3 (2014): 340-360; Napoli, Philip M. “On automation in media industries: Integrating algorithmic media production into media industries scholarship.” *Media Industries Journal* 1, no. 1 (2014); Kushner, Scott. “The freelance translation machine: Algorithmic culture and the invisible industry.” *New Media & Society* 15, no. 8 (2013): 1241-1258.

⁴⁸⁵ Roberge, Jonathan, and Louis Melançon. “Being the King Kong of algorithmic culture is a tough job after all: Google’s regimes of justification and the meanings of Glass.” *Convergence* 23, no. 3 (2017): 306-324; Galloway, Alexander R. *Gaming: Essays on algorithmic culture*. U of Minnesota Press, 2006; Striphas, Ted. “Algorithmic culture.” *European Journal of Cultural Studies* 18, no. 4-5 (2015): 395-412; Hallinan, Blake, and Ted Striphas. “Recommended for you: The Netflix Prize and the production of algorithmic culture.” *New Media & Society* 18, no. 1 (2016): 117-137; Dourish, Paul. “Algorithms and their others: Algorithmic culture in context.” *Big Data & Society* 3, no. 2 (2016): 2053951716665128; Seyfert, Robert, and Jonathan Roberge, eds. *Algorithmic cultures: essays on meaning, performance and new technologies*. Vol. 189. Taylor & Francis, 2016.

⁴⁸⁶ Gillespie, Tarleton. “The relevance of algorithms.” *Media technologies: Essays on communication, materiality, and society* (2014): 167-194; Pariser, Eli. *The filter bubble: How the new personalized web is changing what we read and how we think*. Penguin, 2011; Massanari, Adrienne. “# Gamergate and The Fapping: How Reddit’s algorithm, governance, and culture support toxic technocultures.” *New Media & Society* 19, no. 3 (2017): 329-346; Just, Natascha, and Michael Latzer. “Governance by algorithms: reality construction by algorithmic selection on the Internet.” *Media, Culture & Society* 39, no. 2 (2017): 238-258; Uricchio, William. “Data, culture and the ambivalence of algorithms.” *The Datafied Society: Studying Culture through Data* (2017): 125-138; Gillespie, Tarleton. *Custodians of the Internet: Platforms, content moderation, and the hidden decisions that shape social media*. Yale University Press, 2018.

⁴⁸⁷ Cheney-Lippold, John. “A new algorithmic identity: Soft biopolitics and the modulation of control.” *Theory, Culture & Society* 28, no. 6 (2011): 164-181; Packer, Jeremy. “Homeland subjectivity: The algorithmic identity of security.” *Communication and Critical/Cultural Studies* 4, no. 2 (2007): 211-215; Karakayali, Nedim, Burc Kostem, and Idil Galip. “Recommendation Systems as Technologies of the Self: Algorithmic Control and the Formation of Music Taste.” *Theory, Culture & Society* (2017): 0263276417722391; Bishop, Sophie. “Anxiety, panic and self-optimization: Inequalities and the YouTube algorithm.” *Convergence* 24, no. 1 (2018): 69-84.

social and acts of sociality as increasingly susceptible to algorithmic logics, including social movements as shaped by algorithmically-mediated environments,⁴⁸⁸ algorithmic forms of sociality as destabilizing enduring conceptions of culture,⁴⁸⁹ and algorithmic quantification as prescribing sociality on Facebook.⁴⁹⁰ David Beer's consideration of the "social power of algorithms" (in a special issue of *Information, Communication and Society* edited by Beer and devoted to the same topic⁴⁹¹) invokes both the material technological affordances of algorithms and the way algorithms function as immaterial imaginaries for envisioning and seeing the world.⁴⁹²

Contemplating the automation of the social leads many scholars to analyze the role of automated bots among social media and other forums for connected sociality. Among journalism scholars, the turn towards (ro)bot journalism considers the increasing implications of bots for automated dispersion of news on Twitter,⁴⁹³ issues of authorship and journalistic credentials,⁴⁹⁴ and larger implications for the survival of human journalism.⁴⁹⁵ Media studies and communication scholarship increasingly focuses on a more specific type of automated bot – socialbots. As the name suggests, a socialbot is an automated software agent that mimics human interactive behavior on social media and, in doing so, often convinc-

⁴⁸⁸ Milan, Stefania. 2015. "When Algorithms Shape Collective Action: Social Media and the Dynamics of Cloud Protesting." *Social Media & Society* 1 (2). <http://sms.sagepub.com/content/1/2/2056305115622481.full>;

⁴⁸⁹ Wilf, Eitan. 2013. "Toward an Anthropology of Computer-Mediated, Algorithmic Forms of Sociality." *Current Anthropology* 54(6): 716-739. <http://pluto.mscc.huji.ac.il/~ewilf/Wilf%20-%20Current%20Anthropology.pdf>

⁴⁹⁰ Grosser, Benjamin. 2014. "What Do Metrics Want? How Quantification Prescribes Social Interaction on Facebook." *Computational Culture*. <http://computationalculture.net/article/what-do-metrics-want>

⁴⁹¹ David Beer ed., "The Social Power of Algorithms." Special issue, *Information, Communication & Society* 20, no. 1 (2017).

⁴⁹² David Beer, "The Social Power of Algorithms," *Information, Communication & Society* 20, no 1 (2017): 1-13.

⁴⁹³ Lokot, Tetyana, and Nicholas Diakopoulos. "News Bots: Automating news and information dissemination on Twitter." *Digital Journalism* 4, no. 6 (2016): 682-699.

⁴⁹⁴ Montal, Tal, and Zvi Reich. "I, Robot. You, Journalist. Who is the Author? Authorship, bylines and full disclosure in automated journalism." *Digital Journalism* 5, no. 7 (2017): 829-849.

⁴⁹⁵ Latar, Noam Lemelshtrich. *Robot Journalism: Can Human Journalism Survive?* World Scientific, 2018.

ingly passes as a human being. In addition to studies examining the design, production, and human control of socialbots,⁴⁹⁶ Robert Gehl, Samuel Woolley, and Philip N. Howard published considerable research on socialbots in a relatively short period of time. Gehl's 2014 book *Reverse Engineering Social Media: Software, Culture, and Political Economy in New Media Capitalism* conceives of socialbots as technologies of "noo-power" (cognitive attributes as the means and loci for the exertion of power) capable of passing a "socialbot Turing test" by exerting noo-power to convincingly be received as human beings on social media.⁴⁹⁷ His co-editorship (alongside co-editor Maria Bakardjieva) of the 2016 collection *Socialbots and Their Friends: Digital Media and the Automation of Sociality* adds many worthwhile contributions to the study of socialbots specifically and automated sociality more generally.^{498,499} Both separately and collaboratively, Samuel Woolley and Philip N. Howard's recent work on bots as socio-political actors invokes the importance of bots in both civic politics and politics as a construct of social power. Together, Howard and Woolley are respectively principal investigator and an affiliated researcher for The Computational Propaganda Project – Algorithms, Automation and Digital Politics, a cross-disciplinary collaborative research program focused on interactivity among automated technique and politics, including streams dedicated to bots as propagandistic actors and the production and detection of

⁴⁹⁶ Bakardjieva, Maria. "Rationalizing sociality: an unfinished script for socialbots." *The Information Society* 31, no. 3 (2015): 244-256; Grimme, Christian, Mike Preuss, Lena Adam, and Heike Trautmann. "Social Bots: Human-Like by Means of Human Control?" *Big Data* 5, no. 4 (2017): 279-293.

⁴⁹⁷ Gehl, Robert W. *Reverse engineering social media: Software, culture, and political economy in new media capitalism*. Temple University Press, 2014.

⁴⁹⁸ Gehl, Robert W., and Maria Bakardjieva, eds. *Socialbots and their friends: Digital media and the automation of sociality*. Taylor & Francis, 2016.

⁴⁹⁹ Contributions include: Massanari, Adrienne L. "Contested play: The culture and politics of reddit bots." In *Socialbots and Their Friends*, pp. 126-143. Routledge, 2016; Rodley, Chris, and Grant Bollmer. "Speculations on the Sociality of Socialbots." In *Socialbots and Their Friends*, pp. 163-179. Routledge, 2016; Guzman, Andrea L. "Making AI safe for humans: A conversation with Siri." In *Socialbots and Their Friends*, pp. 85-101. Routledge, 2016; Graham, Timothy, and Robert Ackland. "Do Socialbots Dream of Popping the Filter Bubble? The Role of Socialbots in promoting Deliberative Democracy in Social Media." In *Socialbots and Their Friends: Digital Media and the Automation of Sociality*, pp. 187-206. Routledge, 2016.

bots.⁵⁰⁰ Thus far, their collaborative outputs include essays on bots and political communication during the 2016 U.S. presidential election⁵⁰¹ and co-editorship of a special section of the *International Journal of Communication* dedicated to the topics and themes of the Computational Propaganda Project.^{502,503} Apart from Howard, Woolley's work on socialbots includes proposing a political economy framework for researching bots and "social automation,"⁵⁰⁴ and the "automating power" of socialbots incepting into global politics.⁵⁰⁵

5.2 From Social Automation to Autonomy of the Social

I share with these aforementioned scholars and strands of literature a concern for the relationship between automation and the social, and more specifically, autonomy as a political power struggle in digital economies. While social automation research adds considerable insights to the deleterious implications of automation on social life and actors, automated sociality often manifests in ways alternately

⁵⁰⁰ "About" The Computational Propaganda Project, <http://comprop.oii.ox.ac.uk/about-the-project/>.

⁵⁰¹ Howard, Philip N., Bence Kollanyi, and Samuel Woolley. "Bots and Automation over Twitter during the US Election." *Computational Propaganda Project: Working Paper Series* (2016); Howard, Philip N., Samuel Woolley, and Ryan Calo. "Algorithms, bots, and political communication in the US 2016 election: The challenge of automated political communication for election law and administration." *Journal of Information Technology & Politics* (2018): 1-13.

⁵⁰² Samuel C. Woolley and Philip N. Howard eds., "Automation, Algorithms, and Politics." Special section, *International Journal of Communication* 10 (2016).

⁵⁰³ Essays in this special section include: Neff, Gina, and Peter Nagy. "Automation, algorithms, and politics| talking to Bots: Symbiotic agency and the case of Tay." *International Journal of Communication* 10 (2016): 4915 – 4931; Murthy, Dhiraj, Alison B. Powell, Ramine Tinati, Nick Anstead, Leslie Carr, Susan J. Halford, and Mark Weal. "Automation, algorithms, and politics| Bots and political influence: a sociotechnical investigation of social network capital." *International Journal of Communication* 10 (2016): 4952 – 4971; Kollanyi, Bence. "Automation, Algorithms, and Politics| Where Do Bots Come From? An Analysis of Bot Codes Shared on GitHub." *International Journal of Communication* 10 (2016): 4932 – 4951; Maréchal, Nathalie. "Automation, algorithms, and politics| When bots tweet: Toward a normative framework for bots on social networking sites (feature)." *International Journal of Communication* 10 (2016): 5022 - 5031.

⁵⁰⁴ Woolley, Samuel. "The Political Economy of Bots: Theory and Method in the Study of Social Automation." In *The Political Economy of Robots*, pp. 127-155. Palgrave Macmillan, Cham, 2018.

⁵⁰⁵ Woolley, Samuel C. "Automating power: Social bot interference in global politics." *First Monday* 21, no. 4 (2016).

(and even simultaneously) ennobling and disenchanting, especially as the digital gearwork of automation extracts, processes, and presents social information with an impenetrable opacity. On Facebook, for example, users might recognize the ability to solidify bonds through automated suggestions to “tag” friends in photos, while also recognizing the troublesome aspects of surveillance and monetization undergirding this automation. Of course, the ability to recognize potential implications of automation is highly dependent on what can be recognized in the first place, as Facebook and other socially-connected platforms often obfuscate messy complications underpinning such systems via interfaces that downplay such complications by presenting social information as intuitive, usable, and engaging. In order to more precisely account for such complications, I shift the focus from social automation to autonomy as a social condition both impacted by automated sociality and looping back into techno-industrial methods for configuring automated social interactions.

A nuanced conception of autonomy adds insights unaddressed by social automation research, while also establishing connective tissue with such strands of research that can aid subsequent inquiries. In the case of Uber, the company’s recent efforts to obtain legal protections for a process that automates social media information to connect riders with idealized counterparts is a fruitful locus for conceptualizing notions of autonomy built into intertwined legal, technological, and economic paradigms. Moreover, the privilege Uber gives to its application interface in patent documentation offers insights into how autonomy can be conceptualized when the social is embedded into automated techniques that push certain social configurations towards the interface and pull others from view. This is especially critical since, as I will demonstrate, Uber’s interface is an *iconic interface* that allegorizes a dilemma for contemporary civic democracy – achieving and maintaining a personal autonomy conceived as a determinative force for social cohesion. [Before initiating my analysis, however, it’s important to media studies analyses of Uber and the company’s economic, legal, and social significance, especially as the company rapidly became a figurehead for intensifying conditions of contemporary capitalist logics alternately designated as

“sharing economies” “platform capitalism,” and other manifestations of digital capitalism. Thus, the following section will clarify how this chapter not only intervenes with social automation literatures, but also enmeshed scholarly concerns for Uber, digital economies, and mediating technologies.

5.3 Uber and the Industrial Logics of Platform Economies

Shortly after Uber’s public launch in 2011, the company quickly became embroiled in cultural conversations around its disruption⁵⁰⁶ of municipal transport services (often taxicabs), classification of - and responsibilities for - Uber drivers, the company’s attempts to thwart regulatory oversight, and safety concerns for both Uber riders and drivers. Scholarly literatures on Uber orbit around the company’s role in reconfiguring two overlapping dynamics: labor and digitally-mediated economies (i.e. sharing/gig/access/on-demand economies). With regard to labor, Uber’s business model is a driving force behind the move towards “platform labor,”⁵⁰⁷ “algorithmic labor,”⁵⁰⁸ and “splintering precarity.”⁵⁰⁹ In their nine-month empirical study of Uber drivers, Rosenblat and Stark describe Uber drivers as subject to a “regime of automated and algorithmic management,” an “algorithmic labor” predicated on Uber’s ability to use its mobile application to control drivers and therefore engender asymmetric power and economic relations between drivers and the company.⁵¹⁰ After conducting interviews with Uber and Lyft drivers, Malin

⁵⁰⁶ Laurell, Christofer, and Christian Sandström. "Analysing Uber in social media—disruptive technology or institutional disruption?" *International Journal of Innovation Management* 20, no. 05 (2016): 164001; Cramer, Judd, and Alan B. Krueger. "Disruptive change in the taxi business: The case of Uber." *American Economic Review* 106, no. 5 (2016): 177-82; Schneider, Allison. "Uber Takes the Passing Lane: Disruptive Competition and Taxi-Livery Service Regulations." *Elements* 11, no. 2 (2015).

⁵⁰⁷ van Doorn, Niels. "Platform labor: on the gendered and racialized exploitation of low-income service work in the ‘on-demand’ economy." *Information, Communication & Society* 20, no. 6 (2017): 898-914.

⁵⁰⁸ Rosenblat, Alex, and Luke Stark. "Algorithmic labor and information asymmetries: A case study of Uber’s drivers," *International Journal of Communication* 10 (2016): 3578 – 3784.

⁵⁰⁹ Malin, Brenton J., and Curry Chandler. "Free to work anxiously: Splintering precarity among drivers for Uber and Lyft." *Communication, Culture & Critique* 10, no. 2 (2017): 382-400.

⁵¹⁰ Alex Rosenblat and Luke Stark, “Algorithmic Labor and Information Asymmetries,” 3759.

and Chandler describe a “splintering precarity” that bifurcates between a driver’s precarity as an independent contractor and the “sense of autonomy and sociality” garnered from their working arrangement, a splinter between risks and rewards that can “offer cover for corporate exploitation and neoliberal privatization.”⁵¹¹ For van Doorn, Uber drivers are indicative of stratified “opportunities and vulnerabilities associated with digitally mediated service work,” a “platform labor” in which “inequality is a feature rather than a bug.”⁵¹² Under this schema, Uber functions as a “platform labor intermediary” that uses peer-to-peer networking to exploit the flexible, scalable, and fragmented nature of labor facilitated through such networking.⁵¹³ In addition to this study, “platform” is an orienting term for considering opportunities to harness economic and technological infrastructures of Uber-style post-Fordist capitalism for egalitarian ends, often in dialectic conversation with what Uber represents as a potential slippage into heightened economic and social inequality.

Trebor Scholz focuses on Uber as a company indicative of “platform capitalism” wherein the digital platform and its modes of datafied extraction, exchange, and control are central to the establishment of monopolistic firms increasingly dominating market sectors.⁵¹⁴ In this context, Uber is a “lean platform” that seeks to minimize owned assets and therefore “profit by reducing costs as much as possible.”⁵¹⁵ Douglas Rushkoff foregrounds the monopolistic aspirations of Uber’s “platform monopoly,” describing the company as indicative of Silicon Valley businesses to monopolize its sector not just by squeezing out competitors, but by becoming the sector itself.⁵¹⁶ In this vein, to be a platform is to be more than a company; it is to be the omnipresent force controlling an industrial environment, such as vehicular roadway transportation. Uber epitomizes this dynamic to such an extent that the term “Uberisation” (alternately:

⁵¹¹ Malin and Chandler, “Free to Work Anxiously,” 391; 384.

⁵¹² Van Doorn, “Platform Labor,” 898; 907

⁵¹³ *Ibid* 901.

⁵¹⁴ Srnicek, Nick. *Platform Capitalism*. John Wiley & Sons, 2017.

⁵¹⁵ *Ibid* 49-50.

⁵¹⁶ Rushkoff, Douglas. *Throwing rocks at the Google bus: how growth became the enemy of prosperity*. Penguin, 2016.

Uberization) is often used to describe the diffusion of business models based on using digital platforms to facilitate the exchange of resources not owned by the business.⁵¹⁷ Similarly, Gary Hall's *Uberfication of the University* (2016) situates Uber's techno-economic practices as a metaphor for the neoliberal sharing economy's "weakening of the social" and its implications for the potential of organized labor.⁵¹⁸ As indicated by Hall, critical analyses of Uber often bind with critiques of the techno-economic logics of the sharing economy and contemporary ideologies of "sharing" in general.⁵¹⁹ While critiques of Uber and its economic logics tend to indicate a regression from utopian possibilities of networked peer-to-peer "collective intelligence,"⁵²⁰ collaborative non-market "social production,"⁵²¹ heterarchical "produsage,"⁵²² and the emergence of a "participatory culture"⁵²³ imagined by cultural theorists, these critiques often leverage the utopian spirit of such paradigms to offer a dialectical counterpart to platform capitalism that envisions harnessing underlying technological and organizational infrastructural for egalitarian ends, often conceived as an opportunity for "platform cooperativism."

⁵¹⁷ See: Nurvala, Juha-Pekka. "Uberisation is the future of the digitalised labour market." *European View* 14, no. 2 (2015): 231-239; Davis, Gerald F. "What might replace the modern corporation: Uberization and the web page enterprise." *Seattle UL Rev.* 39 (2015): 501-515; Fleming, Peter. "The human capital hoax: Work, debt and insecurity in the era of Uberization." *Organization Studies* 38, no. 5 (2017): 691-709.

⁵¹⁸ Hall, Gary. *The Uberfication of the University*. Minneapolis: University of Minnesota Press (2016): 3.

⁵¹⁹ See: Van Dijck, José. *The culture of connectivity: A critical history of social media*. Oxford University Press, 2013; Slee, Tom. *What's yours is mine: Against the Sharing Economy*. Scribe Publications, 2017; Perzanowski, Aaron and Jason Schultz. *The End of Ownership: Personal Property in the Digital Economy*. MIT Press, 2016; John, Nicholas A. *The age of sharing*. John Wiley & Sons, 2017; Goldberg, Greg. *Antisocial Media: Anxious Labor in the Digital Economy*. NYU Press, 2018; Hamari, Juho, Mimmi Sjöklint, and Antti Ukkonen. "The sharing economy: Why people participate in collaborative consumption." *Journal of the Association for Information Science and Technology* 67, no. 9 (2016): 2047-2059.

⁵²⁰ Lévy, Pierre. *Collective Intelligence*. New York: Plenum/Harper Collins, 1997.

⁵²¹ Benkler, Yochai. *The Wealth of networks: How social production transforms markets and freedom*. Yale University Press, 2006.

⁵²² Bruns, Axel. *Blogs, Wikipedia, Second Life, and beyond: From production to produsage*. Peter Lang, 2008.

⁵²³ Jenkins, Henry. *Convergence culture: Where old and new media collide*. NYU Press, 2006; Jenkins, Henry. *Fans, bloggers, and gamers: Exploring participatory culture*. NYU Press, 2006; Jenkins, Henry. *Textual poachers: Television fans and participatory culture*. Routledge, 2012.

In much of his recent research on Uber and the platform economy, Scholz advocates for a “platform cooperativism” that seeks to usurp and alter sharing economy technologies, recalibrate capitalist modes of ownership and production into cooperative paradigms of solidarity, and generate egalitarian outcomes.⁵²⁴ As co-editor (alongside platform cooperative advocate Nathan Schneider⁵²⁵) of the collection *Ours to Hack and Own: The Rise of Platform Cooperatives* (2016), Scholz brings together various scholars, activists, journalists, and other writers eager to establish platform cooperatives (alternately: platform co-ops) based on mutual ownership, participation, and governance by those who contribute to the value and uses of outputs. In the introduction, Scholz suggests platform co-ops establish four pillars to uplift its egalitarian aims: communal design and ownership of technology, sufficient and steady income for its workers, rigorous understanding of norms and values of the communities it serves, and transparency of data flows.⁵²⁶ Scholz and Rushkoff (who also advocates for platform cooperativism⁵²⁷) are contributing researchers to the Platform Cooperativism Consortium, a collaboration dedicated to advancing cooperative platform paradigms through research, activism, education, and the application of other coordinated services (i.e. legal advice, software development).⁵²⁸ In this context, Uber represents an organizational and technological lattice work that serves as a functional model for building and sustaining modes of collaborative production and consumption antithetical to Uber’s platform capitalist logics. This move towards “digital commoning” has also very recently been critiqued and defended by

⁵²⁴ Scholz, *Uberworked and Underpaid*, 8-9.

⁵²⁵ Schneider, Nathan. "An internet of ownership: democratic design for the online economy." *The Sociological Review* 66, no. 2 (2018): 320-340.

⁵²⁶ Trebor Scholz, “How Platform Cooperativism Can Unleash the Network,” in Scholz and Schneider eds. *Ours to Hack and To Own: The Rise of Platform Cooperativism, A New Vision for the Future of Work and a Fairer Internet*, OR Books (2016): 25.

⁵²⁷ Rushkoff, *Throwing Rocks at the Google Bus*.

⁵²⁸ Platform Cooperative Consortium, <http://platformcoop.newschool.edu/>.

scholars concerned with organizational practice.⁵²⁹ If notions of a digital commons and communing practices are critical for platform cooperative advocates, social “commonality” is a key component of Uber’s attempts to secure legal footing for its ability to technologically facilitate social transactions and resources.

5.4 Uber: Patently Social

Uber’s Feb. 2017 patent application for social media integration seeks legal protection for a process that enables Uber’s mobile application to access social media information and leverage this information to establish a “common link” between potential Uber carpool riders.⁵³⁰ This patent proposes use this information to better match potential riders opting for UberPOOL, an Uber carpooling service that enables targeted matching and pooling of riders who can share the cost of the ride. Matching riders, in this sense, means establishing commonalities such as interests, affiliations, and other indicators of social status and participation. For Uber, the patent is a business maneuver intended to prevent competitors (such as Lyft) from utilizing similar methods to attract riders. In this sense, the patent application reflects the increasing turn for digital media and technologies companies to attain marketplace latitude by legally cordoning off products and services, particularly as two types of patents are increasingly pursued and granted: software patents and business method patents.

For media and technology industries, patents have long been critical components of establishing technological standards and institutional dominance, from Thomas Edison’s prolific pursuit of patents to control the design of film stock and cameras⁵³¹ to the Bell Company/AT&T’s use of patent litigation to

⁵²⁹ See: Ossewaarde, Marinus, and Wessel Reijers. "The illusion of the digital commons: 'False consciousness' in online alternative economies." *Organization* 24, no. 5 (2017): 609-628; Reijers, Wessel, and Marinus Ossewaarde. "Digital commoning and its challenges." *Organization* (2018): 1350508418757571; Kostakis, Vasilis. "In defense of digital commoning." *Organization* (2018): 1350508417749887.

⁵³⁰ Bijor, Rahul, Matthew Wyndowe, Zoran Martinovic, Dmitry Shevelenko, and Amritha Prasad. "Social media integration for transport arrangement service." U.S. Patent Application 15/221,933, filed February 2, 2017.

⁵³¹ See: Decherney, Peter. *Hollywood's copyright wars: From Edison to the internet*. Columbia University Press, 2012.

dominate telecommunications markets and ward off emerging entrants.⁵³² While intellectual property laws and effective oversight of potential violators has long entailed complications for industries and consumers alike, the emergence of the internet presented particular challenges for media companies whose business models depended on selling tangible goods (i.e. DVDs, CDs) or access to media content (movie theaters, cable television) that very quickly became digital bundles of data easily and efficiently extractable, replicable, shareable, and otherwise accessible among online denizens. Critical aspects of the digital turn for media studies includes assessing the social and cultural contexts of digital right management (DRM)⁵³³ and alternative models for intellectual property and copyright laws in a digitally-connected world, often conceived as overlapping rubrics of “copyleft,”⁵³⁴ remix culture,⁵³⁵ “free” culture,⁵³⁶ and open source.⁵³⁷ In addition to shaping bedrock technological devices and practices, patents were critical to transforming notions of “intellectual property” from a “metaphor and academic convention in the 1960s” to a material legal reality by the year 2000,⁵³⁸ a transformation galvanized by a 1980s patent office policy change that allowed the patenting of software, resulting in a 50 percent increase in patent

⁵³² See: Wu, Tim. *The master switch: The rise and fall of information empires*. Vintage, 2010.

⁵³³ Gillespie, Tarleton. *Wired shut: Copyright and the shape of digital culture*. Cambridge, MA: MIT press, 2007; Postigo, Hector. *The digital rights movement: The role of technology in subverting digital copyright*. MIT Press, 2012.

⁵³⁴ Berry, David M. *Copy, rip, burn: The politics of copyleft and open source*. Pluto Press, 2008; Söderberg, Johan. "Copyleft vs. copyright: A Marxist critique." *First Monday* 7, no. 3 (2002).

⁵³⁵ Lessig, Lawrence. *Remix: Making art and commerce thrive in the hybrid economy*. Penguin, 2008; Manovich, Lev. "What comes after remix." *Remix Theory* 10 (2007): 2013; Fagerjord, Anders. "After convergence: YouTube and remix culture." In *International handbook of internet research*, pp. 187-200. Springer, Dordrecht, 2009.

⁵³⁶ Lessig, Lawrence. *Free Culture: The Nature and Future of Creativity*. Penguin Books, 2004; Fitzgerald, Brian F., and Ian Oi. "Free culture: Cultivating the creative commons." *Media & Arts Law Review* 9, no. 2 (2004); Stallman, Richard. *Free software, free society: Selected essays of Richard M. Stallman*. Lulu. com, 2002; Kelty, Christopher M. *Two bits: The cultural significance of free software*. Duke University Press, 2008.

⁵³⁷ Coleman, Gabriella. "The political agnosticism of free and open source software and the inadvertent politics of contrast." *Anthropological Quarterly* 77, no. 3 (2004): 507-519; Coleman, Gabriella. "Code is speech: Legal tinkering, expertise, and protest among free and open source software developers." *Cultural Anthropology* 24, no. 3 (2009): 420-454; Ghosh, Rishab. *CODE: Collaborative ownership and the digital economy*. Mit Press, 2006.

⁵³⁸ Vaidhyanathan, Siva. *Copyrights and copywrongs: The rise of intellectual property and how it threatens creativity*. NYU Press (2003): 153.

litigation during this timeframe.⁵³⁹ Up to and beyond the year 2000, “software has increasingly become the subject of patent rights,”⁵⁴⁰ especially as software patents assume the form of a particular type of patent that secures legal rights for a software as a process rather than an object: business methods patents.

Business methods patents, as the name suggests, is a type of patent that enables a company to receive legal protection for what a technology can do rather than the technology itself. In his analysis of the increasingly intertwined relationship between business method patents and software patents, Jeremy Wade Morris describes both types of patents as “non-practical entities,” for the impractical way they attempt to “make digital content and goods behave more like their analog predecessors, while at the same time extending new means of control over certain types of media and forms of consumption.”⁵⁴¹ Morris cites the notable example of Amazon’s patenting of “1-Click” shopping that stores customer information for the purpose of enabling customers to purchase goods in a single click, as well as Amazon’s subsequent lawsuit against rival bookseller Barnes & Noble on the grounds that the latter company’s “Express Lane” option infringed on Amazon’s 1-Click patent.⁵⁴² Where this lawsuit is indicative of the legal and monetary importance of patents, Google’s recent litigation against Uber’s alleged patent infringement of autonomous vehicle technology further stresses the critical nature of patent protections.

In February 2017, autonomous car company Waymo (sister company of Google within the Alphabet Inc conglomerate) accused former engineer Anthony Levandowski⁵⁴³ of procuring proprietary

⁵³⁹ Boyle, James. *Shamans, software, and spleens*. Harvard University Press (1996): 132-133.

⁵⁴⁰ Benkler, *The Wealth of Networks*, 437.

⁵⁴¹ Morris, Jeremy Wade. "Non-Practical Entities: Business Method Patents and the Digitization of Culture." *Critical Studies in Media Communication* 31, no. 3 (2014): 224.

⁵⁴² *Ibid* 215-216.

⁵⁴³ Levandowski, despite being unnamed as a defendant in the lawsuit, refused to cooperate in an internal Uber investigation, resulting in his termination from the company in May 2017, shortly before Levandowski again pivoted towards another venture – the Way of the Future (WOTF), a church dedicated to realizing an artificial intelligence Godhead. See: <http://www.wayofthefuture.church/>.

Waymo trade secrets (such as blueprints and design specifications for autonomous driving technology) that remained in his possession when he left the company in early 2016 to found Otto, an autonomous trucking company acquired by Uber in August 2016. When Waymo filed suit against Uber in Feb. 2017, patent infringement was chief among the complaints, as Waymo alleged Uber's LiDAR (light detection and ranging) system infringes on multiple patents awarded to Waymo.⁵⁴⁴ One year later, in Feb. 2018, the lawsuit ended in a settlement, as Uber legally agreed to refrain from using Waymo intellectual property and transfer company equity valued at approximately \$245 million.⁵⁴⁵ In addition to this incident, Uber's attempt to patent "Surge Pricing,"⁵⁴⁶ - a practice of inflating rates during periods of high demand that has been subject to no shortage of cultural controversies⁵⁴⁷ - is a means of "patenting price gouging,"⁵⁴⁸ as Uber's price surges positively correlate with ridesharing as a source of consumer necessity and/or desperation.

As indicated by these situations, patents are a critical locus for conceptualizing legal, economic, and political entanglements shaping motivations of digital media companies and ensuing implications for the social, including social possibilities for consuming goods online (1-Click) or hailing an autonomous

⁵⁴⁴ "Waymo LLC v. Uber Technologies, Inc. et al," Feb. 23, 2017, <https://www.tradesecretsinsider.com/wp-content/uploads/sites/323/2017/03/Waymo-LLC-v.-Uber-Technologies-Inc.-et-al..pdf>.

⁵⁴⁵ Selana Larson, "Uber and Waymo Settle Trade Secrets Lawsuit," *CNN*, Feb. 2018, <http://money.cnn.com/2018/02/09/technology/uber-waymo-settlement/index.html>.

⁵⁴⁶ Novak, Kevin Mark, and Travis Cordell Kalanick. "System and method for dynamically adjusting prices for services." U.S. Patent Application 13/828,481, filed September 19, 2013.

⁵⁴⁷ One the most notorious incidents is the Jan. 2017 #DeleteUber social media campaign that stemmed from Uber disabling Surge Pricing amidst a taxi drivers' strike at New York's John F. Kennedy airport. The strike was a protest against President Trump's executive order on immigration from select Middle Eastern countries. Critics charged Uber with profiting from the strike by dropping Surge Pricing as a promotional tactic, leading to an estimated loss of 200,000 Uber users. See: Faiz Siddiqui, "#DeleteUber Will Have Lasting Fallout for Ride-Hailing App, Study Says," *The Washington Post*, May 16 2017, https://www.washingtonpost.com/news/dr-grid-lock/wp/2017/05/16/deleteuber-will-have-lasting-fallout-for-ride-hailing-app-study-says/?utm_term=.16e09d13a4b5.

⁵⁴⁸ George H. Pink, "Legal Issues: Patenting Price Gouging," *Information Today* 32 no 2, 2015, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2963280.

ridesharing vehicle in the near future (Waymo). As previously indicated, the Uber social media integration patent offers critical insights into alternating autonomous possibilities for social actors when the social field is subsumed into a proposed ownership model for automating the extraction and configuration of social interactions. In other words, where 1-Click patenting and litigation impacts social uses, the Uber patent is comprised of social interactions, warranting a precise consideration of how an intensified automation of the social alternately imbues autonomous potential for those whose interactions are fed into and impacted by such processes. My method of analysis, however, also conceives of the Uber patent as a rich visual element, as its textual content includes both typographical writing and graphical pictorial elements that seek to describe, contextualize and imagine the uses for its proposed software methods, including the way infographic visuals depict social commonalities amidst software processes invisible to those who will ultimately use the Uber application. Thus, in the next section, my methodology describes the importance of visibility and visual rhetoric to imaginaries of autonomy emerging from this patent and the ways its visual elements indicate complications of autonomy corresponding with struggles for maximizing social solidarity.

5.5 Methodology: Discursive and Visual Nodes

As with other chapters, my approach conceives of the Uber patent application as a significant “nodal point” among Uber’s attempts to foster and calibrate social interactors that signify for riders the superiority of Uber services. A nodal point, as described by Laclau and Moueffe, is a privileged site among a broader network of discursive formations.⁵⁴⁹ Unlike previous chapters, I invest greater analytical significance in this singular object, as this application is not only a nodal point among discursive arenas, it is also a nodal point among a discursive network interior to this object, a nodal point among Uber’s visualization of invisible processes for embedding, extracting, and reconfiguring the social and

⁵⁴⁹ Ernesto Laclau, and Chantal Mouffe, *Hegemony and Socialist strategy: Towards a Radical Democratic Politics*, (Verso Books, 1985): 112.

the visibility of this imagined sociality via the Uber interface. In accounting for the method at the heart of Uber's attempt to secure ownership of this business method, Uber leverages descriptive typographical discourse alongside pictorial and infographical visualizations, alternately describing and depicting unseen backend technological machinations and the manifestation of visible social forms via the Uber application interface. Thus, as previously indicated, the interface is central to my argument about notions of autonomy built into and emanating from Uber's pursuits for the intensification of automated sociality.

My concern for the interface entails both *the* interface as a material object (the graphical user interface) and interface as a process of interactivity (interfacing with Uber, its application, and other riders). To enliven the relation between the patent application, the Uber interface, and autonomy, I leverage conceptual studies of the interface from digital media theory and visual rhetoric. Likewise, from visual rhetoric I leverage strands of scholarship concerned with relationships among envisioning and imagining socio-political potentials, graphic visual objects freighted with orientations for such envisioning, and, most critically, the iconicity of the Uber graphical user interface. Following from this, my analysis first accounts for the Uber interface as an iconic interface and, following from this, stresses autonomy as a condition subject to iconic interfacial simplicity, complexity, (in)visibility, and abstraction, aspects of the Uber iconic interface that extend to underlying economic, legal, and technological conditions informing Uber's motivations and circumstances of digital capitalism more generally.

5.6 Uber: The Iconic Interface

As a means of presenting its proposed methods for patent officials, the Uber social media integration (SMI) patent application begins in a manner consistent with Uber's consumer-facing presentation of its service: foregrounding snapshots of the Uber interface. The first page of the application features req-

uisite classification information, an abstract, and two diagrammed layouts of the Uber interface, not unlike the sequence of interface snapshots that appear as headers on the iTunes⁵⁵⁰ and Google Play⁵⁵¹ stores. The patent snapshots provide diagrammatic indicators for the wholistic GUI and constituent features such as header bar, location window, location pin, pick-up location, selected driver, and ETA indicator. A few pages later, these same snapshots are the sole content of an entire page (labeled as FIG. 4A and FIG. 4B), followed with a single snapshot of the Uber interface (FIG. 4C) that diagrams how automated social media information will manifest as visual forms on the GUI. In this imagined scenario, a box at mid-screen asks users “Connect With a Rider A on Facebook?” while a notification that overlaps the location window implores this connection based on a shared collegiate affiliation: “You and Rider A both graduated from Boise State!”⁵⁵² These forms manifest as visual elements with shapes, contours, and pictorial dimension similar to other types of notifications and imbedded features (i.e. payment method windows, type of Uber service), in addition to retaining underlying visual features persistent across all iterations of the Uber interface and its representations, elements that grant iconic status to the Uber interface.

An icon is a mode of symbolic representation that coheres meaning through such representation. Religious icons are fruitful examples. For many Buddhists, a mandala represents both the totality of the cosmos and the interiority of the self, serving as a coherent point of reflection for their shared ontological significance. For most Christians, the crucifix is an icon that represents the event of Jesus Christ’s crucifixion, Jesus Christ divinity and transubstantiation, doctrines of faith and spirituality informing Christian practice, and social affiliation with Christian belonging, among other attributes. As this example indi-

⁵⁵⁰ “Uber,” <https://itunes.apple.com/us/app/uber/id368677368?platform=iphone&preserveScrollPosition=true#platform/iphone>.

⁵⁵¹ “Uber,” https://play.google.com/store/apps/details?id=com.ubercab&hl=en_US.

⁵⁵² Bijor et al, “Social Media Integration.”

cates, icons are highly associated with visual representations, such as the geometric patterns of the crucifix and mandala. An icon is therefore a “rhetoric of legitimate representation” that gives voice to unseen elements through widely-recognized modes of identification.⁵⁵³ Beyond enduring religious iconography, the turn towards the visual for rhetorical studies increasingly illuminates the iconicity of 20th and 21st century photographs, imagery, and pictorial configurations, analyses that inform the conceptualization of the Uber interface as iconic, alongside implications for iconicity and socio-political life.

In their study of iconic 20th century photographs, Hariman and Lucaites cite widespread recognition, reproduction, and social identification as pivotal attributes for iconicity, qualities that endure across pictorial depictions “structured by familiar patterns of artistic design,” what they refer to as “aesthetic familiarity.”⁵⁵⁴ As a productive example, they cite the famous photograph “V—J Day in Times Square” (also known as the Times Square kiss photo) that depicts a U.S. Navy sailor kissing a woman in Times Square on August 14, 1945, the day of Japan’s World War II surrender to the U.S. Beyond the historical reproduction and continual recognition of the image itself, the photo’s compositional elements – the sailor’s arms clasped to the woman’s waist and hooked around the upper part of her back; the woman arching her body backwards amidst the overbearing posture of the sailor’s embrace; the woman’s right leg bent at the knee in a 120-degree angle; their place in the center of the frame; the medium-wide distance from the camera; and the throng of onlookers infusing the photographic field behind the kissing twosome - constitute an aesthetic familiarity that enables pastiches, parodies, copies, tributes, and other facsimiles to signify the original image and what it connotes in terms of public social life. For Hariman and Lucaites, a *New Yorker* cartoon cover that depicts two men kissing challenges the “national heterosexuality” of the original photo, as the drawn cartoon depicts the men in clothing,

⁵⁵³ O’Gorman, Ned. *The Iconoclastic Imagination: Image, Catastrophe, and Economy in America from the Kennedy Assassination to September 11*. University of Chicago Press (2015): 49.

⁵⁵⁴ Hariman, Robert, and John Louis Lucaites. *No caption needed: Iconic photographs, public culture, and liberal democracy*. University of Chicago Press (2007): 29.

poses, bodily gestures, and compositional arrangements that confronts heteronormative assumptions about citizenship by leveraging the aesthetically-familiar signifiers of the classically iconic image. The ability to both signify and challenge national heterosexuality emanates from the “reproduction of the iconic template within a different context and from variation on the composition itself.”⁵⁵⁵ An iconic template therefore structures aesthetic familiarity to such a heightened degree that subsequent variations and transformations maintain recognizability and identifiability, even amidst shifting aesthetic representations. As evidenced by the reproduction and circulation of the Uber interface across technological, consumptive, and legal paradigms, the Uber interface is a type of iconic template, an iconic interface signifying implications for the social life it embeds.

Whether appearing as screenshots on Google Play or Apple download pages, the patent application, or online news stories, as well as the tangible screen used by Uber riders when hailing a ride, the Uber interface retains an aesthetic familiarity regardless of device, operating system, or venue for pictorial representation (patent application, news story). A locative map of the rider’s geographical location constitutes the GUI imagery that persists even as visual aspects of the map shift in accordance with geo-location and alerts, notifications, and interactive nodes overlay the map. While the map disappears once the ride is over, the visual parameters of the map, overlays and segmentations with other visual forms (i.e. selecting ride service, driver status notification), and the procession of the interface’s visual forms maintain their consistency across software, hardware, materiality, immateriality and third-party affiliation. When the patent application outlines the visual dimensions of new features stemming from social media integration, the map persists as these new features (i.e. invitation to connect with a Facebook user) manifest in quadrants of the interface that approximate the appearance of familiar features (location window, pinned pickup location). Likewise, when Uber revamped its GUI in Nov. 2016, trade press noted the desire to streamline the interface’s functionality and graphical appeal by incorporating new

⁵⁵⁵ Ibid 78.

features and details that meshed well with the “familiar map interface.”⁵⁵⁶ Writeups on the overhaul also tended to include sequential layouts and animated gifs of the new interface in action, as well as concept designs that depict the familiar map interface sketched out in every screen iteration of pre-release redesign concepts.⁵⁵⁷

Thus, the Uber interface is widely recognizable,⁵⁵⁸ remains recognizable when reproduced across contexts (hardware, software, trade press), and fosters forms of social identification across lines of public life (rider, driver) and social status (opting for UberBlack’s luxury sedans). In other words, the Uber interface functions as an iconic template with an aesthetic familiarity that maintains even as the interface permeates variable technological configurations and Uber’s reconceptualization of visually-materialized interactivity. This is not to say that the Uber interface is iconic in the same way the mandala, crucifix, and V-J Day in Times Square photo are iconic. Given the very recent inception of Uber into the cultural landscape (2011), Uber’s dearth of temporal presence in collective social experiences and imagination belies the historical longevity of these aforementioned icons and their representative capacities. Instead, the iconicity of the Uber interface orients less towards the long march of history and more towards the accelerated temporal rhythms of a contemporary on-demand culture that enables more prolific and efficient participation in the reproduction, alteration, and circulation of visual imagery. Even among imagery with a very short lifespan, an iconic template can quickly form and foment widespread recognition and identification. Online memes are a notable example. As Stefka Hristova notes, online memes cohere meaning through vast circulation, recognition of identifiable meaning, and the concomi-

⁵⁵⁶ Lauren Goode, “Uber Just Streamlined the Hell Out of its App,” *The Verge*, Nov. 2, 2016, <https://www.theverge.com/2016/11/2/13490142/uber-app-redesign-streamline-shortcut-snapchat-filter>.

⁵⁵⁷ Patrick Faller, “More Features, Simple User Interface: Insights from Uber’s Design Director Didier Hilhorst,” *Abode Blog*, MMay 4, 2017, <https://theblog.adobe.com/more-features-simple-user-interface-insights-from-ubers-design-director-didier-hilhorst/>.

⁵⁵⁸ As further evidence, the Google Play and Apple download pages both include approximately 4.7 million user reviews.

tant ability to maintain meaning amidst alterations to visual forms, becoming "democratic in their widespread use and mutation as they survive and grow through participation" while remaining "structurally autocratic in their conservation of a key idea."⁵⁵⁹ In her advocacy for "iconographic tracking" as a methodological framework for studying the online circulation of iconic imagery, Laurie Gries accounts for the iconicity of the Obama "Hope" poster and its profuse memetic iterations, citing multiplicity and variation as galvanizing forces "capable of catalyzing change and producing space (and time) but also readily recognized and culturally and/or politically significant to a wide cultural group," aligning with Hariman and Lucaites' criteria of widespread recognition, identification, and political implications, despite differing magnitudes of historical significance.⁵⁶⁰

It's important to note that I do not claim that the Uber interface is unique in its iconic status among GUIs and interfacial elements, as other interfaces and the material domains they inhabit can embody such status, as in the case of the Apple iPod. Following from Apple's 2005 description of its iPod interface as the iconic aspect of the product, Michael Bull describes the iPod's "perfect marriage between aesthetic and functionality" as the quality that makes it the 21st century's "first cultural consumer icon,"⁵⁶¹ while David Beer conceives of the iPod interface as possessed with a "particular iconic status" revealing material and connective shifts for the music industry and "aesthetics and design of the digital age" more generally.⁵⁶² Similarly, the iPod's iconicity is recognized as owing to its hybrid ability to connote recognizable quotidian practices (listening to songs individually or sharing songs through Genius) and material interoperability (earphones, mp3 integration).⁵⁶³ The iPod can even attain a "cult value," an

⁵⁵⁹ Hristova, Stefka. "Visual Memes as Neutralizers of Political Dissent." *tripleC: Communication, Capitalism & Critique. Open Access Journal for a Global Sustainable Information Society* 12.1 (2014): 266.

⁵⁶⁰ Gries, Laurie. *Still life with rhetoric: A new materialist approach for visual rhetorics*. University Press of Colorado (2015): 110.

⁵⁶¹ Bull, Michael. "Iconic designs: the Apple iPod." *The Senses and Society* 1, no. 1 (2006): 105.

⁵⁶² Beer, David. "The iconic interface and the veneer of simplicity: MP3 players and the reconfiguration of music collecting and reproduction practices in the digital age." *Information, Community & Society* 11, no. 1 (2008): 83.

⁵⁶³ Nowak, Raphaël. "The multiplicity of iPod cultures in everyday life: uncovering the performative hybridity of the iconic object." *Journal for Cultural Research* 20, no. 2 (2016): 189-203.

iCon that bestows the exaltation of a user's immersive experience onto the iPod as a commodity and Apple as its corporate creator.⁵⁶⁴ My concern with Uber's iconic interface regards the incorporation of social life into a systemic means of imagining and visualizing social interactions and possibilities for social autonomy when such interactions are cast into iconic molds. As a loci for elements both seen and unseen, masked and revealed, visible and invisible, the iconic Uber interface allegorizes a dilemma of social life that seeks to maximize personal autonomy with collective governance, a dilemma further complicated by the motivations of presiding power constructs working to determine what can be seen, imagined, potentialized, and realized. Having established the Uber interface as an iconic interface and the stakes of this conception, I turn now to unpack the relationship between ideologies of interfacial "simplicity" and the autonomy of social actors in the context of such simplicity.

5.7 Uber: Autonomous Simplicity and Complexity

When accounting for the benefits Uber riders will receive from social media integration, the SMI patent application describes a "technical effect of improving user and driver access and social connectivity."⁵⁶⁵ The snapshots of the Uber interface indicate a concerted effort to ensure this "technical effect" is not only the resulting social interactions, but the effect of experiencing the GUI itself as "simplicity" and easy-to-use. Alongside the launch of the overhauled Uber application in Nov. 2016, Uber released a case study of the redesign process that stresses Uber's commitment to its "original promise" - "push a button, get a ride," an "original simplicity" that sought to retain the app's iconic template while streamlining visual interactive nodes within this template.⁵⁶⁶ In other words, the redesign sought greater simplicity through visual efficiency. Although most digital media companies strive for clarity and usability in GUI

⁵⁶⁴ Jenkins, Eric. "My iPod, my iCon: How and why do images become icons?." *Critical Studies in Media Communication* 25, no. 5 (2008): 466-489.

⁵⁶⁵ Bijor et al, "Social Media Integration."

⁵⁶⁶ "The Next Uber App – Where To Next?" Nov. 2016, <https://www.uber.design/case-studies/the-new-uber-app>.

design, Uber's foregrounding of GUI simplicity as an enduring corporate goal invokes ideologies of "simplicity" as obfuscating underlying complexities, especially when such complexities include the envelopment of the social field.

As an iconic interface, the Uber GUI is a "veneer of simplicity" that conceals "a vast complex, and enmeshed array of cultural and technological appropriations," including Uber's appropriation of social actors, information, and interactions.⁵⁶⁷ This veneer of simplicity masks two critical intertwined complexities. First, it concomitantly masks a users' ability to see the larger social field, the place they embody in relation to others, and pathways for forging complex forms of social solidarity that belie the simplicity of Uber's preferred social aggregations. Second, guided by an ethos of "reimagining how things flow,"⁵⁶⁸ Uber's foregrounding of user simplicity masks Uber's *economic simplicity*, the ease with which the Uber GUI subsumes social media information and transforms this information into potentialized economic gain. Where an iconic interface serves as an efficient locus for the "incorporation of information into the flows of everyday life,"⁵⁶⁹ Uber's iconic interface incorporates social media flows into unseen complexities expropriating and assembling social information for incorporation into Uber's idealized flow of everyday encounters with other Uber riders. If, as Jose van Dijck notes, sharing on social media enables users to accumulate social capital while the owners of social media platforms accumulate economic capital,⁵⁷⁰ Uber's envelopment of social media information sweeps this social capital into economic flows obscured by its ideology of simplicity and renders visible the reification of social capital into economic capital. When tantalized with the prospect of connecting with a fellow Boise State alumnus, an Uber user confronts her own reified social capital wrapped in an aura of simplicity, a tactic that also

⁵⁶⁷ Beer, "The Iconic Interface," 80.

⁵⁶⁸ "The Next Uber App."

⁵⁶⁹ Beer, "The Iconic Interface," 80.

⁵⁷⁰ Van Dijck, José. *The Culture of Connectivity: A Critical History of Social Media*. Oxford University Press (2013): 16.

implicitly suggests a potential rider close the loop by affirming matched ridesharing options subsequently fed back into underlying invisible complexities. Nonetheless, overinvestment of simplicity also enables users to bear witness to the visibility of underlying economic and legal complexities.

In their monograph on digital design, Bolter and Gromala align *simplicity* with *transparency*, accounting for a belief among GUI designers that interfaces must enable users to directly manipulate and interact with digital objects and environments, just as humans were presumed to interact with the natural world before it became animated by technological mediation.⁵⁷¹ This “myth of the natural interface” (one aspect of a broader “myth of transparency in digital design”) thus fosters the belief that interfaces should be transparent, in that users should *see through* the interface, as if it were a *window*, rather than *seeing the interface itself*, as if it were a *mirror*. While Bolter and Gromala de-privilege the transparent window metaphor on the grounds that interfaces must often reflect (mirror) their critical uses by calling attention to the interface (such as the way airplane flight control interfaces reflect the needs of pilots), Anne Friedberg punctures underlying assumptions about transparency itself, noting interaction with a computer interface is “mediated to a high degree through its proprietary or trademarked ‘software’” and therefore rarely offers direct “natural” viewing of its visual field, a quality enmeshed with the “highly iconic” nature of its visual representation.⁵⁷² The significance of these accountings is that ideologies of simplicity are not only faulty from the perspective of design and interactive practice but, more importantly, overreliance on simplicity pulls into view the very things it otherwise obscures. As Friedberg notes, the iconic interface’s simplicity presumes a transparency that is never fully attainable, as an interface mediates among legal, economic, and social informants built into the design of interfaces and underlying technological processes. In other words, simplicity entails more than just ease of technological

⁵⁷¹ Bolter, Jay David, and Diane Gromala. *Windows and mirrors: Interaction design, digital art, and the myth of transparency*. MIT Press (2003): 50.

⁵⁷² Friedberg, Anne. *The Virtual Window: From Alberti to Microsoft*. Cambridge, MA: MIT Press (2006): 231.

usage. Simplicity enables Uber to reify social capital into economic capital. Simplicity also serves a revelatory function, as this process can become transparent when Uber's iconic interface reflects back to users the fruits of their own social interactivity and users reflect on what this portends beyond consumeristic convenience.

In this way, iconic dimensions of Uber's interface manifest automated forms of sociality with two contrasting possibilities for autonomy. On the one hand, Uber's veneer of simplicity disables modes of envisioning the social and one's place in relation to other social actors, offsetting the ability for to see shared circumstances and strive for social solidarity based on such circumstances. If, as intoned by Scholz and Rushkoff, Uber's infrastructure offers the possibility for a move towards either platform cooperativism or platform monopolies, the simplicity of the Uber interface obfuscates the ability to enjoin with others and pursue the former, especially as the reification of social capital into economic capital intensifies the logics of the latter. Autonomy, in this sense, is strictly conceived in a consumeristic capacity, as fabricated social cohesion wrapped with a slick veneer of simplicity. On the other hand, simplicity is transparent, wherein users can see through the process of constructing this veneer, engendering reflection on the complex legal and economic frameworks undergirding the manifestation of tailored social interactions. When users recognize this ideology of simplicity, autonomous potentials blossom, as the social field becomes viewable, common ground can be struck with social cohorts subject to the very same power constructs, and cohesion can be envisioned as a project of political solidarity, striving for material outcomes such as platform cooperativism. In this sense, recognition entails not only recognizing that which is optically apparent as graphic representation, but also that which can be envisioned or imagined. The Uber interface is both a material form and immaterial process, a field for seeing visual forms and a field for galvanizing the ability to envision and make manifest the as-yet unrealized. As evidenced by the Uber patent application, the interface is the grounds to understand how Uber and users can both imagine and act upon predominant power constructs.

5.8 Uber: Imaginaries of Autonomy

As previously noted, the interface is both a thing and a process. To interface, as a mode of interactivity, is to bring together multiple elements into contact. In addition to its graphical components, Alexander Galloway describes the interface as an “active threshold mediating between two states,” a “generative friction” between elements making contact at this threshold.⁵⁷³ Moreover, as noted by Branden Hookway, it is a “form of relation” enjoining “incompatible entities into a compatibility,”⁵⁷⁴ entities often made compatible through a process of translation, what Orit Halpern refers to as a “translational zone” for processing and translating “the seamless movement of information between different areas.”⁵⁷⁵ While these concepts apply to GUIs and interfacing with computer processes, to understand the interface is to understand culture more generally, as for theorists such as Galloway, Hookway, and Halpern, the interface allegorizes ideological, political, and social forms of relation and translation. Thus, beyond the visual forms of the Uber GUI, Uber’s iconic interface is the grounds for imagination as a translative act, the ability for Uber to imagine the relationship between automated social information and neoliberal monetization and the ability for Uber users to imagine social commonality as the means for an iconoclasm that rejects Uber’s neoliberal imaginary.

Imagination is an act of translation between the real and unrealized. It is both illogical and logical, a rational and irrational sense-making process. For Barbie Zelizer, imagination is the ability to “interpret in a fanciful, illogical baseless, or irrational fashion, with an uneven regard for what is actually shown,”⁵⁷⁶ while Charles Taylor stresses imagination as the translation of seemingly impossible modes of social existence into coherent frameworks for making sense of lived social reality. His concept of “social imaginaries” entails a sense-making process whereby people pull from the complicated multiplicity of social

⁵⁷³ Galloway, Alexander R. *The Interface Effect*. Polity (2012): 23; 31.

⁵⁷⁴ Hookway, Branden. *Interface*. MIT Press (2014): 4; 17.

⁵⁷⁵ Halpern, Orit. *Beautiful data: A history of vision and reason since 1945*. Duke University Press (2015): 68.

⁵⁷⁶ Zelizer, Barbie. *About to die: How news images move the public*. Oxford University Press (2010): 6.

life to establish normative frames for understanding the individual and the wider social field, including “how things go on between them and their fellows, the expectations that are normally met, and the deeper normative notions and images that underline these expectations.”⁵⁷⁷ Where Zelizer conceives of imagination as multiplicitous possibilities extrapolated from visible reality, Taylor’s social imaginaries offers imagination as the way we cohere invisible forces structuring lived reality into a sensible whole. In other words, imagination is a process of translation that structures our sense of *what is* and *what could be*. The notions of visibility and invisibility influencing acts of imaginative translation inform Ned O’Gorman’s “neoliberal imaginary.”

Broadly speaking, neoliberalism applies humanistic concepts of freedom and liberty to contemporary capitalist marketplaces, extolling deregulation, austerity, and privatization as efficient causeways for maximizing socio-economic standards of living. For O’Gorman, neoliberalism is predicated on a belief in “the power of invisible orders to organize and sustain American society” and to cohere a shared understanding of social life as organized around neoliberal principles.⁵⁷⁸ O’Gorman conceives of neoliberalism as a predominant social imaginary for contemporary culture, a “discourse of transcendence that appeals to invisible, unrepresentable orders as the overarching means of organizing and safeguarding society,” what he refers to as a *neoliberal imaginary*.⁵⁷⁹ The neoliberal imaginary translates invisible forces of economics, corporatism, civic politics, and other invisible orders into a coherent mode of social order underpinned by neoliberal logics. Given the interface’s capacity for imaginative translation, the interface is a rich locus for the coherence of invisible orders to assume visual form and for these visual forms to galvanize processes for imagining the invisible orders structuring such forms. Whether a neoliberal imaginary or what we might think of as a *prosocial imaginary*, Uber’s visualization of invisible processes

⁵⁷⁷ Taylor, Charles. “Modern social imaginaries.” *Public Culture* 14, no. 1 (2002): 106.

⁵⁷⁸ O’Gorman, *The Iconoclastic Imagination*, xiii – ix.

⁵⁷⁹ *Ibid* xi.

coursing beneath visible interface contours offers insights into the Uber iconic interface as the grounds to make sense of opposing conceptions of social life.

Notably, within the SMI patent application, Fig. 5 is a graphic depiction of the “communication interface” situated between invisible computational processes internal to the device and invisible external processes that configure visible interface forms. Fig. 5 is shaped as a vertical quadrilateral resembling the common shape of a mobile smart phone. Within the phone shape, a series of vertically-stacked rectangles include, in descending order, “processor,” “main memory,” “ROM,” “storage device,” and “communication interface.” Stretching from the communication interface to an upright tilde external to the phone, a bidirectional arrow indicates the interface corresponds to “pick-up request,” “invites,” and “notifications,” while “network” appears on the far side of the upright tilde. “Pick-up request” is couched within the space between the communication interface and the phone border, while “invites” and “notifications” are situated external to the phone, even as all three appear on the same axial place as the bidirectional arrow. Thus, this figure is a visualization that depicts invisible processes, visible GUI forms, and the interface as a process of translating these invisible processes into graphic representations. In doing so, it offers imaginative possibilities to alternately reinforce neoliberalism as the organizing social logic and envision forms of social solidarity as a sense-making guard against the intensification of neoliberal aims.

In Figure 5, the Uber iconic interface is the sense-making apparatus for evincing and cohering knowledge about economic, legal, and technological orders subsumed within the smart phone. In this sense, the smart phone is the world interiorized, the manifestation of predominant invisible paradigms of technology (processor, ROM), economics (corporate ownership of apps and devices; monetization of computational services), and legality (the totality of the figure as an argument for patent protections). The interface connects to this interiorization of the world, translating the permutations of these invisible

orders in the external world to its interiorized depiction within the smart phone device. Computer interfaces, for O’Gorman, are a means of facilitating and consolidating an “epistemology of abundance,” presumed to be unlimited among virtual spaces and interactions, allegorically aligned with contemporary iconic imagery (i.e. photos and video footage of the 9/11 attacks) that suggests the vast complexities informing social existence could be made knowable if collated into an intelligible interface.⁵⁸⁰ If, as Johanna Drucker notes, interfaces “structure our relation to knowledge visually,”⁵⁸¹ the Uber interface in Figure 5 is a coherent epistemological frame for structuring, facilitating, and consolidating neoliberal logics as the predominant sense-making schema for social existence. The Uber interface translates between the unrepresentable orders of neoliberalism permeating the world at large and the interiority of the world visually depicted in Figure 5, implicitly suggesting a neoliberal imaginary as the structuring logic for understanding the social and one’s place within the social.

The interface as imagery and imaginary reflects entry into a world of “design” in both a technological and economic sense: an interface presents concentrated information technologically-designed to easily retrieve further information while undergirded by neoliberalism’s economic designs for this retrieved user information. When a user receives a notification of a nearby rider who also attended Boise State, to interpret the potential interaction as consumeristic transaction is to latch onto the translational capacity of the interface to present consumption and economic transaction as the intelligible method for making sense of technological, legal, and economic complexities undergirding both this notification and the social world at large. The notification “makes sense” as a consumptive node more so than a node for off-market social solidarity, as the invisible orders of the surrounding neoliberal world reinforce its logics through the efficient, coherent, sensible translational practices of the Uber interface. In this

⁵⁸⁰ O’Gorman, *The Iconoclastic Imagination*, 144.

⁵⁸¹ Drucker, Johanna. *Graphesis: Visual forms of knowledge production*. Harvard University Press (2014): 5.

sense, the neoliberal imaginary instantiates itself as the logical interpretative mode for conceptualizing how we relate to social actors pulled into view by Uber's automated sociality.

However, Figure 5 also beckons consideration of another way to understand the interface, its iconic dimensions, and imaginaries that supersede inevitability of neoliberalism as an epistemological worldview. While O'Gorman notes that iconic representations (such as the Uber interface) are "visible manifestations of invisible truths," the manifestation of such truths does not inevitably entail capitulation to the logics of neoliberalism or related power constructs presiding over social life. In fact, manifestation such as Figure 5 are the grounds on which to undermine predominant invisible power orders and imagine a more egalitarian social existence. Although Figure 5 presents the Uber iconic interface as the means to cohere invisible orders or "truths" permeating the world, it also begs questions about representation itself and the unseen elements such representation proposes to embody. Stemming from its visual forms, an image (be it photographic pictures, GUIs, or infographics) possesses "voice," Barbie Zelizer's term for the ability of images to orient viewers to unseen contexts shaping the manifesting of representational visual forms, including relationships to social actors, orders, and practices. The image's voice is a trigger point, activating the image's value "beyond what it delineates and connotes at first glance" and therefore carries the image and its connotative qualities to other associative contexts "where it can be used by other people, seen through other images, and activated for other aims."⁵⁸² Just as, for Susan Sontag, photographic images are "attempts to contact or lay claim to another reality,"⁵⁸³ an image's voice harkens viewers beyond its contours and representational capacities, imploring viewers to envision the seemingly unrepresentable and question the very things an image presumes to induce as representational paradigms. In this context, the voice of the iconic Uber interface as presented in Figure 5 urges us to question both what it represents as the point of interiorized coherency of neoliberal logics

⁵⁸² Zelizer, *About to Die*, 13.

⁵⁸³ Sontag, Susan. "In Plato's cave." *On Photography* (1977): 16.

and how it represents the translational capacity between this interior world and the complex invisible strands it pulls together from the world at large. Rather than pulling from the outside world, the voice of the interface implies realizing in the white space of the infographic the seemingly unrealizable, as the white space connotes a place the creation of newly social worlds. The Uber interface, then, not only possesses a voice imploring realities beyond neoliberalism; its imaginative possibilities also enabling an iconoclastic capacity to denounce the ideological instantiation of neoliberalism.

Iconoclasm is the rejection or destruction of icons and the things they represent. To be iconoclastic is to question established beliefs, practices, values, and institutions and pursue their destruction for pro-social gain. O’Gorman’s iconoclasm situates the rejection of an icon’s attempt at legitimate representation as an act of both creation and destruction. Drawing from Immanuel Kant’s perspective on the sublime,⁵⁸⁴ O’Gorman’s “iconoclastic sublime”⁵⁸⁵ is the ability to imagine an image that supersedes all other images in its capacity to envision our ultimate subjective and social destiny. It is this very process of imagining such an image that destroys all other images. By envisioning the totality of that which we cannot see, however, we obliterate images that are more visually accessible. O’Gorman’s iconoclastic sublime is thus one in which the act of creation and destruction are not necessarily distinct processes. Instead, the iconoclastic sublime is the weight that imagination brings to bear on our ability to undermine images that crystallize the pervasiveness of invisible orders before such images are again wrested from our grasp. When we consider the example of the Uber iconic interface’s inducement to interact with other social actors based on common links (i.e. collegiate affiliation), the recognition of neoliberalism as an organizing world logic framing such sociality also becomes the means to both destroy the establishment of this paradigm supposed by iconicity and envision a space for creating new subjective and social destinies. Where David Beer stresses the usefulness of analyzing iconic interfaces as the grounds for an

⁵⁸⁴ See: Kant, Immanuel. *Critique of the Power of Judgment*. Cambridge University Press, 2000; Kant, Immanuel, and Werner S. Pluhar. *Critique of judgment*. Hackett Publishing, 1987.

⁵⁸⁵ O’Gorman, *The Iconoclastic Imagination*, 57.

“iconoclastic approach to the new media...to critically examine and reveal the details of the material processes and practices that constitute these complex interfaces,”⁵⁸⁶ O’Gorman’s iconoclastic sublime proceeds from revelation to offer assured footing for the destruction of underlying technological, legal, and economic paradigms sanctifying Uber and other icons of platform economies and the creation of prosocial successors.

By presenting prearranged social interactions indicative of neoliberalism as a sanctioned mode of for placing such sociality in material contexts, Uber’s iconic interface also speaks to users with a vocalized iconoclastic sublime, imploring us to reject the neoliberal orders presumed to cohere and organize invisible “truths” of social life. Through the destruction of neoliberal logics underpinning Uber’s automated sociality, users can collective, cooperative, egalitarian sociality as the means for common links to bring people together. It is, in other words, an opportunity to reject neoliberal imaginaries and envision prosocial imaginaries as organizing rubrics for coalescing knowledge about social life. The risk, however, is that – per O’Gorman - the overdetermination of such imagination encompasses a totality that destroys the ability to envision such imaginaries. Thus, the prosocial imaginary must also ward off utopian imaginings that over-extrapolate from material conditions, lest it undermine the scaffolding that can be created for the advancement of realized social solidarity.

In the context of neoliberal and prosocial imaginaries corresponding to iconic interfaces and iconoclastic potentials, the autonomy of social actors entails a complicated relationship with these dynamics. The intensification of neoliberal imaginaries threatens autonomy as a condition of social solidarity, as the privatizing logics of neoliberalism afford autonomy insofar as autonomy is the province of supply side scions or, as per Uber, an economically-efficient facilitator of social information and social interactions. Even if users experience a heightened sense of autonomy as consumer participants in Uber’s automated sociality, the individualistic nature of consumer autonomy does not offer assured pathways to

⁵⁸⁶ Beer, “The Iconic Interface,” 73.

extend and calibrate individual autonomy with social autonomy. Iconoclasm and the ability to envision a prosocial imaginary is one alleviation to the seeming permanence of neoliberal logics, as the destabilization of neoliberalism's divestment of public goods for privatized ends offers a refreshed vision of autonomy as a prosocial condition, one in which individual self-determination correlates with common good. Nonetheless, movement between neoliberal imaginaries and prosocial imaginaries presents a challenge with respect to the nature of autonomy and iconicity.

If, as Hariman and Lucaites indicate, to be an icon is to "retain a sense of autonomy from either popular tastes or elite interests," and iconic imagery (such as the Uber interface) must "negotiate the trade-off between individual autonomy and collective governance," iconoclasm seemingly threatens this autonomy.⁵⁸⁷ However, this is only the case if iconoclasm is only an act of destruction and does not extend to creative imaginings for life beyond neoliberalism and other presiding powers governing contemporary social life. Iconoclastic strivings against the Uber iconic interface and all it represents can preserve autonomy by, first, rejecting the invisible orders represented by Uber iconicity and, second, imagining sociality as a unified front of commonality and solidarity that seeks to calibrate personal autonomy with collective will and governance. Autonomy, in this context, must therefore carry forward on a prosocial imaginary, else autonomous potentials crumble alongside the denigration of Uber's neoliberal imposition.

With this complication in mind, one final consideration must be brought to bear, as the iconic interface is fraught not only with tensions between complexity and simplicity, invisibility and visibility, neoliberalism and prosociality, or other oppositional couplings brought into contact and compatible at the interface; Uber's iconic interface is also a connective membrane casting relational elements into oppositional trajectories, a "relay for abstraction" that also casts asunder what it brings together.

⁵⁸⁷ Hariman and Lucaites, *No Caption Needed*, 115; 14.

5.9 Uber: Abstracting Autonomy

Within the SMI patent application, Uber stresses “commonality” as a process corresponding to invisible processes and visible forms. Uber gives visual form to both, even though Uber riders are not privy to this full spectrum of pictorial visibility. The establishment of a “common link” between potential riders generates a notification that appears on the GUI, such as the example of two riders who attended Boise State. Figure 3, an infographic, visualizes the otherwise invisible process of establishing commonality among potential riders. Situated between sequential processes “access social media data” and “identify common links” for each applicable user, a series of potential common links appear in individualized brackets. The common links include “friends,” “hobbies,” “interests,” “places,” “profession,” and “origins,” although, as the appendix makes clear, commonalities are not limited to these rubrics, as other common links may include “educational institution,” “company,” or “preferences” such as entertainment tastes.⁵⁸⁸ Preceding sections note the relationship between such commonalities and autonomy in the context of simplicity and complexity, invisibility and visible, each of which respectively illuminates the interface’s capacity to obfuscate, reveal, cohere, and manifest representational forms and orient a user’s contemplative gaze. One of the underlying dimensions that requires consideration is the Uber iconic interface’s relationship with abstraction. If preceding notions of the interface as enabling contact, compatibility, and coherency engender notions of parallel congruency and proportionality of elements on either side of the interfacial boundary, the atomization of commonality within the Uber patent application relieves such notions and imparts further stakes for Uber’s automated sociality. By way of explanatory metaphor, the Uber iconic interface is not a midpoint fold between the two sides of a Rorschach blot’s mirrored symmetry; instead, Uber’s iconic interface is a relay with the potential to at once cohere and cast opposing elements into opposing trajectories of varying intensity, duration, and proximity, a

⁵⁸⁸ Bijor et al, “Social Media Integration.”

relay for abstraction exemplified by commonality as both a particulate techno-social trait and a higher-order social condition.

Where photographic imagery function as “implicative relays” between what the camera captures and what transpires beyond the frame of the camera⁵⁸⁹ and “ideological relays” between the infusion of ideological forces and the salience of such forces in graphic depiction,⁵⁹⁰ these conceptions suggest an abstracting function, one that is heightened by the interface as both coagulation of graphical representations and an interactive paradigm forming relations and compatibility. Interfaces themselves encompass are a “succession of relays” forging pathways for connectivity, even as they “slice, cleave, and individuate” aspects of the elements pulled into contact and compatibility.⁵⁹¹ Interfaces, in this regard, both collide and repel, and in doing so their boundaries serve as a relay for abstracting the things that are pulled apart and reconstituted.

With regard to such abstraction, the Uber iconic interface is the nexus for an “aesthetics of abstraction,” a threshold encounter that abstracts between the sleek, polished, intuitive GUI and underlying complexities necessary to generate this type of presentation.⁵⁹² In explicating this aesthetics of abstraction, Ed Finn describes the Uber interface as an abstraction between “socio-economic infrastructures” and a veneer of simplicity, as well as a “legal interface that abstracts risk away into generalized blanket insurance policies covering every driver and passenger,” functioning in accordance with an “interface economy” relying on such abstractive techniques.⁵⁹³

In this sense, the depiction of commonalities such as “friends” or “profession” within Figure 3 abstracts distinctions between what they signify as profound social bonds and what they signify as oversimplified links between potential consumers. Friendships signify an interpersonal kinship of relatively

⁵⁸⁹ Zelizer, *About To Die*,

⁵⁹⁰ Hariman and Lucaites, *No Caption Needed*, 9-10.

⁵⁹¹ Bratton, Benjamin H. *The stack: On software and sovereignty*. MIT Press (2016): 230; 221.

⁵⁹² Finn, Ed. *What algorithms want: Imagination in the age of computing*. MIT Press (2017): 97.

⁵⁹³ *Ibid* 123-124.

mutual depth and investment, a bond between two or more people that supersedes commonality as mere similar traits or interests. For a user to receive via the Uber GUI a notification of potential ridesharing partners based on common friends, this conception of “friends” owes more to its connotation as a social media connection of indeterminate magnitude than a qualified conception of two people’s bond. It is an abstraction between deep interpersonal intimacy and “an atomized form of intimacy, a series of fleeting, close encounters with strangers that are managed and underwritten by algorithmic culture machines”⁵⁹⁴ (129). The stakes of this brand of abstraction correspond to Uber’s algorithmic culture machine as more prolifically and intensely subsuming social intimacy and presenting it as preferential mode for engaging social others, an abstraction between close-knit social commonality capable of proffering social change and closely-knitted automated processes for atomizing social characteristics within algorithmic-capitalist machinery. For a user receiving a notification based on common friendship, the Uber iconic interface is the relay point for such abstraction, exemplifying the abstraction between lived social relations and the detachment of such relations into the increasingly stratified economic abstractions of contemporary capitalism.

As previously noted, interfaces do not entail a midpoint between paradigms of equal proportionality. As relays for abstraction in techno-economic molds, the Uber iconic interface is an orienting force in a capitalist vortex that divests from lived social relations with an unequal regard for expanding opportunities for social solidarity and expending the monetized value of extracted social commonality. This notion of a capitalist vortex stems from Nick Dyer-Witheford’s offering of a vortex to allegorize conditions between human labor and the commodification of such labor in contemporary digital capitalism. His explication of a “capitalist vortex” is a viable means for likewise explicating the Uber iconic interface as a relay for the abstraction of disproportionate social and economic conditions, one that risks inducing a “real abstraction.” Although a vortex moves in circular formation, it possesses a verticality with “the

⁵⁹⁴ Finn, *What Algorithms Want*, 129.

downward suction of a whirlpool, the upward pull of a tornado’s funnel,” a process of siphoning and filtering in opposing directions, for a vortex need not pull upwards at the same scale and magnitude as it siphons.⁵⁹⁵ Amidst contemporary digital economies, the vortex has become a “machinic whirlwind,” as the increasing speed and proliferation of automated commoditization accelerates production and circulation of “self-expanding value” siphoned from human being, their labor, and, in the case of Uber, commonalities fed into the mechanic whirlwind of its proposed automated sociality.⁵⁹⁶ The Uber iconic interface is the eye of this proverbial storm, a zone emitting a sense of calm and harmony, abstracting between underlying tumult siphoning off abundances of commonality from users’ digital sociality and Uber’s commodification of this commonality to weather the storm-like volatility and turbulence of digital economies. Consequentially, the Uber iconic interface abstracts between highly-inequitable extractions of social commonality and the coalescing of such extractions into economic capital that can expand upon itself without expanding upon the commonality from which it siphons. Moreover, as the eye of the storm, the Uber iconic interface’s sense of calm and harmony threatens to induce a real abstraction that installs a common belief that this type of commodified commonality is the most viable way to understand social relations.

In a Marxian context, real abstraction is a phenomenon that exists only in the minds of humans, even though its basis springs from real social relations. Money is a fruitful example. Money, as a commodity, functions only insofar as people believe it possesses real implications and effects. Money does not innately possess a value – this value is granted by human acknowledgement and use. Even though money is not “real” in terms of its natural qualities, it portends “real” consequences, such as the use of money to purchase labor, goods, and services and the social relations constituted by such actions. Rob-

⁵⁹⁵ Nick, Dyer-Witheford. *Cyber-Proletariat: Global Labour in the Digital Vortex*. Pluto Press (2015): 19.

⁵⁹⁶ *Ibid* 25; 22.

ert Gehl aligns real abstraction with the computational process of abstraction whereby software programming abstracts between the materiality of a machine's hardware and the software that performs on the hardware. Through abstraction, programmers "hide the material machine behind increasingly complex layers of code," an abstraction between the material and immaterial not unlike the abstraction of material money and immaterial exchange value.⁵⁹⁷ If, per Gehl's admonition, social media sites entail "a software abstraction capable of directing users' concrete labor, social relations, and interactions" (81), and such software is "engineered to privilege and enhance certain users while closing off others,"⁵⁹⁸ the incorporation of social media users and information into Uber's automated software processes suggests a further abstraction between lived social commonality and its manifestation as a commodified interaction on the Uber interface. More critically, however, it suggests a real abstraction whereby Uber's automated sociality is acknowledged as the proper and logical means of generating social interaction. In other words, the Uber iconic interface is a relay that abstracts between material social relations of the real and immaterial socio-economic relations of the digitally virtual wherein the latter constitutes a shared belief regarding the lived reality of social commonality.

The risk here is that the elasticity of the vortical pull of the Uber iconic interface abstracts notions of autonomy as lived social vitality and a techno-corporate affordance wherein the latter gestures towards cultural dispositions that envision autonomous technologies as invariably sapping the social vitality from human autonomy. As I have argued in this chapter, and in this dissertation as a whole, such conceptions are misguided, yet the potential of a real abstraction offers an important caution: the risk autonomous technologies need not be real in a material sense but only insofar as social beliefs foment around this inevitability, thereby undermining the autonomous potential to shape a society that conceives and strives for harmony with machines that increasingly remind us of our own autonomy.

⁵⁹⁷ Gehl, Robert W. *Reverse Engineering Social Media: Software, Culture, and Political Economy in New Media Capitalism*. Temple University Press (2014): 75.

⁵⁹⁸ *Ibid* 81; 5.

5.10 Conclusion

This chapter analyzed an Uber application to patent a process for integrating and automating social media information as part of the company's ridesharing services. Whereas scholarship on the automation as a paradigm inflecting upon and interjecting within the social, this chapter considered the autonomy of social actors when the social itself is subsumed within technological and economic power structures potentially protected by legal accord. By conceptualizing Uber's interface as iconic and the persistence of its iconic dimensions within the typographical and pictorial components of the patent application, this analysis yielded three interrelated complications that stress the implications of autonomy amidst intensified automated sociality.

First, Uber's intention to incorporate the social while maintaining a simplified interface entails a simplicity that both masks the complexities of automated sociality and enables users to see through this process, alternately restricting user autonomy by obfuscating the complex economic, technological, and legal circumstances informing Uber's automated sociality and granting autonomy through an overreliance on simplicity that enables users to reveal these otherwise masked complexities. Second, Uber's iconic interface coheres invisible orders of neoliberal society, inducing a neoliberal imaginary that structures the increasing privatization of social actors and information as the logical means of conceptualizing social interaction. Whereas the neoliberal imaginary proffers autonomy as a condition for neoliberal power brokers or consumeristic variability, the coherence of the Uber iconic interface also enables the iconoclastic rejection of neoliberal imaginaries, investing social actors with autonomy through prosocial imaginaries that both destroy iconicity and create the means to envision social solidarity. Finally, the Uber iconic interface is a relay for abstraction that casts into opposing directions of inequitable proportionality the real conditions of social life and an automated sociality that self-replicates the commoditization of this capital. If subject to a real abstraction that understands the immaterial nature of commodified sociality as the real conditions of social life, social autonomy becomes neutralized not because of

the increasing autonomous sophistication of automated technology, but because of the instantiated belief that techno-economic autonomy is the way autonomy can be experienced.

6 CONCLUSION

As the old maxim goes, hindsight is 20/20. For Andrew Yang, however, the year 2020 is about foresight – envisioning millions of jobs soon to be eliminated as a result of automation. Yang is a 2020 U.S. presidential candidate running on a platform of “humanity first,” foregrounding universal basic income (UBI) as the primary economic mechanism to alleviate the “unprecedented crisis” of a current automation wave threatening 1/3 of American workers poised to lose their job to automation over the next 12 years.⁵⁹⁹ In a Feb. 2018 *New York Times* profile under the headline “His 2020 Campaign Message: The Robots Are Coming,” Yang forewarned that “all you need is self-driving cars to destabilize society” and offered a “freedom dividend” as a stabilizing force against the threat posed by autonomous vehicles.⁶⁰⁰ A freedom dividend is Yang’s own brand of UBI in which all Americans age 18 to 64 receive a monthly check for \$1,000 without deference to income or employment. The freedom dividend is a critical component of addressing job-stealing robots and progressing towards a new form of capitalism – a “human capitalism” predicated on the valuation of human life over money, human beings as the primary unit of the economy (rather than dollars), and the ability of markets to serve shared social goals and values.⁶⁰¹ The blurb for Yang’s April 2018 book *The War on Normal People: The Truth About America’s Disappearing Jobs and Why Universal Basic Income Is Our Future* (2018) begins by noting “the shift towards automation is about to create a tsunami of employment” and ends by advocating for UBI as an “essential step” towards the “new, more durable kind of economy” that is human capitalism.⁶⁰² If job-stealing robots are a dystopia stormfront, human capitalism is the utopian stormbreaker. As an entrepreneur concerned about the relationship between human dignity and automated sophistication, Yang is one of

⁵⁹⁹ “What is UBI?” <https://www.yang2020.com/what-is-ubi/>.

⁶⁰⁰ Kevin Roose, “His 2020 Campaign Message: The Robots Are Coming,” *New York Times*, Feb. 10, 2018, <https://www.nytimes.com/2018/02/10/technology/his-2020-campaign-message-the-robots-are-coming.html?smid=tw-nytimesbusiness&smtyp=cur>.

⁶⁰¹ “Human Capitalism,” <https://www.yang2020.com/policies/human-capitalism/>.

⁶⁰² Andrew Yang, *The War On Normal People: The Truth About America’s Disappearing Jobs and Why Universal Basic Income Is Our Future*. Hachette Books, 2018.

a growing number of marketplace magnates making public proclamations of dystopic and utopic proportions.

As indicated by an ongoing public feud, Elon Musk and Mark Zuckerberg represent diametrically-opposed poles on the automation debate, even as Musk and Zuckerberg agree with Yang's support for a version of UBI. In a June 9, 2018 long-form look at the debate over "killer robots," *The New York Times* cites Musk's doomsaying and Zuckerberg's optimism around automation, both for the perspectives each brings to bear on the debate and the way their debate stands in a larger divide among those who see automation as a boon for human enterprise and those who envision the end of the human era on the backs of automated "superintelligence."⁶⁰³ Both Musk and Zuckerberg, however, are at least somewhat economically-incentivized towards their respective poles, as Zuckerberg seeks to recover public confidence in Facebook and its automated retrieval and usage of user information in the wake of the Cambridge Analytica data-harvesting scandal,⁶⁰⁴ while Musk's Neuralink startup – propped up by \$100 million in venture capital - proposes to develop a "brain interface" enabling humans to achieve communicative parity with superintelligent robots.⁶⁰⁵ Halfway into 2018, motifs of robot overlords and job-stealing robots occupy a central place in cultural imaginaries and economic realities.

Despite the predominance of these narrative motifs and marketplace disposition, hints of less polarized conceptions can be found in the crevices of very recent cultural narratives around automation and autonomous technologies. Released in late 2017, Annalee Newitz's novel *Autonomous* (2017) tells the story of the human Elias and AI Paladin in pursuit of "anti-patent scientist turned drug pirate" Jack whose pirated drugs cause people to become dangerously addicted to work. While helping Elias pursue

⁶⁰³ Cade Metz, "Mark Zuckerberg, Elon Musk and the Feud Over Killer Robots," *New York Times*, June 9, 2018.

⁶⁰⁴ See: Timothy B. Lee, "Facebook's Cambridge Analytica scandal, explained," *Ars Technica*, Mar. 20, 2018, <https://arstechnica.com/tech-policy/2018/03/facebooks-cambridge-analytica-scandal-explained/>.

⁶⁰⁵ Metz, "The Feud Over Killer Robots."

Jack, Paladin's discovery of gender and sexual fluidity emanates from her "pursuit of autonomy."⁶⁰⁶ Paladin's autonomy, in this context, is not an intelligence that tramples on human dignity. Instead, Paladin's pursuit of autonomy is relatively indistinguishable from a human striving for autonomy – learning about one's self and one's place in the world, removing oppressive barriers, and seeking dignity and satisfaction based on an unimpeded means of determining and enacting directed purpose. In other words, Paladin seeks to discover herself and possess the means to be her truest self, just as humans do in the context of gender identity and other social arenas. The world of *Autonomous* is neither purely dystopic nor utopia; instead, it is a "'topia," a combination of both, envisioned by Newitz as a world of "hard-won hope" demanding struggle and ongoing work that resists an easy grab for utopian or dystopian poles.⁶⁰⁷

While complex cultural representations are welcome, automation is significantly underrepresented in media studies literatures, despite the escalating significance of automation to media industries, audiences, texts, platforms, technologies, and cultural practices undertaken by industries and users. Relatedly, automation and autonomous agents are – and have been – a source of central concern among computer scientists, engineers, human-computer interactionists, and related interdisciplinary approaches to computational phenomena. Despite the considerable insights derived by scholars among these latter disciplines, the cultural sweep of automation as both a source of media representations and a primary mediating force among humans and digital interactions speaks to the need for the insights gained from my approach to human-machine autonomy and the groundwork it lays for subsequent assessments. Further, such assessments need not adhere to siloed conceptions of media studies and fields with similar topical concerns, as one of the primary aims of this project is to establish connective tissue with adjacent fields (i.e. STS, HCI) with concerns for media and technological phenomena poised to increasingly structure the ways culture at large conceives of technologically-mediated interactions and the

⁶⁰⁶ Maddie Crum, "Annalee Newitz Is Imagining The Future of Work," Literary Hub, Oct. 17, 2017, <https://lithub.com/annalee-newitz-is-imagining-the-future-of-work/>.

⁶⁰⁷ Ibid.

implications for social life. Human-machine autonomy is therefore not only a conceptual field in which autonomy is shared a shared condition, it is a theoretical frame viable for scholarly fields in which automation, autonomy, and related concerns are a shared concern. After reiterating my overarching aims, methodology, and outcomes, in closing I will reiterate the specific claims resulting from my methodological approach and, in doing so, offer implications and potential future orientations that can add precision and levity to considering automation and autonomous technologies.

As opposed to conceptions of highly-automated technologies as oriented towards dystopian or utopian horizons in which human autonomy is respectively vanquished or totalized by autonomous technological counterparts, mediated interactions with such contemporary automation constitutes a field for the exchange of autonomy, a human-machine autonomy with alternating potentials for autonomous realizations circulating within this field. Human-machine autonomy epitomizes the cultural significance of automated technologies increasingly possessive of variable, flexible, and precise intelligence undergirding operational designations of technological autonomy. Human-machine autonomy connects the material means of developing and proliferating such technologies to lived realities of shaping how humans can understand and experience autonomy, including analogical and allegorical relationships between complex machines and the complexities of human social life. Human-machine autonomy stresses industrial practices as verdant ground for staking claims about notions of autonomy built into automated technologies and the persistence of these notions in contexts of reception. Human-machine autonomy elevates discourse analysis and digital media theory as methodological touchstones most capable of illuminating, contextualizing, analogizing, and allegorizing complications of autonomy from industrial imagination to cultural profundity. Human-machine autonomy builds bridges to disciplinary areas with allied concerns for automation and its implications. For scholars in a range of areas and sub-disciplines, my approach to human-machine autonomy offers assured pathways for successive inquires,

especially as the evolution of automation and autonomous possibilities occurs with considerable speed and scale.

Chapters 2 and 3 situate policy texts as critical sites for conceiving of autonomy amidst legal and political realities shaping corporate practices. **Chapter 2** focused on attempts by Tesla CEO Elon Musk to associate his company's Autopilot technology with a "full autonomy" that extends to both Autopilot and passengers in autonomous Autopilot-powered vehicles. My approach analyzed the first formal federal policy to recommend consolidated practices for outlining regulatory scope, enacting state-level policies around highly-automated vehicles, and urging design specifications – the Federal Automated Vehicles Policy (FAVP). My analysis primarily focused on the federal adoption of SAE levels of automation in this policy as they correspond to potential regulatory, policy, and design implications. More critically, however, in their attempt to encode legal and technological designations, policymakers and scientific experts embedded shifting conceptions of human autonomy that merge out of notions of control as both a source and inhibitor of personal and social freedom. Through a methodology that situated FAVP as a discursive nodal point interconnected with preceding attempts to anticipate and contest legal, technological, and related distinctions automation, control, and freedom that give rise to how policymakers envision and anticipate the cultural significance of automated vehicles and human transport in such vehicles. By leveraging digital media theory – particularly those concerned with convergence and software affordances – I contextualized and gave levity to how political notions of autonomy correspond to technosocio conditions, especially around control.

Through this approach, I began by arguing for Elon's Musk conception of full autonomy on the grounds that it is indicative of cultural applications and interpretations of autonomy in relation to Autopilot and other automated vehicles. While this conception reworks cultural fears around autonomous technology, it is definitionally and theoretically insufficient to describe the complications of human au-

tonomy that can emerge from rigorous analysis. From this point, I argued for an ideology of human autonomy as a condition modeled in policy stipulations for technological and social control; human autonomy as a condition modulated in its intensities and opportunities by political power struggles; and modulated in accordance with implications for the intersection of driving and media usage as cultural activities transpiring during passage in automated vehicles.

Chapter 2 lays the groundwork for scholars to latch onto a nuanced conception of autonomy that resists the dystopic and utopic claims among pop culture, industry, and others with a vested interest such stratification. Furthermore, it provides a methodological means of charting relationships between a company's economic motivations for promoting autonomous potential among its technology and legal frameworks mitigating the design and usage of such technologies. As the direct subject of considerable municipal, state, and federal regulatory schemas, considering the implications of Autopilot and other technologies powering autonomous vehicles demands an approach that scrutinizes the interrelated dynamics between regulation and the companies, technologies, and workers subject to its recommendations and provisions, especially as the content of legal code includes guidelines for design, usage, and cultural integration. In this way, by situating the FAVP as a critical locus for conceiving of the significance of Autopilot, this chapter enables scholars to chart assured connections between regulatory schemas, corporate ideologies, and everyday uses. As autonomous vehicles look to to integrate *with* smart cities, smart highways, and other Internet of Things paradigms, as well as integrate media interfaces and opportunities for mobile media interaction *within* the vehicular form, my approach provides a foundational means of assessing how, when, if, and to what degree humans experience autonomy by examining how notions of autonomy were always already prefigured by political contestations over regulatory scope and purview.

Chapter 3 considered the relationship between the centrality of IBM's Watson AI to the company's business portfolio and the company's motivations to leverage policy to economically underwrite

the training and upskilling of high-tech “New Collar” workers capable of working with Watson. When the New Collar Jobs Act was introduced into the U.S. House of Representatives in July 2017, the Act reflected IBM’s cultural construction of New Collar Work and provisions central to its corporate goals, particularly as the Act enables IBM to seek remuneration for its encroachment into vocational training and cybersecurity initiatives in tandem with the importance of Watson to these and related company initiatives. In doing so, IBM situates Watson as an enhancer of human autonomy in the context of employability and productive vitality, even as the Act and the logics of New Collar speak to IBM’s corporate autonomy as the company attempts to navigate shifts to its business model and digital economies.

As I demonstrated through analysis of the New Collar Jobs Act, New Collar work emerges out of IBM’s strategic use of “augmentation” to describe the productive and intellectual capacities of humans enhanced by collaboration with Watson and “cognitive” as a rubric for reconceptualizing Watson and IBM’s contemporary marketplace prowess. On this latter front, IBM’s insistence on the augmentative capacities of Watson stems from a preference for “cognitive” as opposed to “artificial” intelligence, a means of reversing AI-based dystopian implications for human vitality and stressing the ability of Watson to inflect tech workers with its automated cognition. Moreover, “cognitive” also exemplifies IBM’s attempt to assert its prowess in contemporary digital economies by stressing Watson as the signifier of the “cognitive era” of computing and IBM as the progenitor and corporate titan of this era. Ultimately, this chapter stresses the importance of autonomy as a critical attribute among IBM’s politico-economic motivations and ensuing implications for emerging tech workers.

Chapter 3 situated policy as aligned with corporate ideologies and motivations for propagating notions of technological intelligence as enhancing the autonomy of human workers. Whereas chapter 2 conceived of regulatory policy as transpiring at a relative remove from corporate practice, this chapter highlights the role of policy as an opportunity to economically underwrite circumstances impending on the extent to which humans incur autonomous potential for jobs training, employment, and productive

undertakings. Scholars concerned with the relationship between automation and jobs should examine policy with an eye towards the extent to which its provisions collide or repels with corporate goals and motivations, especially as political climates can incline towards supply-side investment as the means of fomenting educational, vocational, and employment opportunities. Likewise, this chapter provides a means to continue assessing shifting labor categories supposing technological sophistication, both in terms of the technology's affordances and a human's ability to undertake complex work through such technology.

Chapter 4 analyzes complications of autonomy arising from Amazon's intent to market Alexa as the go-to consumer device for home automation. The considerable presence of Alexa at the 2017 Consumer Electronics Show (CES) and ensuing trade press provided the primary means of allegorizing the relationship between notions of autonomy built into a gendered technology and cultural ideologies of women's autonomy among public and private spheres. By demonstrating the ways new domestic technologies tend to both resist and capitulate to gendered conceptions of power and autonomy across public and private life, I argued that Alexa should be understood as possessed with complicated and contrasting autonomous potentials with respect to home automation and interrelated gender dynamics of domesticity and technology. As a gendered technology, Alexa allegorizes autonomy as an alternately ennobled and restricted condition for social life.

One of the first complications is Alexa's autonomy in relation to software and hardware. As a singular software agent widely interoperable with a vast array of hardware devices and systems, Alexa encompasses gendered associations of *software* and *soft* power, associations with unthinking bodily automaticity, ineffectiveness for political change, and a highly diminished autonomy. On the other hand, Amazon markets Alexa as the "brain" of its Echo device, uplifting Alexa as highly-intelligent and politically empowered, a *soft empowerment* ennobling of autonomous potential that can be constructed, mobi-

lized, and shared in accordance with soft power's quest for affinity, kinship, and political plurality. In the context of work performed within the automated home, Amazon marketing dovetails with circumscribed notions of women as domestic laborers performing servile undertakings readying the home for respite from the workaday masculine world. Contrarily, however, Alexa is construed as possessing mastery of creative and flexible traits that enable her to determine mediated interactions, an autonomy in which Alexa is endowed with decision-making capacities for cultivating media, mediated interactions, and the professional and creative expertise associated with such capacities.

When Alexa's mobile capabilities are brought to bear, a tripartite dynamic emerges. In one view, Alexa possesses little autonomy to move from the domestic sphere into public life, as the Alexa mobile app transforms public life into a virtual domestic "room" such that Alexa is cordoned off from public life even when transported via mobile hardware out of the home. In another view, Amazon's insistence that Alexa "lives" in the computational cloud situates Alexa as omnipresent among public and domestic life, autonomously moving in space and time, permeating the non-space of the cloud and carrying with it utopian ideals of derealized and deconstructed social and spatial power dynamics. Finally, public APIs that enable third-party "hobbyist" developers to integrate Alexa into non-Amazon products and enhance Alexa skills resurface separations between an economic and technologically savvy masculine public and an emotional and technologically-consumptive feminized home. In this view, hobbyists writing and compiling code for public APIs associates with long-standing notions of public masculine work that drives economic vitality, as Alexa's skills become associated with emotional work, the invisibility of this work, and the declining recognition of women as integral and foundational to the inception of profound computational paradigms. In this way, Alexa's autonomy is not only diminished, but risks a similar paradoxical decline if Alexa's increasing prolificacy and capabilities likewise become disassociated with the foundational attributes of women's contributions and characteristics.

Chapter 4 offers a critical frame for scholars researching in areas concerned with the intersection of emerging technologies, gender, space, and marketing. More specifically, scholars with an interest in gendered automated technologies such as Alexa, Cortana, Siri, and Google Assistant can better conceive of the motivations for gendered notions of autonomy by paying heed to marketing texts and discourse. Marketing cross-cuts the ways industry imagines, designs, produces and disseminates automated technologies and, in doing so, stresses contexts for automated integration and usage that serve corporate goals for marketplace penetration. As the wealthiest person in history, Jeff Bezos' upstream concerns for maximizing Amazon's bottom line, alongside the company's attempt to secure municipal economic incentives for its H2 headquarters, indicate cultural implications of considerable magnitude for a company that consciously designs and personifies a gendered automated technology and foregrounds home productivity as the naturalized manifestation of its primary uses. Marketing unpacks unconscious aspects of autonomy amidst these conscious machinations, further enabling scholars to connect conscious acts revealed in marketing discourse with analogical and allegorical implications for women's autonomy among public and private spaces.

Chapter 5 analyzed an Uber application to patent a process for integrating and automating social media information as part of the company's ridesharing services. By conceptualizing Uber's interface as iconic and the persistence of its iconic dimensions within the typographical and pictorial components of the patent application, this analysis yielded three interrelated complications that stress the implications of autonomy amidst intensified automated sociality.

First, Uber's intention to incorporate the social while maintaining a simplified interface entails a simplicity that both masks the complexities of automated sociality and enables users to see through this process, alternately restricting user autonomy by obfuscating the complex economic, technological, and legal circumstances informing Uber's automated sociality and granting autonomy through an overreliance on simplicity that enables users to reveal these otherwise masked complexities. Second, Uber's

iconic interface coheres invisible orders of neoliberal society, inducing a neoliberal imaginary that structures the increasing privatization of social actors and information as the logical means of conceptualizing social interaction. Whereas the neoliberal imaginary proffers autonomy as a condition for neoliberal power brokers or consumeristic variability, the coherence of the Uber iconic interface also enables the iconoclastic rejection of neoliberal imaginaries, investing social actors with autonomy through prosocial imaginaries that both destroy iconicity and create the means to envision social solidarity. Finally, the Uber iconic interface is a relay for abstraction that casts into opposing directions of inequitable proportionality the real conditions of social life and an automated sociality that self-replicates the commoditization of this capital. If subject to a real abstraction that understands the immaterial nature of commodified sociality as the real conditions of social life, social autonomy becomes neutralized not because of the increasing autonomous sophistication of automated technology, but because of the instantiated belief that techno-economic autonomy is the way autonomy can be experienced.

Chapter 5 enables profound connectivity among industrial pursuits for intellectual property protection, technological design and usage, and implications for social life. By conceiving of the social as subsumed within automated processes seeking legal protections for marketplace versatility, scholars with stakes in the automation of social media, mobile media, and applications, scholars can analyze patents for what they reveal about the stakes of automation in the context of social solidarity and the social as a commodifiable form subject to automated logics. Furthermore, this chapter's combination of visual rhetoric, discourse analysis, and interface theory invokes the importance of industrial texts as sources of both pictorial and typographical discourse and the ways such pictorial representation unearths ideological assumptions distinct from purely typographical content. This is especially critical as the pictorial dimensions of interfaces alternately obfuscate or reveal the conditions to which automated users are subject, including their own reified sociality. By pulling together these strands, researchers will

emerge with a more precise picture of autonomy as a condition render visible or invisible and the techno-legal machinations shaping relationships between social autonomy as social commodities.

In these ways, my approach to human-machine autonomy implores scholars consider the relationship between automation and autonomy as a co-evolving progression of economic, legal, political and social considerations most precisely illuminated through assessments of industrial deep texts, discourse stretching across networked textual encounters, and theoretical frameworks situating these dynamics in their critical contexts.

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