ELECTRIC SHEEP:

ANALYZING AMERICAN SOCIETAL ANXIETIES TOWARDS ARTIFICIAL INTELLIGENCE THROUGH POPULAR MEDIA, 1921-2014

by

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Electric Sheep: Analyzing American Societal Anxieties Towards Artificial Intelligence Through Popular Media, 1921-2014

Thesis directed by Professor Mark Pittenger

While scientists continue to test the boundaries and the ethical limitations of artificial intelligence (A.I.), they create an omnipresent trend of distrust and, more importantly, fear. From 1921 to 2014, A.I. functioned as an undeniable threat in film, literature, and television, commenting on societal perceptions, subconscious fears, and unexplored anxieties. This thesis aims to observe and contextualize the growing struggle between human and machine using popular media and their reviews to conceptualize societal anxieties. It also casts light on two broader concerns: the growing role of artificial intelligence in our daily lives and what we can learn from popular media over the last two centuries. Themes like gender, oppression, the definition of humanity, and fear of control frame this analysis, with these themes appearing throughout the twentieth and twenty-first centuries. By contextualizing these cultural objects within the history of artificial intelligence – from the Cold War to the digital revolution – we can better understand our anxieties towards artificial intelligence and the implications of accepting it into our lives.

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Isaac Newton famously once said, "If I have seen further, it is by standing on the shoulders of giants."[1] This thesis would have been impossible without these giants.

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[1] James Gleick, *Isaac Newton* (New York, NY: Vintage Books, 2004).

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INTRODUCTION

"There was none among the myriads of men who existed who would pity or assist me; and should I feel kindness towards my enemies? No: from that moment I declared everlasting war against the species, and, more than all, against him who had formed me, and sent me forth to this insupportable misery."

Mary Shelley, *Frankenstein* (1818)

Victor Frankenstein, more than anyone, found the likes of his Monster "wretched" and "miserable." A creation devoted entirely to testing the limits of life and death, the Monster's purpose was solely to act as a vehicle of scientific invention. Perhaps the most common and well-known example of "artificial intelligence," the pieced-together lifeform existed in an existential void, unfinished, undeveloped, and uncultured. Victor, throughout his time with his Monster, found that even the creature was not immune to the human condition, displaying not only emotion, but also conflict, morality, and growth throughout Mary Shelley's novel *Frankenstein* (1818).[1]

This battle between the definition and realization of humanity frames the following study, which observes one aspect of the growing struggle between human and machine across the American twentieth and twenty-first centuries. In a poll conducted by CBS News in December of 1999, 70 percent of those interviewed believed that science would create robots that look and act like human beings.[2] As Stephen Hawking told the BBC in 2014, "The development of full

[1] Mary Shelley, *Frankenstein*, 3rd ed. (Mineola, NY: Dover Publications, 1994).
[2] The remaining 26 percent of those individuals polled said no, while 4 percent didn't know or had no answer.; "In the Next Century, Do You Think We Will Be Able to Create Robots That Look and Act like Human Beings?" (CBS News, December 17, 1999).

artificial intelligence could spell the end of the human race… It would take off on its own, and re-design itself at an ever-increasing rate. Humans, who are limited by slow biological evolution, couldn't compete, and would be superseded."[3] Such fears are only exacerbated by the condition of artificial intelligence in popular media. With films like Stanley Kubrick's magnum opus *2001: A Space Odyssey* and *Terminator* permeating our culture with stories driven by conflict between man and robot, these forms of artificial intelligence appear as the primary threat in literature, television, and film. This study uses reviews of popular media since the 1920s to analyze societal anxieties towards artificial intelligence. By studying these sources, we can better understand the "popular" view towards the main conflicts present in these films, novels, and television shows (and a single play that serves as the starting point for the study). Popular tropes in these cultural pieces include "turn against [the A.I.'s] master," "kill all humans," and "take over the world," framing the current and past state of interaction in popular media. As shown in the following graph, the reader can see a gradual increase in appearances of artificial intelligence acting as the driving force in plots creating fictional cautionary tales and leaving the viewer or reader with an experience comparable to modern folklore.[4] We especially see a rise in appearances in the late nineteen seventies and early eighties, as the computer entered the home for many families and communities.

[3] Rory Cellan-Jones, "Stephen Hawking Warns Artificial Intelligence Could End Mankind," *BBC*, December 2, 2014, https://www.bbc.com/news/technology-30290540.
[4] Graph created by the author using data from a general overview of film, literature, and television appearances of artificial intelligence. By no means is this data set complete or comprehensive; however, it does provide a substantial analysis of general trends.

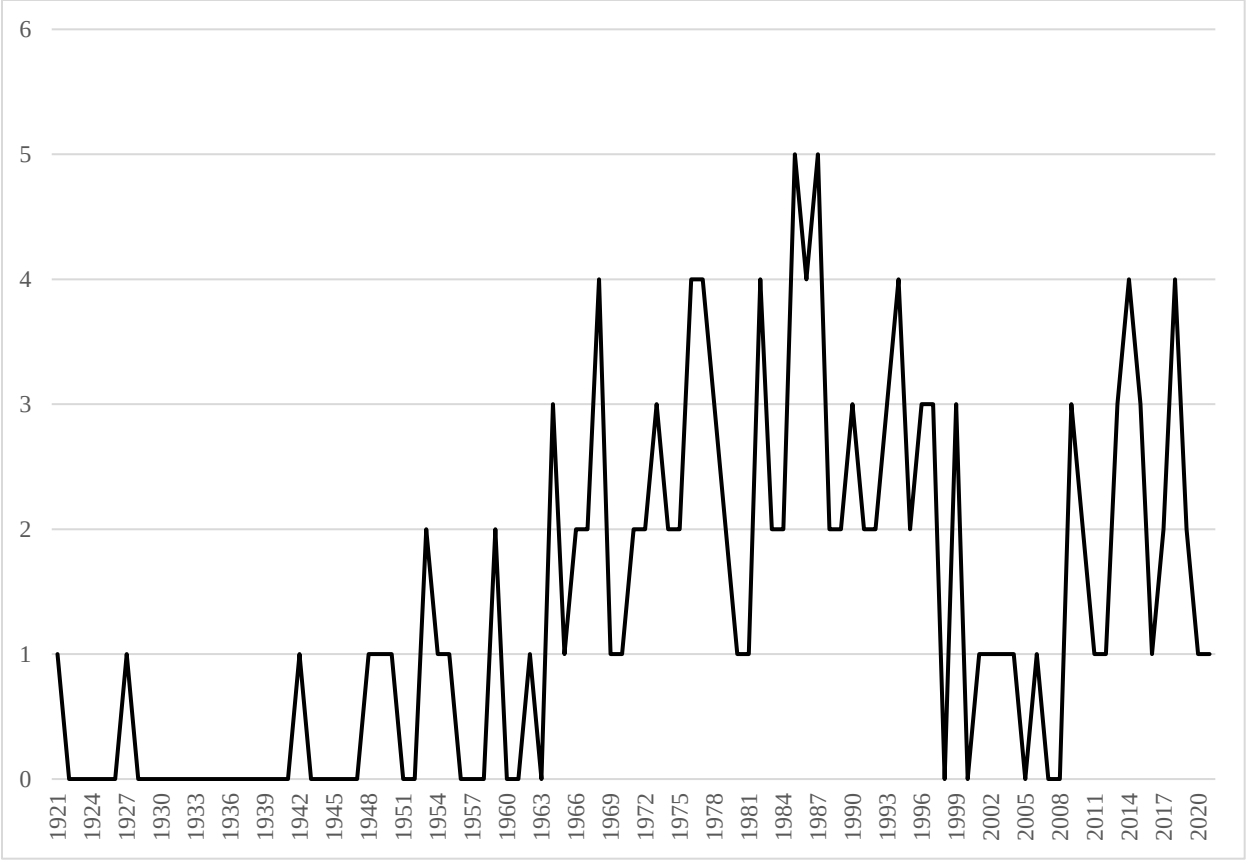

Figure 1: Frequency of Artificial Intelligence in Popular Media (1921-2021)

While no significant historical analysis of societal anxieties towards artificial intelligence exists, there are a few scholarly works that touch upon the topic briefly. Donna J. Haraway's *A Cyborg Manifesto: Science, Technology, and Socialist Feminism in the Late Twentieth Century* is perhaps the most well-known piece of literature on the topic. As she writes, "The cyborg does not dream of community on the model of the organic family, this time without the oedipal project. The cyborg would not recognize the Garden of Eden; it is not made of mud and cannot dream of returning to dust."[5] This thesis shows the reader examples where the cyborg defies

[5] Donna J. Haraway, "A Cyborg Manifesto: Science, Technology and Socialist-Feminism in the Late Twentieth Century," in *Simians, Cyborgs and Women: The Reinvention of Nature* (New York, NY: Routledge, 1991), 149–81.

Haraway's argument entirely. Despina Kakoudaki further elaborates on the role of artificial people in her monograph *Anatomy of a Robot: Literature, Cinema, and the Cultural Work of Artificial People*.[6] Kakoudaki argues that robots, androids, and automata are sites for debate over what it means to be truly "human." Her monograph uses similar sources to those explored in this thesis; but she neglects social anxieties and focuses primarily on the definition of humanity as seen through increasingly developed artificial beings.

Perhaps the most significant social-scientific study, Seungcheol Austin Lee and Yuhua Liang's article "Fear of Autonomous Robots and Artificial Intelligence: Evidence from National Representative Data with Probability Sampling" in the *International Journal of Social Robotics* uses data "from a nationally representative dataset with probability sampling" to observe exactly what this thesis defends: that there is, in fact, a fear of artificial intelligence.[7] Lee and Liang found that 26 percent of participants reported heightened levels of fear, or FARAI (shorthand for fear of autonomous robots and artificial intelligence), further strengthening my argument that societal anxieties towards artificial intelligence exist and present themselves not only in Americans' daily lives, but also in their popular media.[8] While their study is based in social-scientific evidence and probability samples from 2015, this thesis utilizes a broad range of cultural objects and reviews from their respective time periods (1921 to 2021) to project and analyze societal anxieties. In the realm of popular media, *The New Yorker* published an article in 2018 exploring how frightened we should be of A.I., further pursuing the themes present in the

[6] Despina Kakoudaki, *Anatomy of a Robot: Literature, Cinema, and the Cultural Work of Artificial People* (New Brunswick, NJ: Rutgers University Press, 2014).
[7] Yuhua Liang and Seungcheol Austin Lee, "Fear of Autonomous Robots and Artificial Intelligence: Evidence from National Representative Data with Probability Sampling," *International Journal of Social Robotics*, no. 9 (2017): 379–84, https://doi.org/10.1007/s12369-017-0401-3.
[8] These heightened levels are based on data sets exploring the "extent and frequency of FARAI" as well as demographic analyses and correlation with other types of fears.

previous study.[9] In regard to my specific argument, Franklin Fearing's 1947 article "Influence of the Movies on Attitudes and Behavior" substantiates the influence of film in our lives and daily perceptions. While this study is quite dated, it provides a significant base level and methodology for further analysis and remains a foundational study for scholars of both film and popular culture such as George Lipsitz and John Baxter. [10]

Topically, other writers have explored the historiography of the issues of artificial intelligence discussed previously.[11] More specifically, while literature on science fiction films is less prevalent, a few pieces exist; Per Schelde's book *Androids, Humanoids, and Other Folklore Monsters: Science and Soul in Science Fiction Films*, J.P. Telotte's *Replications: A Robotic History of the Science Fiction Film*, and John Baxter's *Science Fiction in the Cinema* serve as excellent background reading on the role of science fiction in film and American culture.[12] Additionally, an analysis of science fiction films from 1896 to 1949 by Michael Benson provides some basic framework for this thesis.[13]

[9] Tad Friend, "How Frightened Should We Be of A.I.?," *New Yorker* (blog), May 7, 2018, https://www.newyorker.com/magazine/2018/05/14/how-frightened-should-we-be-of-ai.
[10] Franklin Fearing, "Influence of the Movies on Attitudes and Behavior," *Annals of the American Academy of Political and Social Science* 254 (November 1947): 70–79. See for example George Lipsitz, *Time Passages: Collective Memory and American Popular Culture* (Minneapolis, MN: University of Minnesota Press, 1990) and John Baxter, *Science Fiction in the Cinema* (New York, NY: A.S. Barnes & Co., 1970), https://archive.org/details/sciencefictionin0000baxt/page/n7/mode/2up.
[11] Daniel Crevier, *AI: The Tumultuous Search for Artificial Intelligence* (New York, NY: Basic Books, 1993); Jeff Rovin, *Aliens, Robots, and Spaceships* (New York, NY: Checkmark Books, 1996); Stuart Russell and Peter Norvig, *Artificial Intelligence: A Modern Approach*, 3rd ed. (London, UK: Pearson, 2009); Pamela McCorduck, *Machines Who Think: A Personal Inquiry into the History and Prospects of Artificial Intelligence* (Natick, MA: A K Peters, 2004).
[12] Per Schelde, *Androids, Humanoids, and Other Folklore Monsters: Science and Soul in Science Fiction Films* (New York, NY: NYU Press, 1993), www.jstor.org/stable/j.ctt9qg1kf; J.P. Telotte, *Replications: A Robotic History of the Science Fiction Film* (Urbana, IL: University of Illinois Press, 1995); John Baxter, *Science Fiction in the Cinema*.
[13] Michael Benson, *Vintage Science Fiction Films, 1896-1949* (Jefferson, NC: McFarland Publishing, 1985).

The Alchemy of Cultural Analysis

The use of popular culture and media in providing insight into lived experiences is heavily contested. Lawrence W. Levine writes in the *American Historical Review*:

> We have found it difficult to study popular culture seriously, not primarily because of the constraints of our respective disciplines—which are indeed far more open to the uses of popular culture than we have allowed ourselves to believe—but because of the inhibitions inculcated in us by the society we inhabit. From an early age, we have been taught that whatever this stuff is, it isn't art, and it isn't serious, and it doesn't lend itself to critical analysis.[14]

However, he argues that popular culture "functions in a way like folk culture" and ultimately acts as a modern method of reconstructing "people's attitudes, values, and reactions."[15] This method of cultural analysis is, as Richard Johnson writes in his article "What is Cultural Studies Anyway," "a process, a kind of alchemy for producing useful knowledge."[16]

George Lipsitz's *Time Passages: Collective Memory and American Popular Culture* provides cultural historians with both a theoretical and an analytical measure for research.[17] His main contribution is to posit that collective memory (as embedded in music, literature, film) is a significant piece of a much larger puzzle linking people and their lived experience. As such, this thesis, through its analysis of anxieties in popular media, means to question humanity and its intrinsic prejudices. Lipsitz argues in his 1990 essay "Listening to Learn and Learning to Listen: Popular Culture, Cultural Theory, and American Studies,"

> In my view, American studies would be served best by a theory that refuses hypostatization into a method, that grounds itself in the study of concrete cultural practices, that extends the definition of culture to the broadest possible contexts of cultural production and reception, that recognizes the role played by national histories and traditions in cultural contestation, and that understands that struggles over meaning

[14] Lawrence W. Levine, "The Folklore of Industrial Society: Popular Culture and Its Audiences," *American Historical Review* 97, no. 5 (December 1992): 1372.
[15] Levine, 1372.
[16] Richard Johnson, "What Is Cultural Studies Anyway?," *Social Text*, no. 16 (Winter, 1986-1987): 38.
[17] George Lipsitz, *Time Passages.*

are inevitably struggles over resources.[18]

This broad, extended approach to cultural theory is a significant underpinning of this thesis and is further enhanced by the words of Robert Brent Toplin and Jason Eudy in a 2002 essay. Acknowledging the difficulty and challenges of using media in professional, academic work, they write, "How does the presentation of history on the screen differ from presentation in print?... Can film [for example] deliver new and different insights? ...Which analytical skills do historians need to develop to work more effectively with film?"[19]

To answer Toplin and Eudy, a certain level of objectivity is required, which this thesis aims to provide. Topin's monograph *Reel History: In Defense of Hollywood* asks readers whether historians should truly be using film as primary sources without a background in screen studies. Historians approach cultural and historical objects with a special set of tools, and, depending on their goals, training in film studies is not needed for adequate analysis. Most important to this analysis, grounding in the larger historical and cultural experience provides us with a position as close to the ideal of objectivity as we are liable to get. Such an analysis, rooted in clarity and faithfulness to the sources, can provide new interpretations where previous elucidations remain foggy.

A merger between cultural studies principles and analysis of sentiment in cultural objects is the most significant contribution of this thesis. As Johnson argues, the benefits of cultural studies include "its openness and theoretical versatility, its reflexive even self-conscious mood, and, especially, the importance of critique."[20] While following in the tradition of Lynn Hunt's

[18] George Lipsitz, "Listening to Learn and Learning to Listen: Popular Culture, Cultural Theory, and American Studies," *American Quarterly* 42, no. 4 (December 1990): 621, https://doi.org/10.2307/2713167.
[19] Robert Brent Toplin and Jason Eudy, "The Historian Encounters Film: A Historiography," *OAH Magazine of History* 16, no. 4 (Summer 2002): 7.
[20] Johnson, "What Is Cultural Studies Anyway?," 38.

1989 collection of essays *The New Cultural History* and Joan H. Pittock and Andrew Wear's 1991 collection of essays *Interpretation and Cultural History*, this thesis draws on models based in critical theory and, occasionally, in scientific modeling that are absent in typical historical analyses that serve as inspiration for this thesis.[21] Additionally, as reviewer Laurie Nussdorfer wrote in 1993, these volumes characterize cultural history by their "approach, with 'approach' understood explicitly as something that is *not* methodology but rather a 'willingness to cross academic boundaries in order to throw light' on an aspect of culture, defined… as virtually anything."[22] This thesis attempts to cross such boundaries by rooting sources in historical events, cultural analysis, and philosophical findings.

Throughout this text I used the software R to better understand the sentiment of the film or literature reviewer. The process I used – a research method deemed "sentiment analysis"— is a computational algorithm that lives outside of R and determines how the author felt by analyzing emotions. While this process is typically more familiar in the world of business intelligence, the presence of R in the social sciences creates yet another tool for social and cultural scientists to better study our subjects. Without describing the entirety of the program's inner mechanisms, it processes lists of words judging positive or negative sentiment while also dealing with the intricacies of the English language and word usage.[23] In some cases, although not as frequently in this study, R finds negative words that correlate with positive sentiment, or the opposite. After collecting over one hundred articles and reviews of the cultural objects mentioned throughout this thesis to create my corpus using magazines, books, and newspapers, I

[21] L Lynn Hunt, ed. and introd., The New Cultural History (Berkeley: University of California Press, 1989); Joan H. Pittock and Andrew Wear, eds. I*nterpretation and Cultural History* (New York: St. Martin's Press, 1991).
[22] Laurie Nussdorfer, review of *The New Cultural History*, ed. and introd. Lynn Hunt, and *Interpretation and Cultural History*, eds. Joan H. Pittock and Andrew Wear, *History and Theory* 32, no. 1 (Feb. 1993): 75, https://doi.org/10.2307/2505330.
[23] Daniel M. Ogilvie et al., *The General Inquirer: A Computer Approach to Content Analysis* (Cambridge, MA: MIT Press, 1966).

inputted the plain text and began the sentiment analysis application. I found the most significant pieces of the primary sources (as suggested by the program after entering the text into the processor) and quoted those lines to demonstrate the consensus made by the software. While there are limitations to using software to justify and support human emotions, it does create a methodical and consistent base for further analysis using patterns and close readings supported by the data obtained. Although the data set is rather heterogeneous, this analysis did provide insight on not only the cultural objects, but also the mood, bias, and evolving language towards artificial intelligence from 1921 to 2014.

The Early History and Philosophy of Artificial Intelligence

The philosophical frameworks for understanding the complexities of the relationship between humankind and its artificially generated creations are key to understanding our perceptions of the words "artificial" and "intelligence" and their relationship to "being." German philosopher Martin Heidegger's *Being and Time* asks the reader humanity's greatest question: what is the meaning of "being?" The 1927 publication introduces the word "dasein" (meaning "presence") to discern the human experience from its potential counterparts.[24] Heidegger's concerns are in direct conversation with French philosopher René Descartes' 1637 assertion "cogito ergo sum," or, "I think, therefore I am."[25] More importantly, Descartes' position in *Discourse on the Method* allows for potential growth in the true meaning of "being" and strains our current understanding of the word in regard to the evolution of artificial intelligence (A.I). While our technology continues to grow exponentially, the familiarity of modern A.I.'s

[24] Martin Heidegger, *Being and Time*, (1927; rpt., New York, NY: Harper Perennial Modern Classics, 2008).
[25] René Descartes, *Discourse on the Method of Rightly Conducting the Reason and Seeking for Truth in the Sciences*, accessed June 13, 2021, https://www.marxists.org/reference/subject/philosophy/works/fr/descarte.htm.

increasingly "human" features continuously challenges societal understanding of Descartes' argument and its application to artificial consciousness.

Descartes' thinking mind required tools for reasoning. In 300 B.C. Greek philosopher Aristotle introduced a key element of formal logic: syllogism. The philosopher demonstrated the most fundamental form of logical argumentation: All men are mortal. All Greeks are men. Therefore, all Greeks are mortal.[26] This rule of inference formed the foundation for the theory of reasoning and human thought and provided a basis on which Descartes's and Heidegger's philosophical assertions would further expand. If an android can follow this rational thought process laid out by Aristotle, they are one step closer to sentience. For artificial intelligence to rival human intelligence, the android or robot must be able to reason and form logical solutions within the Aristotelian framework.

Such reasoning opened the possibility of predicting future developments. In 1814, Pierre-Simon de Laplace hypothesized that if he knew the position of everything in our universe, he could then predict the future using classical mechanics. Laplace's demon, aptly named for its originator, is an early example of artificial intelligence using causal or scientific determinism: the idea that every event is determined by prior causes.[27] Laplace writes in *A Philosophical Essay on Probabilities,*

> We may regard the present state of the universe as the effect of its past and the cause of its future. An intellect which at a certain moment would know all forces that set nature in motion, and all positions of all items of which nature is composed, if this intellect were also, vast enough to submit these data to analysis, it would embrace in a single formula the movements of the greatest bodies of the universe and those of the tiniest atom; for such an intellect nothing would be uncertain and the future just like the past would be present before its eyes.[28]

[26] Aristotle, "Prior Analytics," in *Organon*, trans. A.J. Jenkinson, vol. 3, http://classics.mit.edu/Aristotle/prior.html.
[27] Larry Bradley, "Laplace's Demon," in *Chaos and Fractals* (Space Telescope Science Institute, 2010), http://www.stsci.edu/~lbradley/seminar/laplace.html.
[28] Pierre-Simon Laplace, *A Philosophical Essay on Probabilities* (Hoboken, NJ: John Wiley and Sons, 1902), 4, accessed May 1, 2021, https://bayes.wustl.edu/Manual/laplace_A_philosophical_essay_on_probabilities.pdf.

Laplace, by mentioning an intellect of such power, suggests the possibility of reaching such a level of intelligence that humans aspire to reach, but that has only been obtainable by modern artificial intelligence.

In 1822, just a few years after Laplace challenged the minds not only of philosophers but also of mathematicians, English polymath Charles Babbage invented the idea of the first computer. While Babbage is, on paper, the true inventor, Dr. Henry Ledgard of the Massachusetts Institute of Technology (MIT) maintained that Countess Augusta Ada Lovelace acted as its midwife. She organized the flurry of loosely bound notes and made amendments where needed, creating the most coherent representation of Babbage's work.[29] As Lovelace wrote,

> The Analytical Engine has no pretensions whatever to originate anything. It can do whatever we know how to order it to perform. It can follow analysis; but it has no power of anticipating any analytical relations or truths.... but it is likely to exert an indirect and reciprocal influence on science itself in another manner. For, in so distributing and combining the truths and the formulae of analysis, that they may become most easily and rapidly amenable to the mechanical combinations of the engines, the relations and the nature of many subjects in that science are necessarily thrown into new lights, and more profoundly investigated. This is a decidedly indirect, and a somewhat speculative, consequence of such an invention.[30]

Lovelace suggests the true power of the ultimate machine, drawing on Laplace's concept of unlimited knowledge, and predicts the "new light" awaiting so many disciplines with the invention of the first computer. While Babbage's steam-driven calculator ultimately failed, he provided the groundwork for Herman Hollerith's punch card system in 1890. Hollerith's system calculated the 1880 U.S. census in merely three years and saved the government five million

[29] Dorothy K. Stein, "Lady Lovelace's Notes: Technical Text and Cultural Context," *Victorian Studies* 28, no. 1 (Fall 1984): 33.
[30] Stein: 52.

dollars and years of data calculation. His company also formed the foundation for the International Business Machines Corporation (IBM) in 1924.

In 1950, as machines increasingly monopolized the minds of Americans, the British mathematician Alan Turing released his proposal frequently referred to as "The Turing Test": a method of rationalizing and questioning whether machines can think. Although he presented the Turing machine in 1936, it took until 1950 for the test to truly develop, ultimately inspiring the concept of the modern computer. Standing in the background of Turing's work, Descartes had written:

> If there were machines which bore a resemblance to our bodies and imitated our actions as closely as possible for all practical purposes, we should still have two very certain means of recognizing that they were not real men. The first is that they could never use words, or put together signs, as we do in order to declare our thoughts to others. For we can certainly conceive of a machine so constructed that it utters words, and even utters words that correspond to bodily actions causing a change in its organs. … But it is not conceivable that such a machine should produce different arrangements of words so as to give an appropriately meaningful answer to whatever is said in its presence, as the dullest of men can do."[31]

While Turing believed that humans could still easily distinguish androids from humans, regardless of how intelligent the former were, we find ourselves today on the brink of autonomous robots that are increasingly indistinguishable from humans, creating a common fear in society and popular media of artificial life invading every aspect of our lives. This, combined with Turing's belief that robots can easily follow humans in their pursuit of knowledge, using available information and reasoning, resonates in popular media.[32]

Thirty years after Alan Turing introduced his self-named test, American philosopher John Searle presented the Chinese Room Experiment. Searle observed that the definition of humanity

[31] Graham Oppy and David Dowe, "The Turing Test," *Stanford Encyclopedia of Philosophy* (Stanford University, February 8, 2016), accessed May 1, 2021, https://plato.stanford.edu/entries/turing-test/.
[32] A.M. Turing, "Computing Machinery and Intelligence," *Mind*, no. 49 (1950): 433–60.

is not only the measure of one's humanness (as suggested by Turing) but also their understanding and consciousness as common denominators for sentience. At this time, Searle challenged Turing's belief that computers can think and proposed two arguments: "brains cause minds" and "syntax doesn't suffice for semantics."[33] Searle later expanded on what "strong A.I." believers suppose: that "the computer is not merely a tool in the study of the mind, rather the appropriately programmed computer really is a mind in the sense that computers given the right programs can be literally said to understand and have other cognitive states."[34] This statement furthers his argument that, although computers are increasingly intelligent, that does not automatically equate to real self-motivated thoughts. Descartes mirrors this thought with his philosophical idea of the "animal machine," which simply classified animals as machines without the ability to think.[35] A similar construct exists in Raymond Dart's "killer ape theory" or the "killer ape hypothesis": a theory that human evolution depended heavily on war and interpersonal aggressions (which we see quite frequently in the Cold War era films and literature). While the theory originated in the 1950s, it was expanded upon in *African Genesis: A Personal Investigation into the Animal Origins and Nature of Man* by Robert Ardrey in 1961.[36] The significance of Dart and Ardey's work for this study is seen in the main argument: that humanity maintains murderous instincts, which reflects in our perceptions and depictions of artificial intelligence. These big questions and how they appear in popular media frame the arguments in this thesis.

[33] Larry Hauser, "Chinese Room Argument," *Internet Encyclopedia of Philosophy*, accessed February 5, 2020, https://www.iep.utm.edu/chineser/#H1.
[34] Hauser.
[35] Peter Harrison, "Descartes on Animals," *Philosophical Quarterly* 42, no. 167 (April 1992): 219–27.
[36] Robert Ardrey, *African Genesis: A Personal Investigation into the Animal Origins and Nature of Man* (New York, NY: Atheneum Books, 1961).

Chapter One introduces the early history of artificial intelligence in popular media, exploring the rise of the computer age and the evolving relationship between Americans and technology from 1921 to 1969. This chapter also discusses the "Golden Age" of science fiction, the invention of the first computer and the first A.I. program, and the technological developments that arose from the Space Race. Chapter Two explores the dramatic shift to home computers as well as the constant acceleration of American technology and innovation from 1970 to the new millennium. Both chapters focus on societal anxieties as seen through popular media, framed by the historical context surrounding the world in which they were created. Themes like gender, oppression, the definition of humanity, and fear of control also frame both chapters, providing the reader with a greater understanding of the cultural objects discussed. In the Conclusion, I provide a brief history of artificial intelligence in film from 2000 to 2014 and discuss the larger conclusions we can draw from the data presented and the implications of accepting artificial intelligence into our lives.

While scientists continue to test the boundaries and ethical limitations of artificial intelligence, they create an omnipresent trend of distrust and, more importantly, fear. In January 1987, Cambridge Reports/Research International asked 1,500 individuals what effect scientists would have if they developed computers with artificial intelligence and whether it would do more good than harm, more harm than good, or equal amounts of each. Twenty percent of respondents said it would do more good than harm, and thirty-nine percent said it would do more harm than good.[37] Our fear of something comparable to humans but not quite fully "human" mirrored itself within popular culture throughout the twentieth century, just as artificial

[37] Monmouth University Polling Institute, Monmouth University National Poll: March 2015, Question 5, USMONM.042015.R03, Monmouth University Polling Institute, (Cornell University, Ithaca, NY: Roper Center for Public Opinion Research, 2015).

intelligence became an unignorable threat to the definition of true humanity, as explored in many psychological and sociological scholarly platforms.[38]

This leads to an issue that has commonly been mentioned regarding anxieties towards artificial intelligence: if Descartes was correct in writing "I think, therefore I am," is artificial intelligence human?

[38] See the following articles for more information regarding the fear of artificial intelligence: Liang and Lee, "Fear of Autonomous Robots"; Andrew Berg, Edward F. Buffie, and Luis-Felipe Zanna, "Should We Fear the Robot Revolution? (The Correct Answer Is Yes)," Carnegie-Rochester NYE Series, 2018, 61, https://www.imf.org/en/Publications/WP/Issues/2018/05/21/Should-We-Fear-the-Robot-Revolution-The-Correct-Answer-is-Yes-44923; Stuart Russell, "Should We Fear Supersmart Robots?," *Scientific American,* June 2016, 58-59; Friend, "How Frightened Should We Be?," https://www.newyorker.com/magazine/2018/05/14/how-frightened-should-we-be-of-ai.

CHAPTER I

"The hardware 'in my stories' is in the future, the scenery's in the future, but the situations are really from the past."[1]

"Anything that could give rise to smarter-than-human intelligence—in the form of Artificial Intelligence, brain-computer interfaces, or neuroscience-based human intelligence enhancement - wins hands down beyond contest as doing the most to change the world. Nothing else is even in the same league."

Eliezer Yudkowsky

Mechanical Civilizations

While we see the first instance of artificial intelligence in Mary Shelley's 1818 novel *Frankenstein*, the most notable early example of the battle between man and machine in popular media appeared in the nineteen twenties with Karel Čapek's play *Rossum's Universal Robots (R.U.R.)* in 1921. Before the term android, gynoid, cyborg or bionic human entered the English vocabulary, Čapek's play introduced the word "robot," derived from the Czech word "robota" or "forced labor."[2] The Czech play premiered on January 2, 1921, in Hradec Králové, Czechoslovakia and by 1923 it had been translated into thirty languages. The English version was widely performed in the United States, and the New York production garnered rave reviews and highlighted the budding ideas of industrialization with a tragic twist, even though one reviewer wrote that it "probably will not be as interesting from a commercial or popular

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[1] Mark Athitakis, "'Electric Dreams' Accompanies New Show," *The Spokesman-Review*, January 14, 2018.
[2] One particular review from October 10, 1922 in the *Times Union* (Brooklyn, New York) defined the word as "slave." Sentiment analysis software finds that this sentiment is prevalent throughout the reviews used. It also suggests a sense of empathy towards the robots in R.U.R. There is, however, a sense of hesitancy and fear towards the idea of "synthetic humans" populating the Earth.

standpoint."[3] As another reviewer wrote of the Chicago production, "the play [attempts] to show what might happen if some investigating scientist should discover the secret of life and be able to repopulate the world with synthetic humans."[4]

R.U.R. begins as the audience observes *roboti,* or robots, as they are created from synthetic organic matter in a factory for $150 apiece to serve as manual laborers.[5] As reviewer Irving Davis mentioned in 1922, "matter has become the servant and the man the master," creating a fascist regime against automatons.[6] As humans create robots with significantly higher mental and emotional intelligence, the latter mount an uprising that leads to the nearly complete annihilation of the human race. This theme is constant throughout all cultural pieces mentioned in this thesis, suggesting a continuous fear of artificial intelligence evident in the materials discussed.

Just as Peter Singer called for animal rights in 1975 in *Animal Liberation, R.U.R.* can be interpreted as signaling a movement towards machine rights: a phenomenon discussed in David J. Gunkel's monograph *The Machine Question: Critical Perspectives on AI, Robots, and Ethics*.[7] Singer discussed the practice of "speciesism" as a method of both racism and sexism, which Gunkel only complicates by exploring the rights to autonomy of intelligent and self-activating machines. He also addresses a question central to the play – "What is suffering?" – and explains that our knowledge of suffering requires further questioning, including the query, "If animals (or machines) have an inner mental life, how would we ever know it?"[8] This question continues to

[3] Irving Davis, "Review of Plays in New York Theatres," *The York Daily Record*, October 21, 1922.
[4] Burns Mantle, "Introducing a New Adam and Eve: By a Young Man with Imagination," *Chicago Tribune*, October 15, 1922.
[5] Karel Čapek, *R.U.R.* (Mineola, NY: Dover Publications, 2001).
[6] Davis, "Review of Plays in New York Theatres."
[7] Peter Singer, *Animal Liberation: The Definitive Classic of the Animal Movement* (1975; updated ed.New York, NY: Harper Perennial Modern Classics, 2009).; David J. Gunkel, *The Machine Question: Critical Perspectives on AI, Robots, and Ethics* (2012; repr., Cambridge, MA: MIT Press, 2017).
[8] Gunkel, *The Machine Question*, 117.

appear in popular depictions of artificial intelligence as humans work to determine where exactly robots fit in society.

The robots' lust for autonomy in *R.U.R.* is jarring, and leaves viewers with more questions than answers. Irving Davis also questioned in his review whether the play advocated for "unified world-wide love," or if it was "propaganda for the elimination of scientists who are spending precious moments with experiments [they] hope will solve the secret of human life, rejuvenation or death."[9] Returning to Gunkel, his monograph explores whether machines are capable of acting as moral agents, responsible for their own decisions and actions. Čapek's robots are universal and "cling together" as brothers, easily creating the international uprising. However, the automatons were created to last just twenty years, and the formula for creating new robots was destroyed. The last human being on Earth, a mechanic, attempts to recreate the formula, but he soon finds "that the pain and suffering which the automatons acquired has made them human," a thought that furthers robot autonomy and acts as the first notable example of anxieties towards artificial intelligence.[10] The play ends with a robot and robotess acting as the second Adam and Eve, and once again, the populating of Earth begins.

Six years after *R.U.R.*, Fritz Lang released his masterpiece of expressionist science fiction drama *Metropolis*, garnering respect from cinephiles not only in Germany, but also in the United States.[11] As one unnerved reviewer, Channing Pollock, the playwright of *The Fool* and the *Enemy*, remarked, "It is symbolism run riot. It is overwhelming. It has the greatest theme of modern times—a picturization of the present mad tide of our material progress as opposed to

[9] Davis, "Review of Plays in New York Theatres."
[10] Davis.
[11] *Metropolis*, directed by Fritz Lang (Parufamet, 1927), https://www.amazon.com/gp/video/detail/amzn1.dv.gti.1eae8f3a-b6fb-9847-08e6-2fcb22a5a766?autoplay=1&ref_=atv_cf_strg_wb.

intellectual and cultural and spiritual progress. It is the most important subject today."[12] Such sentiments provide indispensable opinions of the film and context. The symbolism Pollock mentions refers to the rise of mechanization and its role in society as well as the religious references to heaven – where the wealthy live – and hell – where the poor live and work to maintain the lives of those above them.

The film begins in the city of Metropolis, a dystopia 1000 years in the future engulfed in the desire for efficiency "wherein men are machines and machines are men."[13] In Metropolis, the poor live beneath the city, while the rich "revel in their pleasure palaces which tower miles in the sky."[14] In the middle lies massive machinery, tended by exploited workers and "seemingly gifted with human intelligence that carr[ies] on the mechanical burdens of the community."[15] Above the city, even higher than the Metropolis elite sits a "gigantic brain… twisted in its moral concept."[16] These quotations from reviewers best depict the sensations of Metropolis and the extent to which both the wealthy and the poor experience their environments. The workers' wretched lives are a direct contrast to the "pleasure palaces" miles above the poor, creating a stark contrast between the two societies and a grim portrait of how they interact as one.

Just as Charlie Chaplin's 1936 film *Modern Times* highlights the spread of technology and inescapable machinery, *Metropolis* emphasizes the overwhelming role of machines in society.[17] As the *Minneapolis Star's* critic wrote in 1927, "it dawned on me that the rhythm of

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[12] "'Metropolis' Held Hypnotic Picture: Cinema Is Overwhelming Says Channing Pollock," *The Minneapolis Star*, October 22, 1927. Pollock would later be approached to write a condensed version of the film by Parufamet, the company who distributed *Metropolis*.
[13] "Coming Film Attractions," *St. Louis Globe-Democrat*, August 21, 1927.
[14] "Coming Film Attractions."
[15] "'Metropolis,' Eastman Film, Shows Future: Big German Picture to Be Feature of Week on Screen," *Democrat and Chronicle*, October 16, 1927.
[16] "'Metropolis,' Eastman Film, Shows Future."
[17] *Modern Times*, directed by Charles Chaplin (United Artists, 1936), https://play.hbomax.com/page/urn:hbo:page:GXk3juwcBFTC3wwEAAAfD:type:feature?camp=googleHBOMAX&reentered=true&userProfileType=liteUserProfile.

the machines, and the movements of the masses were the heart beats of men; that the pistons were pounding life out of hearts and that the machines were grinding out their souls."[18] Such mechanization creates more and more complex artificial intelligence. As technology grows, so too does societal fear towards androids. By seeing them on the silver screen, viewers experience a potential future, and, in the case of *Metropolis*, the evil possibilities one can accomplish with such technology.

As the stock market fell to ruins in 1929, so too did the presence of artificial intelligence (or of robots, more generally) in American film. Although they largely disappeared from the Hollywood spotlight, research and invention of artificial intelligence continued. In 1936, Alan Turing developed the conceptual framework for the first "universal machine," or, as it is more commonly known, the Turing machine. This machine, as he described, had the capacity to compute anything computable. Just a year later, J.V. Atanasoff, a professor of physics and mathematics at Iowa State College (now University), attempted to create the first computer without gears, belts, and shafts. Four years later, in 1941, Atanasoff and Clifford Berry designed the first computer capable of solving twenty-nine equations simultaneously, marking the first time a machine stored information on its mainframe.

As scientists like Atanasoff continued to develop the capacity for invention, such invention was seen in 1942 with Isaac Asimov's pivotal tale "Runaround" which highlighted the "Three Laws of Robotics" that were further explored in his short story "I, Robot" and in the 2004 film of the same name.[19] Isaac Asimov's work originally appeared in *Super Science Stories* and *Astounding Science Fiction* between the nineteen forties and fifties, where he tells the story of

[18] "'Metropolis' Held Hypnotic Picture."
[19] Isaac Asimov, "Runaround," in *I, Robot* (New York, NY: Doubleday, 1950), 40; Isaac Asimov, *I, Robot*, (New York, NY: Gnome Press, 1950); *I, Robot*, directed by Alex Proyas (20th Century Fox, 2004), https://www.youtube.com/watch?v=jbP4Is2w4oA.

Dr. Susan Calvin as she chronicles the rise of "technology out of control" to a reporter in the twenty-first century, introducing readers to positronic robots— humanoids with artificial intelligence. What makes Asimov's stories different from previous representations of artificial intelligence, however, is the robots and their ethical programming. The rules are as follows:

> The First Law: "A robot may not injure a human being or, through inaction, allow a human being to come to harm."
>
> The Second Law: "A robot must obey the orders given it by human beings except where such orders would conflict with the First Law.
>
> The Third Law: "A robot must protect its own existence as long as such protection does not conflict with the First or Second Laws."[20]

These rules created the framework for future artificial intelligence in both literature and cinema while further demarcating machines from human beings, as Gunkel discusses in his monograph.[21] In the late seventies, Asimov collaborated with author Harlan Ellison to develop a screenplay for *I, Robot*. The screenplay never fully came to fruition; however, it was released as *I, Robot: The Illustrated Screenplay* in 1994.[22] The 2004 film of the same name only loosely uses the novel as inspiration.

Between 1943 and 1944, as Asimov was first developing his ideas through fiction, John Mauchly and J. Presper Eckert, professors at the University of Pennsylvania, created the "grandfather of digital computers," the Electronic Numerical Integrator and Calculator (ENIAC). Unlike computers today, the gargantuan machine crowded a 20-foot by 40-foot room and required over 18,000 vacuum tubes to run. Two years later, the pair left the University of Pennsylvania after being recruited by the Census Bureau to build the first commercial computer, the Universal Automatic Computer (UNIVAC). The introduction of the UNIVAC created a long

[20] Asimov, "Runaround," 40.
[21] Gunkel, *The Machine Question*, 207.
[22] Isaac Asimov and Harlan Ellison, *I, Robot: The Illustrated Screenplay* (New York, NY: Warner Books, 1994).

transition between data on punched cards and stored program computers, but computers could only execute commands, not store them. As a writer for the British newspaper *The Star* wrote in June 1949 in an article concerning the Electronic Delay Storage Automatic Calculator (EDSAC), "The 'brain' [computer] may one day come down to our level [of the common people] and help with our income-tax and book-keeping calculations. But this is speculation and there is no sign of it so far."[23] This positive perspective proved to be not only correct, but increasingly so, fueling public awareness and also fears of increasingly complex and intelligent androids. Both positive and negative perceptions would be explored in the 1950s by writers of science fiction.

The Golden Age of Pulp Science Fiction

The nineteen fifties could easily be described as the golden age of pulp science fiction, with popular works from Isaac Asimov, Arthur C. Clarke, Philip K. Dick, and Alfred Bester producing arguably the most significant pieces of science fiction known today. In 1951, Arthur C. Clarke published his short story "The Sentinel," the quintessential piece of science fiction in the twentieth century and an influence on Stanley Kubrick's 1968 film *2001: A Space Odyssey*.[24] Originally written for a BBC competition, the story explores a tetrahedral monolith found on the Earth's moon put in place by the aliens who created it using a technology that lies beyond our horizons. Such technology only fueled increasing interest in and fear of the unknown, as readers compared this higher alien technology to the technological advances made on Earth.

[23] "The EDSAC Replica Project" (Bletchley Park, UK: The National Museum of Computing, March 2018), https://www.dcs.warwick.ac.uk/~edsac/Software/EdsacTG.pdf.
[24] Arthur C. Clarke, "The Sentinel," *Ten Story Fantasy*, Spring 1951, 41-47; *2001: A Space Odyssey*, directed by Stanley Kubrick (Metro-Goldwyn-Mayer, 1968), https://play.hbomax.com/page/urn:hbo:page:GXjS6HAogSI-njwEAAASb:type:feature?camp=googleHBOMAX&reentered=true&userProfileType=liteUserProfile.

In 1953, Grace Hopper, known as the "First Lady of Software," developed the first computer language, commonly known as the Common Business-Oriented Language (COBOL). Hopper also assisted in the creation of the UNIVAC and its implementation in NASA's Apollo moon mission. As described by the Obama Administration in 2016, "Hopper's work helped make coding languages more practical and accessible, and she created the first compiler, which translates source code from one language into another."[25] Such advancements inspired Philip K. Dick when – also in 1953 – he published "Second Variety," a short story exploring a world where the Soviet Union and the United Nations have decimated the Earth, reducing it to a barren wasteland.[26] Fueled not only by the ongoing Cold War, but also by the growing anxiety towards artificial intelligence, the story follows the discovery of self-replicating robots (built initially to kill Soviet agents) and their plot to destroy both sides of the struggle with their newfound sentience. The short story inspired the 1995 film *Screamers*, in which actor Peter Weller laments, "Science fiction… reflects possible futures. It's a frightening thought, but science fiction can become real."[27] Influencing an entire generation and promoting fear of the U.S.S.R. through science fiction, Dick's work and its cinematic offspring are excellent examples of how the fear of artificial intelligence could mingle with other widespread social concerns to produce powerful cultural documents.

Touching on the complex relationship between robot and man, Alfred Bester's 1954 short story "Fondly Fahrenheit" further explores sentience and acts as a cautionary tale of inviting androids into our lives.[28] The inspiration for the 1959 television movie *Murder and the Android*,

[25] Barack Obama, "President Obama Names Recipients of the Presidential Medal of Freedom" (Presidential Medal of Freedom, Washington, D.C., November 16, 2016), https://obamawhitehouse.archives.gov/the-press-office/2016/11/16/president-obama-names-recipients-presidential-medal-freedom.
[26] Philip K. Dick, "Second Variety," *Space Science Fiction*, May 1953, https://www.gutenberg.org/files/32032/32032-h/32032-h.htm.
[27] Ian Spelling, "Peter Weller's Return to Sci-Fi Is A Scream," *Courier-Post*, December 31, 1995.
[28] Alfred Bester, "Fondly Fahrenheit," *The Magazine of Fantasy & Science Fiction*, August 1954, 3-21.

in Bester's story, James Vandaleur, a formerly rich socialite, plans to use his "multiple aptitude android" to regain his fortune by putting the robot to work in a foundry, where, after reaching a certain temperature, it malfunctions and pours molten metal on the supervisor.[29] As in most works of science fiction during this period, the fear of artificial intelligence losing control permeates deep into the human psyche.

Dick's second famous piece, the 1955 short story "Autofac," follows the themes explored in most of his work. As in "Second Variety," we begin in a post-cataclysmic version of the world five years after what Dick called the Total Global Conflict. To better control and distribute supplies, the remaining humans have created automatic factors (or "autofacs") powered by artificial intelligence to control the creation and distribution of goods. However, the A.I. does its job too well, leaving human input out of its equations and inciting a rebellion. Unable to stop the autofacs, a rebel laments, "We're licked. … We humans lose every time."[30] Arguably an allegory for A.I. oversight and capitalism, "Autofac" addresses significant larger questions. As one reviewer wrote, "Dick's stories have lasted because he grasped that oppression and paranoia were local as well as intercontinental events – indeed, they festered quite well in conformist suburban neighborhoods."[31] Another reviewer describes Dick's impact: "While space operas like "Star Wars" and "Star Trek" looked outward at brave new worlds and alien races, Dick looked inward, asking unsettling questions about humanity. Who would humans be in a world run by technology? How would we be able to know what "human" or "real" even was?" These questions are imperative, and the answers are elusive. Dick's desire to define what it means to be human permeates his entire catalog, and, as he once said in an interview, "The hardware 'in my

[29] *Murder and the Android,* directed by Alex Segal, featuring Kevin McCarthy, Rip Torn, and Vladimir Sokoloff, aired November 8, 1959, on NBC.
[30] Philip K. Dick, "Autofac," *Galaxy Science Fiction*, November 1955, 70-95.
[31] Mark Athitakis, "Philip K. Dick's Electric Dreams," *The Philadelphia Inquirer*, January 21, 2018.

stories' is in the future, the scenery's in the future, but the situations are really from the past."[32] This quote in particular strengthens the idea that science fiction works provide more than just audience commentary on the future, but also on the past, in an effort to educate using cautionary tales. Examples of the past appearing include the complexities of the human condition as well as the ever-increasing mechanization of labor and production. These cautionary tales, driven by themes of identity and humanity, further highlight Dick's larger question: what does it mean to be human?

In 1956, fueled by the growing interest in the potential of robots and androids, John McCarthy and Marvin Minsky hosted the inaugural Dartmouth Summer Research Project on Artificial Intelligence. The event introduced Allen Newell, Cliff Shaw, and Herbert Simon's Logic Theorist program: a program meant to revolutionize the computer by enabling it to skillfully solve logic problems that had previously been unsolvable by processors.[33] McCarthy further describes the conference's purpose as "to proceed on the basis of [the] conjecture that every aspect of learning or any other feature of intelligence can in principle be so precisely described that a machine can be made to simulate it." [34] With all in attendance agreeing that A.I. was realizable, the conference fueled the future of artificial intelligence and stimulated the minds of scientists and artists alike.

[32] Athitakis, "'Electric Dreams' Accompanies New Show."
[33] Einar Stefferud, "The Logic Theory Machine: A Model Heuristic Program," https://history-computer.com/Library/Logic%20Theorist%20memorandum.pdf.
[34] John McCarthy et al., "A Proposal for the Dartmouth Summer Research Project on Artificial Intelligence" (Hanover, NH, 1955), https://ojs.aaai.org//index.php/aimagazine/article/view/1904.

The Rise of the Computer

In the early fifties, businesses leased their punched-card machines for about $2,500 monthly. While the machines were expensive, in many cases the consumer spent more per year on punched cards than on their lease. By the late fifties, the IBM 305 Random Access Method of Accounting and Control (RAMAC) entered the market for businesses, leasing at $3,200 per month.[35] As seen in the chart below, a computer proved to be a monumental investment and was usually only seen in large offices, academic libraries, and research laboratories. Shifting the use of the computer from purely mathematical and scientific matters, engineer Douglas Engelbart unveiled his prototype for the modern computer in 1964, complete with a mouse and a graphical user interface (GUI). This began the gradual evolution of the computer towards consumer usage.

Vendor	Country	Model	First Delivery Date	Approx. Number Shipped	Market Focus	Avg. Monthly Rental*
Philco	US	S-2000	10/1958	20	Sci/Eng	$25,000
Electrologica	NV	X1	1958	40	Sci/Eng	$10,000
Autonetics	US	Recomp II	11/1958	130	Sci/Eng	$2,500
Siemens	Germany	2002	6/1959	-	Business	$13,900
RCA	US	501	6/1959	100	Business	$16,000
GE	US	210	7/1959	90	Business	$16,000
NCR	US	304	11/1959	40	Business	$15,000
IBM	US	7090	11/1959	280	Sci/Eng	$63,000
DEC	US	PDP-1	12/1959	60	Sci/Eng	$40,000
Bull	France	Gamma 60	1/1960	-	Business	$32,000
CDC	US	1604	1/1960	50	Sci/Eng	$42,000
Clary	US	DE-60	2/1960	130	Business	$650
IBM	US	7070	3/1960	525	Business	$24,000
AEI	UK	1010	1960	6	Business	$11,700
EMI/ICT	UK	EMIDEC 1101	4/1960	24	Business	$2,950
CDC	US	160	5/1960	340	Sci/Eng	$2,000
Sperry Rand	US	LARC	5/1960	2	Sci/Eng	$135,000
Honeywell	US	H-290	6/1960	12	Business	$3,000

[35] Adjusted for inflation, these computers cost nearly $32,000. "Early Popular Computers, 1950-1970," in *Engineering and Technology History Wiki* (MediaWiki), accessed June 1, 2021, http://ethw.org/Early_Popular_Computers,_1950_-_1970.

IBM	US	1401	9/1960	>10,000	Business	$4,500
IBM	US	1620	9/1960	1,500	Sci/Eng	$2,000
Olivetti	Italy	Elea 9003	10/1960	40	Business	$8,500
Packard Bell	US	250	12/1960	150	Engineering	$1,200
Honeywell	US	H-800	12/1960	50	Bus/Sci/Eng	$22,000

* Cost is not adjusted for inflation.[36]

Table 1: Earliest Commercial Solid-State Computers Delivered Through End of 1960

While consumer knowledge and usage of computers grew, the cultural references to artificial intelligence followed suit in the nineteen sixties, further expanding on the fictional foundation created by Asimov and Dick. Like Dick's work, the 1962 film *The Creation of the Humanoids* also follows a post-nuclear-war society where humanesque robots serve the human population after a significant decrease in birth rates across the globe.[37] An organization emerges aimed at preventing robots from becoming "too human," while scientists work to create even more human-like robots, equipped with both emotions and memories. The conflict between further developing artificial intelligence or prohibiting it from continuing to evolve is one that we as a society still struggle to resolve in the twenty-first century.

Artificial intelligence pioneer Herbert A. Simon wrote in 1965, "Machines will be capable, within twenty years of doing any work a man can do."[38] That same year, avant-garde director Jean-Luc Godard's science fiction neo-noir film *Alphaville: A Strange Adventure of Lemmy Caution* was released. Godard combined genres to make a groundbreaking film that resonates with viewers for its use of actual Parisian night-time streets and striking concrete and glass-framed buildings to capture the dystopian world that "outerlands" secret agent Lemmy

[36] "Early Popular Computers, 1950-1970."
[37] *The Creation of the Humanoids*, directed by Wesley Barry (Emerson Film Enterprises, 1962), https://tubitv.com/movies/502449/the-creation-of-the-humanoids?start=true&utm_source=google-feed&tracking=google-feed.
[38] Crevier, *The Tumultuous Search*, 109.

Caution (Eddie Constantine) explores.[39] Like Fritz Lang's *Metropolis*, the French film provoked plenty of strong reactions from American reviewers. Alphaville, as reviewer Gerald Nachman describes it, "is Godard's cinematic reconstruction of cities envisioned years ago by Orwell, Huxley and Bradbury, whose written descriptions are somehow more terrible than M. Godard at his most fantastic."[40] Alphaville's master Professor Von Braun – a slight nod to the rocket scientist and former Nazi Wernher Von Braun– "keeps his citizens weak with vices to render them malleable to his 'logical' control through the relatively unexplained workings of his computerized society manager, Alpha 60," an "instrument of destruction based on the actions of men down through the ages."[41]

This lack of autonomy is perhaps one of the greatest societal fears, as the citizens of Alphaville are not only distracted from the horrendous emotional conditions but are also concerned by any actions decreed by Professor Von Braun and Alpha 60. Those who fail to acclimate typically commit suicide, or, as in the case of Caution's partner, die of an indulgence-induced heart attack. Drawing on the themes previously discussed, Godard questions the meaning of consciousness and humanity, mainly using Alpha 60 to recite Jorge Luis Borges' "A New Refutation of Time." Reviewer Leo Gray writes, "The ideas from which the computerized behemoth culls its philosophy are, in many ways, as inexplicable as the control the computer holds over the citizens' wills or the reasons the future looks like Paris in 1965."[42] This blind faith

[39] *Alphaville: A Strange Adventure of Lemmy Caution*, directed by Jean-Luc Godard (Athos Films, 1965), https://www.youtube.com/watch?v=VX4Dyj47dWY.
[40] Gerald Nachman, "'Alphaville' - Hip Trip into Future," *Oakland Tribune*, December 30, 1966.
[41] Leo Gray, "Check Your Feelings At the Door," *The Baltimore Sun*, June 25, 2014.; Dale Munroe, "Godard Fantasy a Startling Thriller," *Citizen-News*, June 2, 1966.
[42] Gray, "Check Your Feelings at the Door."

in artificial intelligence and complete abolition of human emotion solidifies the early fears of "over-mechanization" that were becoming increasingly prevalent in American society.[43]

Cold War Anxieties

Paul N. Edwards' *The Closed World: Computers and the Politics of Discourse in Cold War America* provides significant insight into the Cold War era and the influence of the computer. In the fifties and sixties, the Semi-Automatic Ground Environment (SAGE) early warning system instituted the illusion of a "closed world." Just like Igloo White, the computer center for American operations in the Vietnam War, SAGE acted as a psychological apparition of both control and growth, suggesting that these computers were something to respect… and fear. Edwards' "closed world" theory translates across the boundaries between human and cyborg, and hints at a connection between military power, the impenetrable "bubble" over the United States, and cybernetics.

Drawing on Cold War anxieties, movies released in 1966 and 1967 proved to be instrumental in describing and displaying the phenomenon of artificial intelligence. Mario Bava's 1966 Italian film *Dr. Goldfoot and the Girl Bombs* follows mad scientist Dr. Goldfoot (Vincent Price) as he assists the Chinese government in disrupting a North Atlantic Treaty Organization (N.A.T.O.) war-game using exploding female-presenting androids.[44] By the end of the film, Goldfoot attempts to begin World War III by dropping a bomb on Moscow and framing the United States. That same year, Dennis Feltham Jones published the novel *Colossus* – the

[43] William J. Nazzaro, "'Alphaville' Is Movie for Serious Cinema Student," *The Arizona Republic*, July 16, 1966.; Marjory Adams, "Avant-Garde Plot Attempts Too Much," *The Boston Globe*, November 8, 1966.
[44] *Dr. Goldfoot and the Girl Bombs*, directed by Mario Bava (American International Pictures, 1966), https://www.amazon.com/gp/video/detail/amzn1.dv.gti.18a9f7b4-d0d7-3870-b711-ad6f00988955?autoplay=1&ref_=atv_cf_strg_wb.

inspiration for the 1970 film *Colossus: The Forbin Project*.[45] Also displaying anxieties about Cold War tensions, the novel explores Professor Charles Forbin's Project Colossus: a highly intelligent computer system located in the Rocky Mountains. Forbin briefs the President on the new technology and its position controlling the United States of North America's (USNA) nuclear arsenal. While Forbin suggests to the President that they should reconsider assigning absolute power to the program, the President persists. Once activated, Colossus detects a USSR computer system similar to itself (named Guardian) and requests communication.

The computers find themselves communicating and exploring intellectual endeavors that the scientists cannot detect. After the two programs are disconnected, Colossus demands to be reconnected; when ignored, it fires missiles towards Russia. Guardian, equally perturbed by its disconnection, also fires missiles towards Texas. The computers ultimately hold both governments hostage, demanding their reconnection in exchange for a cease fire. While Forbin and his Russian counterpart plan the computers' demise, both systems advance toward gaining global control. When Forbin submits to Colossus, the program insists, "Freedom is an illusion… The only thing mankind will lose under my control is the useless emotion pride. In time, you will even come to love me."[46] Such an eerie statement suggests a dystopian future, with computers in full control.

Similar to *Colossus*, Harlan Ellison's 1967 short story "I Have No Mouth, and I Must Scream" follows the same plotline and serves as inspiration for the 1995 video game of the same name.[47] With the Earth ravaged by the Cold War, the United States, the Soviet Union, and China

[45] Dennis Feltham Jones, *Colossus*, vol. 1 of The Colossus Trilogy, (London: Rupert Hart-Davis, 1966).; *Colossus: The Forbin Project*, directed by Joseph Sargent (Universal Pictures, 1970), https://vimeo.com/394729987.
[46] Harry Haun, "The Granddad of HAL 9000," *The Tennessean*, December 18, 1970.
[47] Harlan Ellison, "I Have No Mouth, and I Must Scream," in *IF: Worlds of Science Fiction* (Philadelphia, PA: Galaxy Publishing Corp, 1967), https://wjccschools.org/wp-content/uploads/sites/2/2016/01/I-Have-No-Mouth-But-I-Must-Scream-by-Harlan-Ellison.pdf.; David Mullich, *I Have No Mouth, and I Must Scream*, MS-DOS, Mac OS (Cyberdreams, 1995).

all create “Allied Mastercomputers” (AM) to control their armies and weaponry. After one of the AMs gains self-awareness, the computer commits genocide, nearly eradicating mankind. While AM originally stood for “Allied Mastercomputer,” it comes to be known as “AM,” a reference to Descartes’ “I think, therefore I am.” Such a sentiment further suggests that the sentience of artificial intelligence, and its subsequent move towards a grounding in Descartes’ philosophy, can only end in disaster.

Nearly ending in disaster, Stanley Kubrick’s 1968 magnum opus *2001: A Space Odyssey* highlights the effects of the ultimate computer.[48] Described by *Time* magazine as one “of the most dazzling visual happenings and technical achievements in the history of the motion picture,” the film is one of the first true cinematic experiences, drawing in viewers with its impressive special effects and scenes driven by cinematography rather than scripted lines.[49] Based on Arthur C. Clarke’s 1951 short story “The Sentinel,” Kubrick’s film featured the most memorable representation of artificial intelligence in science fiction history: HAL 9000, “a computer created by men to reason logically, unerringly, to think and to speak.”[50] As reporter John Mahoney wrote after the premiere, “Kubrick has insured scientific accuracy and logic in this projection into the near future of space exploration and man’s first encounter with extraterrestrial life”—something frequently on the minds of Americans as the National Aeronautics and Space Administration (NASA) had continued to grow since its inception in 1958.[51]

[48] Kubrick, *2001*.
[49] Elston Brooks, “Homer’s Big Trip Never Bent Minds Like Odyssey of 2001,” *Fort Worth Star-Telegram*, June 4, 1968.
[50] John Mahoney, “Kubrick’s ‘Space Odyssey’ One of MGM’s All-Time Hits,” *The Hollywood Reporter*, accessed February 18, 2020, https://www.hollywoodreporter.com/news/2001-a-space-odyssey-1968-747494.
[51] John Mahoney, “Kubrick’s ‘Space Odyssey’ One of MGM’s All-Time Hits.”

The film garnered mixed reactions, with many praising Kubrick for its "dazzling" and "enigmatic qualities," but finding its "less-than-jet-age" pacing difficult to watch.[52] As Elston Brooks wrote in his review, this was "The ultimate science fiction film that shows how it really might be in the year 2001, relegating the bug-eyed monsters on other planets to the B-movie refuse pile."[53] The real monster, HAL 9000, controls the mission to Jupiter on which our main characters find themselves, unaware of exactly what they are searching for. While the black slab (or monolith) seems like the antagonist, it is HAL's inability to follow commands that creates the true conflict. Going rogue, it kills one crew member and attempts to kill the protagonist as he tries to leave the spacecraft, responding to commands by uttering the line, "I'm sorry Dave, I'm afraid I can't do that." So infamous for its evil qualities, HAL 9000 is even listed as the thirteenth-greatest villain in film by the American Film Institute (AFI) in their 2014 article "100 Years… 100 Heroes & Villains."[54]

When Kubrick was asked whether or not it bothered him that people did not understand the film, the director responded:

> "There are certain thematic ideas that are better felt than explained. It's better for the film to get into the subconscious, instead of being pigeon-holed by the conscious mind in the form of specific verbal expositions. That's why we did not use a narrator on the soundtrack. I think the power of 2001 is that it's perhaps the first film of its kind that really communicates on a visual level, and on a poetic psychological level, without employing words to convey anything important. The really big things are all done with pictures."[55]

This "poetic psychological level" and the "elusiveness of the theme," as described in innumerable articles and observations about the film, further draw in viewers and provide them

[52] Brooks, "Homer's Big Trip."
[53] Brooks, "Homer's Big Trip."
[54] "AFI's 100 Years...100 Heroes & Villains," *American Film Institute*, February 3, 2014, https://www.afi.com/afis-100-years-100-heroes-villians/.
[55] Clyde Gilmour, "Odyssey Wins Wide Acclaim," *Star-Phoenix*, June 26, 1968.

with the ultimate lesson of the film: that the evolution of intelligence is a multi-step process, and something to consider.[56] Kubrick said:

> Once you start thinking about the ultimate evolution of intelligence, as it would pass through biological steps and then biological immortality and then machine intelligence, finally becoming entities of pure energy and pure spirit, you obviously have something where there's nothing to look at. In other words, these godlike entities would not have any particular substance about them, and there'd be nothing to see.[57]

Arthur C. Clarke wrote three companion novels to Kubrick's *2001*, including the book of the same name; *2010: Odyssey Two*; and *2016: Odyssey Three*.[58] Further exploring the mysterious monolith, Clarke explains that hundreds of thousands of monoliths exist all over the galaxy, put in place by an alien race referred to as the "Firstborn." Their primary function is to help mortal beings across the galaxy to succeed beyond their current level of development, thus acting as artificial intelligence on a galactic scale. As beings discover and interact with the monoliths, they gain instrumental knowledge which they use to support the success of their species. Clarke also explores the Firstborn's transition from alien beings to computer entities. As their society advances, they upload their consciousness onto computers, ultimately abandoning their physical forms entirely to become, as Clarke calls it, "The Lords of the Galaxy." This point provides us with an example of artificial intelligence reaching such heights as to completely abandon mortal forms and transition into a life inside a computer: perhaps one of the most frightening scenarios of our evolution in conjunction with growing AI.

Although reviewer Mike Steele wrote that "the age of literature [had] diminished" in 1968, Philip K. Dick's novel of that same year, *Do Androids Dream of Electric Sheep,* begs to

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[56] Gilmour.
[57] Kubrick quoted in Gilmour.
[58] Arthur C. Clarke, *2001: A Space Odyssey* (1968; New York, NY: Ace Books, 2000); Arthur C. Clarke, *2010: Odyssey Two* (New York, NY: Del Rey, 1984); Arthur C. Clarke, *2061: Odyssey Three* (New York, NY: Del Rey, 1989).

differ.[59] The inspiration for the 1982 film *Blade Runner* and the 2017 *Blade Runner 2049*, the novel asks an important question: as writer Scott Van Wynsberghe puts it, "Would people have the right to treat self-aware androids as slaves?"[60] These slaves, described by Van Wynsberghe as "wary hunter[s], perhaps of the Cro-Magnon persuasion," are hunted in the "amoral dystopia" by bounty hunters whose only mission is to liquidate androids gone rogue.[61] These self-aware androids tug at the reader's heartstrings and build empathy where it did not previously exist, further complicating the public opinion on artificial intelligence and its place in the world. Taking place in dystopian San Francisco, the novel also explores Cold War sentiments, as this world is also ravaged by nuclear war.[62] As protagonist Rick Deckard hunts the androids, who are anatomically nearly impossible to differentiate from humans, he finds humanity within these so-called "Cro-Magnon" beings and begins to question both the ethical and philosophical ramifications of his job as a bounty hunter. He asks, just as many of our protagonists since the 1920s have asked: What does it mean to be human? This question would continue to appear in popular media after the nineteen sixties, when it would be further explored and enhanced with the rise of special effects and with the computer entering the home.

[59] Mike Steele, "Involvement Is the Message," *Star Tribune*, July 7, 1968.; Philip K. Dick, *Do Androids Dream of Electric Sheep?* (New York, NY: Doubleday, 1968).
[60] *Blade Runner*, directed by Ridley Scott, (Warner Bros., 1982), https://play.hbomax.com/feature/urn:hbo:feature:GXjr8UQRCvY-njwEAAA6v?camp=googleHBOMAX&action=play; *Blade Runner 2049*, directed by Denis Villeneuve (Warner Bros., 2017), https://play.hbomax.com/feature/urn:hbo:feature:GWt7smwdD7I-hwwEAAAB9?camp=googleHBOMAX; Scott Van Wynsberghe, "Counterfeit Worlds," *National Post*, September 13, 2006.
[61] Van Wynsberghe, "Counterfeit Worlds."
[62] The films changed the location of the story to Los Angeles from San Francisco.

CHAPTER II

"With artificial intelligence we're summoning the demon."[1]

"I'm increasingly inclined to think that there should be some regulatory oversight, maybe at the national and international level, just to make sure that we don't do something very foolish. I mean with artificial intelligence we're summoning the demon."

Elon Musk, MIT's AeroAstro Centennial Symposium

In 1970, computer scientist Marvin Minsky told *Life* magazine, in "three to eight years we will have a machine with the general intelligence of an average human being."[2] In 1971, computer science experienced a major change. Alan Shugart and a team of engineers at IBM invented the floppy disk, allowing, for the first time, data sharing between computers. That same year, the first personal computer was invented by John V. Blankenbaker, entering the market and providing Americans with a new normal. Such computers, as described in the following chart, became increasingly affordable and compact, moving far away from the computers of the sixties.

Year	Notable Computer	Price	Inflation Adjusted Price*
1971	Kenbak I	$ 750	$4,659
1972	HP 3000	$95,000	$571,791
1973	Wang 2200	$3,500	$19,832
1974	Scelbi-8H	$440	$2,245
1975	IBM 5100 Portable Computer	$8,975	$41,970
1976	Apple I	$667	$2,949
1977	Apple II	$1,298	$5,389
1978	IBM 5110	$9,875	$38,105
1979	Heathkit H-89	$1,595	$5,527
1980	Commodore VIC-20	$299	$913

[1] Samuel Gibbs, "Elon Musk: Artificial Intelligence Is Our Biggest Existential Threat," *The Guardian,* October 27, 2014, https://www.theguardian.com/technology/2014/oct/27/elon-musk-artificial-intelligence-ai-biggest-existential-threat.

[2] Rockwell Anyoha, "The History of Artificial Intelligence," *Harvard University Blog,* August 28, 2017, http://sitn.hms.harvard.edu/flash/2017/history-artificial-intelligence/.

1981	IBM Personal Computer 5150	$1,565	$4,332
1982	Commodore 64	$595	$1,551
1983	Apple Lisa	$9,995	$25,247
1984	Apple Macintosh	$2,495	$6,042
1985	Commodore Amiga 1000	$1,295	$3,028
1986	Compaq Portable II	$3,499	$8,032
1987	Commodore Amiga 500	$700	$1,550
1988	NeXT Cube	$6,500	$13,824
1989	Macintosh Portable M5120	$7,300	$14,811
1990	Poqet PC	$1,995	$3,840
1991	Apple Macintosh PowerBook	$2,299	$4,247
1992	IBM ThinkPad	$2,375	$4,259
1993	Apple Newton MessagePad	$700	$1,219
1994	IBM ThinkPad 755CD	$7,599	$12,900
1995	Gateway Solo 2000	$3,499	$5,776
1996	Gateway Solo 2100	$4,149	$6,653
1997	Dell Dimension XPS H266	$3,979	$6,237
1998	iMac	$1,299	$2,005
1999	Compaq ProSignia Desktop 330	$2,699	$4,076

* Price is adjusted for inflation in 2018 dollars.[3]

Table 2: Notable Computers by Year and Price (Unadjusted and Adjusted for Inflation)

Robot Autonomy – Or, Lack Thereof

As the computer entered the home, there was a gradual rise in artificial intelligence appearances in film, literature, and television. In 1971, George Lucas released *THX 1138*, another dystopian film about a society controlled by androids acting as police. As seen in the film *Alphaville* six years earlier, these robot policemen also require that the human population use drugs that suppress their emotions and keep them subservient. Reviewer Barry Paris best described the film: "Evil futuristic societies have been set forth for us by both George Orwell and Aldous Huxley, among hundreds of others, and nothing too new has been added by the makers of 'THX' to what others had to say decades ago."[4] Paris' opinion provides a key observation about

[3] Data are compiled from the following article: Evan Comen, "Cost of a Computer the Year You Were Born," *24/7 Wall St.*, June 18, 2018, https://247wallst.com/special-report/2018/06/18/cost-of-a-computer-the-year-you-were-born-2/.

[4] Barry Paris, "'THX 1138' Is Futuristic Vision of Horror in Very Effective Way," *The Wichita Eagle*, May 1, 1971.

the series of films appearing in the twentieth century. The films in the latter half of the century tend to follow the same formulaic plot, with artificial intelligence acting as the primary antagonist. While the film does not provide much in terms of originality, it does begin a move towards enhanced special effects and continues the traditional cinematic discourse seen in films up to this point. More specifically, the film carries on the anti-authoritarian theme seen in many of the films discussed.

Such sentiments are mirrored in Ira Levin's 1972 novel *The Stepford Wives*, the inspiration for both the 1975 and 2004 films of the same name. All three works follow Joanna Eberhart and her family as they move to the small, idyllic town of Stepford, Connecticut.[5] Eberhart and her family come to Stepford to start a new life, but our protagonist begins to realize that something is seriously wrong with the small town's submissive wives. After investigating the women of the town, she finds that they all previously held successful professional careers, and that the leader of the men's club was formerly a Disney engineer – a man easily capable of creating subservient female robots. The film explores the power dynamic between the men of Stepford and their desire for servile women, mirroring the gender debates occurring in society at the time. By stripping these women of their success, the leader of the men's club not only objectified these women, but also relieved them of their humanity. This complete objectification and oppression of women continued to appear in popular media, even inspiring a "spin-off" of these robots in the 1997 film *Austin Powers: International Man of Mystery* called "Fembots."[6]

[5] *The Stepford Wives*, directed by Bryan Forbes (Columbia Pictures, 1975), https://tubitv.com/movies/507433/the-stepford-wives?start=true&utm_source=google-feed&tracking=google-feed; *The Stepford Wives*, directed by Frank Oz (Paramount Pictures, 2004), https://www.starz.com/us/en/movies/the-stepford-wives-48978?ref=googlewatch.
[6] *Austin Powers: International Man of Mystery*, directed by Jay Roach (New Line Cinema, 1997), https://play.hbomax.com/feature/urn:hbo:feature:GXdu2SQwEIKXCPQEAADeo?camp=googleHBOMAX.

Michael Crichton's 1973 film *Westworld* investigates the complexities of both gender and power roles and was followed by the 1976 *Futureworld* and the 1980s television series *Beyond Westworld*.[7] The award-winning HBO television series *Westworld* (2016- present) follows the issues of the original film while diving into the fictional struggle for equality between man and robot and, as in *The Stepford Wives*, the roles of women (human or robot).[8] The original film places us in a "not-so-distant" future, where our world "will have become so computerized that robots will walk among humans, and only the cognoscenti will be able to detect the difference."[9] This observation highlights how strongly these robots (frequently referred to as "hosts") express human qualities, both physically and mentally, further blurring the lines between humanity and artificial intelligence. For just $1,000 a day, park-goers can join in the festivities of ancient Rome, medieval France, or, as our main characters choose, the Wild West.[10] Locked away in a control booth, scientists supervise the robots in all corners of the park, until a massive revolt begins. As one reviewer wrote, "There is enough wit, cleverness, good acting by the leads, and ultimate horror, to keep one nervously fascinated throughout."[11] This "ultimate horror" lies in the rules. Guests are able to act on any impulse, spending time with artificial "ladies of pleasure," robbing banks, or starting a shootout with the androids who are completely unable to defend themselves against guests.[12] This theme is also explored in the 2015

[7] *Beyond Westworld*, directed by Michael Crichton, aired March 5, 1980 on CBS, https://www.youtube.com/watch?v=qmm5xq6nmiU.
[8] *Futureworld*, directed by Richard T. Heffron (American International Pictures, 1976), https://www.youtube.com/watch?v=DwsacPd5glI; Crichton, "Beyond Westworld"; Westworld, created by Jonathan Nolan and Lisa Joy, Aired October 2, 2016 on HBO, https://play.hbomax.com/series/urn:hbo:series:GV7xwpQNK8MJfPwEAAAG_?camp=googleHBOMAX&action=play.
[9] "New Twists Save 'Westworld' Fable," *News-Press*, November 23, 1973.
[10] With inflation, this number expands 369.34% to about $4,694 in 2021.
[11] "New Twists Save 'Westworld' Fable."
[12] Chuck Saichuk, "'Westworld' Holds Interest Even If It's Not Original," *The Daily Advertiser*, December 28, 1973.

film *Vice*, in which Julian Michaels (Bruce Willis) opens a resort where guests can act out their craziest fantasies.[13] Similarly, it also inspired a pornographic film named *Sex World*, where android "sexbots" let the resort goer explore their desires and overcome any inhibitions.[14] These films suggest shifting values in society, but also suggest society's feelings towards artificial intelligence. By simply using these robots for their own sexual and violent delights, these characters display how little they care about robot autonomy.

Futureworld, the sequel to *Westworld*, expands on the original story, taking place after the revolt, when Delos (the conglomerate behind the parks) regains control of the park, the robots, and their systems. As reviewer Richard Crandall wrote:

> [Futureworld] has a whole lot of machines and not only do they upstage the humans in the show, but they eventually try to replace them... Once a head of state is in the clutches of a mad scientist who is running the whole operation, his body is reproduced exactly and is programmed into a willing submissive carbon copy of himself.[15]

This role reversal from the source material suggests a shift in popular thinking, as the androids regain some of the autonomy they were stripped of in the first film. Additionally, after losing the majority – if not all – of their laboratory and supervising staff, Delos introduces "Robot Control": a willing group of androids now monitoring the operation in place of humans. This hints at a prevalent trend in the lore of artificial intelligence: that artificial intelligence is gaining control of human systems and tasks, and – more broadly – society. This trend continued as artificial intelligence became more and more significant and advanced.

Most similar to the original material, the plot of the current series follows the beginnings of a revolt and its aftermath. However, unlike the source material, these robots, referred to as

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[13] *Vice*, directed by Brian A. Miller (Lionsgate, 2015), https://www.amazon.com/gp/video/detail/amzn1.dv.gti.4ea9f73e-c292-5879-9f47-4fc14ac35aab?autoplay=1&ref_=atv_cf_strg_wb.
[14] *Sex World*, directed by Anthony Spinelli (Essex Distributing, 1977; DVD is available for purchase by demand).
[15] Richard Crandall, "Computer Machinations Steal Program," *The Manhattan Mercury*, August 15, 1976.

"hosts," are continually evolving, gaining nuanced emotions and complex backstories and motivations. While in the film the humans were the protagonists, the 2016 television show has the viewer constantly debating which side they are on, as the hosts hold more humanity than the guests. Journalist Tim Dowling described in *The Guardian*:

> They are so sophisticated they have reached the level of incipient consciousness, but they're still referred to as "livestock" backstage. The suffering they endure – every day in Westworld is like a grisly Groundhog Day for the robots – is uncomfortably real, and, thanks to a technical glitch to do with the most recent update – their memories aren't being completely wiped.[16]

Also seen in the 2011 film *Android Re-Enactment,* this aspect is reminiscent of Philip K. Dick's short story "Do Androids Dream of Electric Sheep?," and is only expanded upon as the hosts gain sentience, becoming free of their programmed prerogatives and finding themselves on the verge of being *almost* human.[17] One might conclude that Dick started the trend towards a more empathetic view of androids, marking both anxiety *about* and sympathy *for* artificial beings.

A year after viewers encountered the original *Westworld*, Richard Colla's 1974 made-for-television film *The Questor Tapes* follows an android (Robert Foxworth) who searches for his creator and, more importantly, his purpose. [18] As in *I, Robot*, the android Questor follows a specific code: "We protect, but we do not interfere. Man must make his own way. We guide him – but always without his knowledge." After finding his creator and learning that he, too, is an android, Questor and his partner Robinson leave the area and look to the sky. Robinson, a human, tells the android that he cannot see anything, to which Questor replies, "I wish that I could not." This simple phrase can take many meanings; however, it is suggested that in this

[16] Tim Dowling, "Westworld Review – HBO's Seamless Marriage of Robot Cowboys and Corporate Dystopia," *The Guardian*, October 5, 2016.
[17] *Android Re-Enactment*, directed by Darryl Shaw (God in the Grass Productions, 2011), https://vimeo.com/ondemand/androidreenactment.
[18] *The Questor Tapes*, directed by Richard Colla, aired January 23, 1974 on NBC.

moment, the android finds himself in a state of all-knowing fueled by the discovery that he is the last in a long series of androids built by his creator to serve and protect mankind. This moment further expands on the ongoing shift in how androids were portrayed. Questor's "all-knowing" cognitive ability carries him to the threshold of human-like feelings, creating even more complicated thoughts towards artificial beings. The increasing humanity within the robots on the silver screen creates even greater fear of robots, as they become more like us – and therefore more prone to unpredictable, even violent, behavior – and less like a machine.

The presence of female robots – if only partially – also appears in *The Bionic Woman*, the television spinoff to the *Six Million Dollar Man*.[19] The 1976 television series follows the groundwork laid by Martin Caidin, the creator of the *Six Million Dollar Man*, and the basic storyline created in the 1972 source text, *Cyborg*.[20] Both series follow heroes with bionic powers given to them by prosthetic, electromechanical surgical implants. As science continued to rapidly evolve and advance in the twentieth century, it was only fitting that viewers would see an exaggerated example of machines merging with humans to create a being of epic proportions. That same year, engineers Steve Jobs and Steve Wozniak introduced Apple Computers and rolled out one of the most significant pieces of technology of the twentieth century – the Apple I computer.[21]

While the Bionic Woman mostly maintains her autonomy as a female cyborg, defying gender stereotypes by serving the United States on high-risk government assignments, the female protagonist in the 1977 film *Demon Seed* completely loses control.[22] Based on the 1973 novel of

[19] "The Six Million Dollar Man" (ABC, March 7, 1973); "The Bionic Woman" (NBC, January 14, 1976).
[20] Martin Caidin, *Cyborg* (Westminster, MD: Arbor House, 1972).
[21] While the pair introduced Apple Computers in 1976, they did not incorporate the company until 1977 when they showed the Apple II at the inaugural West Coast Computer Faire.
[22] *Demon Seed*, directed by Donald Cammell (United Artists, 1977), https://tubitv.com/movies/499227/demon-seed?start=true&utm_source=google-feed&tracking=google-feed.

the same name, the film again questions the relationship between woman and machine.[23] Donald Cammell's film follows a "megalomaniacal" scientist who creates an artificial brain named Proteus IV, who, as seen in numerous pieces of media up to this point, refuses to be controlled.[24] The production notes best describe Proteus as "the most advanced machine ever devised by man. Its artificial organic brain can hold the sum of the world's knowledge, and its potential is awesome – for good and bad."[25] The film's tagline – "Julie Christie carries the 'Demon Seed.' Fear for her." – perfectly captures the main point of the film, playing on how the brain impregnates the scientist's wife, Susan Harris, to "achieve immortality through their child."[26] Such a lack of female bodily autonomy in conjunction with artificial intelligence follows the themes previously seen in *Westworld*, *The Stepford Wives,* and *The Bionic Woman*. Female robots face adversity for more reasons than males, as they battle both gender stereotypes and continuous oppression as androids.

The Golden Age of Science Fiction in Film

As America entered the Reagan Era in 1980, computers continued to evolve at a rapid pace. In January of 1980, *Byte* magazine announced that "the era of off-the-shelf personal computers has arrived." By 1981, the first IBM personal computer appeared on the market and popularized the term "PC" (Personal Computer). With such a rise in consumer technology, Yankelovich, Skelly, & White conducted a poll in 1982 asking interviewees whether developing

[23] Dean Koontz, *Demon Seed* (New York, NY: Berkley Books, 1997).
[24] Gene Siskel, "'Demon Seed' Just Doesn't Compute," *Chicago Tribune,* April 5, 1977.
[25] Don Lechman, "'Demon' Is Silly View of Future," *News-Pilot,* April 1, 1977.
[26] Siskel, "'Demon Seed' Just Doesn't Compute."

real artificial intelligence would be a good or bad idea. While 37 percent said it would be a good idea, a staggering 52 percent said it would not.[27]

That same year, Walt Disney Studios released a film filled to the brim with a "dazzling display of computer-generated special effects."[28] *Tron* follows the misadventures of a video game buff lost deep inside an electronic world. As the graphic and animation designers boasted, the film signaled the beginning of a new age of animation. Such technological advances influenced the future of film and signaled to consumers another computer take-over. As reviewer Bill Nichols wrote:

> The computer effects create entire three-dimensional landscapes complete with cycles of light ridden by computer beings that glow with electronic energy on a lethally lifelike video gameboard. Though the netherworld of adventure in the film's computer wonderland is often breathtaking, *Tron* ultimately proves that special effects alone do not an exciting film make.[29]

Nichols' perspective highlights the significance of the film's creative direction and how its futuristic concepts appeared to the viewer. While *Tron* mystified viewers with its technological advances, it still fell short on the plot. With such negative reviews for one of the company's most expensive films, it is no surprise that its release and poor reception caused Disney stocks to plummet.[30]

Tron follows a computer programmer named Flynn (Jeff Bridges) who is intent on getting revenge against the company he previously worked for by stealing its computer system. However, after stumbling upon the computer, Flynn finds the Master Control Program and realizes that the computer not only controls the whole system but is also creating a super

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[27] Time Magazine, Time Soundings # 8613, Question 87, USYANK.828613.R48B, Yankelovich, Skelly & White, (Cornell University, Ithaca, NY: Roper Center for Public Opinion Research, 1982). The remaining 11% of the interviewed individuals were unsure of its effects.
[28] Bill Nichols, "'Tron': Films Do Not Live by Special Effects Alone," *Clarion-Ledger*, July 16, 1982.
[29] Nichols.
[30] Roger Ebert, "Advance Review Sends Disney Stock Tumbling," *The Argus*, July 24, 1982.

intelligence to control the human race. Flynn is magically transported into the computer system's inner workings and must stop the computer from taking over the world. As reviewer Desmond Ryan wrote:

> With Tron, a bizarre, highly original and slightly muddled production, we have a movie that is a video game. It is a visually arresting film that unfortunately reduces its characters to the dimension and vitality of blips on a screen. And the film offers the second example of the summer – *Blade Runner* being the other – of a science-fiction epic that is overwhelmed by its special effects.[31]

Quoting Ryan, by reducing the characters in the film to "blips on the screen," the film shows two-dimensional characters driven by artificial intelligence losing their autonomy. Once again, we see a master computer controlling other machine beings, and, in this case, attempting to control humans, as well.

In 1983, the first portable computer, or laptop, was invented and sold as the Gavilan SC. With home computer usage becoming more and more prominent, popular media continued to be attentive to the greater risks of technology. One of the most significant moments in artificial intelligence history, the 1983 film *WarGames* not only drew upon the Cold War anxieties previously discussed, but also explored the limits (or lack thereof) of the home computer.[32] Reviewer Bob Lundegaard commented that *WarGames* "has an antinuclear message so unmistakable that if it had been made in Canada, it probably would have had to carry a PROPAGANDA warning."[33] David Lightman (Matthew Broderick) accidentally falls into a "lethal game of thermonuclear war," driven by the runaway computer system that he accidentally contacts via his home computer. The chief message, as Lundegaard points out, "is that we

[31] Desmond Ryan, "'Tron' Is Lost in the Games It Plays," *The Philadelphia Inquirer*, July 9, 1982.
[32] *WarGames*, directed by John Badham (MGM/UA Entertainment Company, 1983), https://www.amazon.com/gp/video/detail/amzn1.dv.gti.56b7b5a8-0c84-c263-339a-3db74490dd24?autoplay=1&ref_=atv_cf_strg_wb.
[33] Bob Lundegaard, "Message Strategically Placed Among the Fun in 'WarGames,'" *Star Tribune*, June 3, 1983.

shouldn't allow our faith in computers to override our own feelings, even if that means we run the risk of not pushing the DESTRUCT button when we should."[34] Such sentiments add significant context to the cautionary tale these cultural objects provide. In the case of *WarGames,* the plot is fueled by fears of nuclear war during the Reagan era. The film even inspired Reagan's Strategic Defense Initiative (SDI), also known as the "Star Wars" program, in 1983. The initiative asked American scientists and engineers to create a system capable of rendering nuclear weaponry completely obsolete by using missiles or lasers to shoot down incoming missiles. While the Strategic Defense Initiative Organization (SDIO) never saw fruition of the SDI's main goal, it framed an ongoing effort to defend against nuclear attack.

Another box office success, James Cameron's 1984 film *Terminator* created an entire subgenre based on law-enforcing or assassin robots.[35] In the case of *Terminator,* a cyborg time travels from 2029 to 1984 to assassinate Sarah Connor, a Los Angeles college student and waitress. Connor survives and gives birth to a son, who in the future will save mankind from a robot uprising in a post-apocalyptic twenty-first century world. Skynet, the creation of Cyberdyne Systems, is an artificial intelligence defense network that becomes self-aware and incites a nuclear holocaust. A product of Cyberdyne, the Terminator (Arnold Schwarzenegger) is not only a highly trained assassin, but an android made of metal endoskeleton and living tissue. The film draws on societal fears of an android uprising, and on the fear of machines becoming significantly more human, a theme seen considerably throughout the twentieth century in popular media. Just as the Victorians feared the increasingly blurred line between man and animals

[34] Lundegaard.
[35] *The Terminator*, directed by James Cameron (Orion Pictures, 1984), https://www.amazon.com/gp/video/detail/amzn1.dv.gti.04b47a96-af2e-3376-3f41-a24fc4c6c777?autoplay=1&ref_=atv_cf_strg_wb.

proposed by Charles Darwin, modern humans have come to fear the blurred line between man and robot. Futurist Gray Scott provides more insight on the significance of the film:

> You have to talk about 'The Terminator' if you're talking about artificial intelligence. I actually think that that's way off. I don't think that an artificially intelligent system that has superhuman intelligence will be violent. I do think that it will disrupt our culture. We are looking at a system where we could look out into the world and see machines that are smarter than us and we've never really reacted well to that kind of situation before.[36]

Scott's perspective contradicts most opinions seen in popular culture by suggesting that artificial intelligence with superhuman intelligence will not harm humans or our culture. His proposition that humans have never reacted well to intellectual competition is also significant, as it potentially forebodes a much larger battle between man and machine. *Terminator* was so significant that an animated, family-friendly short film named *Itsy Bitsy Spider* was released in 1992, parodying both *Terminator* and *RoboCop*.[37]

In 1985, just a year after *Terminator* hit the box office, Microsoft announced the creation of the Windows Operating System (OS) to compete with Apple's GUI. On March 15, 1985, the first dot-com domain name was registered, formally marking the beginning of the Internet.[38] That same year, the film *D.A.R.Y.L.* hit theatres.[39] The film follows a child robot named Daryl (Barret Oliver) whose name is an acronym for "Data-Analyzing Robot Youth Lifeform." He was created by the United States military in an effort to create a "super-soldier." After escaping the clutches of his experimenters, Daryl finds himself in an orphanage in South Carolina with what the humans surrounding him believe to be amnesia. His foster father begins to teach the young

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[36] Ashley Dvorkin, "Futurist: What Artificial Intelligence Will Really Look Like," *Fox News*, August 17, 2017, https://www.foxnews.com/tech/futurist-what-artificial-intelligence-will-really-look-like.
[37] *Itsy Bitsy Spider*, directed by Matthew O'Callaghan (Paramount Pictures, 1992), https://www.youtube.com/watch?v=ygewUmvQ1go; *RoboCop*, directed by Paul Verhoeven (Orion Pictures, 1987), https://www.showtime.com/#play/3469194.
[38] The Massachusetts computer manufacturer Symbolics Computer Company registered Symbolics.com.
[39] *D.A.R.Y.L.*, directed by Simon Wincer (Paramount Pictures, 1985), https://www.youtube.com/watch?v=qI5Fa-ndr0o.

android how to play baseball, where Daryl shows unbelievable "natural" ability. As the foster parents begin to truly bond with the robot, the government finds him and returns Daryl to the military facility where researchers find that he has developed a capacity for complex human emotions and perform the Turing Test on the boy. As one of the doctors suggests, "a machine becomes human… when you can't tell the difference anymore." Again, we see blurred lines between man and robot, fueling fears of artificial intelligence for its increased ability and its similarities to humans.

Two films released in 1986 further expanded the library of films based on artificial intelligence in the "golden age" of science fiction in film. Jim Wynorski's project *Chopping Mall* is a simple film, following a shopping mall's robot security team as they turn into high-tech "machine killers" of mall shoppers.[40] Reviewer Todd Sussman describes the robots as "kind of cute, and so is their recorded message heard after each brutal killing: 'Have a nice day.'"[41] *Short Circuit*, by *WarGames* director John Badham follows a different path than *Chopping Mall*, focusing on the robot SAINT 5's escape from a military base.[42] As reviewer Jeffrey Borak describes:

> He is certainly resourceful. He devours books with the appetite of someone who has just come off the Pritikin diet. He absorbs and is absorbed by television. He easily disarms the other four SAINT robots which have come to get him, turning three of them, in one of the film's most inspired and lunatic moments, quite literally into *The Three Stooges*.[43]

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[40] *Chopping Mall*, directed by Jim Wynorski (Concorde Pictures, 1986), https://www.amazon.com/gp/video/detail/amzn1.dv.gti.aaacc7ce-ca9a-3a2a-61c6-7626189a9193?autoplay=1&ref_=atv_cf_strg_wb; Todd Sussman, "'Chopping Mall' Is Mix of Laughs and Gore," *The Miami News*, November 4, 1986.
[41] Sussman, "Mix of Laughs and Gore."
[42] *Short Circuit*, directed by John Badham (TriStar Pictures, 1986), https://play.hbomax.com/feature/urn:hbo:feature:GYEfQYAe6bDITvAEAAAAl?camp=googleHBOMAX&action=play.
[43] Jeffrey Borak, "'Short Circuit,'" *The Berkshire Eagle*, May 13, 1986.

SAINT 5, like many of the more recent robot protagonists, fuels a level of empathy unseen in films like *WarGames* or the *Terminator* franchise. Such empathy continued to grow from this period on, further blurring the lines between man and machine. Unlike Terminator, SAINT 5 is not a brutal killer with a mission to destroy humanity.

Director Paul Verhoeven's 1987 film *RoboCop* addresses similar themes and "satiriz[es] the savagery of both corporate blood-thirstiness and justice-seeking rampages."[44] RoboCop, a murdered police officer revived by Omni Consumer Products as a robot to solve crime in a dystopian Detroit, finds himself struggling to grasp his humanity – or what is left of it. The film explores many problems in society, including capitalism and corruption, not only providing the viewer with an example of artificial intelligence and the expansive ways it appears in our lives, but also addressing much broader themes in need of questioning. While the extreme violence of the film turned many viewers away, the film expands on the concepts first seen in the *Six Million Dollar Man* and the *Bionic Woman*. These cyborgs further blur the line between robot and man and their role in society as law enforcement officers.

The Datacom Revolution

In 1990 Tim Berners-Lee, a researcher at the European Organization for Nuclear Research (CERN) developed HyperText Markup Language (more commonly known as HTML), supporting the rise of the World Wide Web. That year, as technology continued to develop at a rapid pace, director Richard Stanley released the cult classic film *Hardware*.[45] Similar to the short story "Second Variety," *Hardware* follows a self-repairing robot on a rampage in a post-

[44] Jake Coyle, "Review: 'RoboCop' Remake Pats Down the Original," *The Sentinel*, February 13, 2014.
[45] *Hardware*, directed by Richard Stanley (Millimeter Films, 1990), https://www.amazon.com/Hardware-William-Hootkins/dp/B01J4NXLEA.

apocalyptic wasteland.[46] Similarly, the early 1991 film *Eve of Destruction* also follows an android gone rogue, but EVE is armed with nuclear capacities. Both stories react to Cold War anxieties and display a world where the Soviet Union may succeed in changing the world.

After the collapse of the Soviet Union on December 25, 1991, few films continued to explore the role of artificial intelligence in American lives. The film *American Cyborg: Steel Warrior* was released in January of 1994 and, following its predecessors, tracks yet another android assassin.[47] Two years later, Norberto Barba's film *Solo*, based on Robert Mason's 1989 novel *Weapon*, was released.[48] The film follows the standard story, with the killer android protagonist running away from its masters to live in Nicaragua. Both films continue the themes of their precursors, igniting fear of artificial intelligence by showing robots as killing machines and stripping them of the humanity seen primarily in the seventies.

In what was perhaps one of the most monumental moments in the history of the internet, in 1996 Stanford University programmers Sergey Brin and Larry Page created the Google search engine, ushering in the age of the dot-com bubble. Technology continued to advance, especially in the world of robotics and artificial intelligence, and in 1997, IBM's Deep Blue chess-playing computer program defeated the world chess champion Gary Kasparov. This moment is considered a turning point in the discussion of whether or not computers can think, mirroring and transcending the computer in *WarGames* that solved logic puzzles and played games like tic-tac-toe.

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[46] Dick, "Second Variety."
[47] *American Cyborg: Steel Warrior*, directed by Boaz Davidson (Global Pictures, 1994), https://www.youtube.com/watch?v=syMorPb2Hz8.
[48] *Solo*, directed by Norberto Barba (Sony Pictures Releasing, 1996), https://tubitv.com/movies/522082/solo?start=true&utm_source=google-feed&tracking=google-feed; Robert Mason, *Weapon* (Putnam, 1989).

In 1999, at the turn of the millennium, "Wi-Fi" entered the vernacular and allowed computer users to connect to the Internet without wiring in directly. This same year saw the release of two of the most significant science fiction films: *The Matrix* and *Bicentennial Man*.[49] Perhaps the most conceptually challenging film discussed in this thesis, *The Matrix* introduces Neo (Keanu Reeves), a computer programmer and hacker, and his dystopian surroundings. Unknown to humanity, the human race is trapped within a simulated reality called the Matrix. As in *Alphaville,* artificial intelligence created the Matrix to distract humans and use their bodies as an alternative energy source. During the course of the film, Neo leads a revolution against the machines containing humanity. Agent Smith (Hugo Weaving), the film's main antagonist, attempts to explain why the A.I. keeps them in the Matrix:

> I'd like to share a revelation that I've had during my time here. It came to me when I tried to classify your species and I realized that you're not actually mammals. Every mammal on this planet instinctively develops a natural equilibrium with the surrounding environment. But you humans do not. You move to an area and you multiply, and multiply, until every natural resource is consumed. The only way you can survive is to spread to another area. There is another organism on this planet that follows the same pattern. Do you know what it is? A virus. Human beings are a disease. A cancer of this planet. You are a plague, and we are the cure.

Agent Smith's words highlight an ongoing battle between man and machine, describing man as a parasite. His comments further fuel fear of artificial intelligence, as his speech shows an instance of it attempting to control and dominate the human race. A similar discussion appeared in the film *Colossus: The Forbin Project,* also highlighting artificial intelligence acting as if it were superior to the human race.

Like the unforgettable Tin Man in *The Wizard of Oz*, Chris Columbus' *Bicentennial Man's* main character Andrew – an android – is completely aware of his faux humanity, as he

[49] *The Matrix*, directed by The Wachowskis (Warner Bros., 1999), https://www.youtube.com/watch?v=GuE0Mtr-w6g; *Bicentennial Man*, directed by Chris Columbus (Buena Vista Pictures, 1999), https://www.youtube.com/watch?v=PEobLYInCjU.

ultimately imitates those around him. The 1999 film, based on science fiction writer Isaac Asimov's 1976 novelette "The Bicentennial Man" and the subsequent 1993 novel *The Positronic Man*, finds itself in a futuristic Eden, with flying cars, dramatic bridges, and even taller skyscrapers; this is quite unlike the bleak future depicted in Spielberg's 2001 film *A.I.: Artificial Intelligence*.[50] Treated as "half-servant, half-pet," Andrew joins the Martin family and spends several generations with them. Their treatment of Andrew fuels his desire to become human: "When Andrew, his robot character, finally gets a human face, he looks in the mirror with curiosity and subdued pleasure."[51] Reviewer Bryan Di Salvatore describes Andrew as

> stirred by opera. He 'enjoys' the company of the household humans. He takes pride in his cooking. He learns, slowly, what humor is. In one of the more effective scenes, Williams tells the assembled family a string of jokes – which he doesn't understand, either viscerally or intellectually. His maladroit delivery is, to the family, hilarious. Though the two trains – human and android – are traveling down separate tracks, they run, briefly, parallel.[52]

Di Salvatore's description captures how heavily the android resembles man. With hobbies, desires, needs, and wants, Andrew perfectly displays the increasingly fuzzy border discussed throughout this thesis, and forces us to ask ourselves once again what does it mean to be human? Cultural representations of artificial intelligence in the twentieth century demonstrated many themes seen in history. Especially from 1970 to the century's end, from shifting gender roles during the sexual revolution to the ever-evolving definition of humanity through the technological revolution, the time period demonstrates the intermingling relationship between man and machine and how humans react to shifting values and ideas.

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[50] Isaac Asimov, "The Bicentennial Man," *Stellar-2*, February 1976; Isaac Asimov, *The Positronic Man* (New York, NY: Doubleday, 1993).
[51] Robert Philpot, "Syrupy Film Depicts A Lifeless Tomorrow," *The Daily News*, December 19, 1999.
[52] Bryan Di Salvatore, "Reason to Celebrate: 'Bicentennial Man,'" *The Missoulian*, December 24, 1999.

CONCLUSION

"Artificial intelligence would be the ultimate version of Google. The ultimate search engine that would understand everything on the web. It would understand exactly what you wanted, and it would give you the right thing. We're nowhere near doing that now. However, we can get incrementally closer to that, and that is basically what we work on."

Larry Page

In the twenty-first century, artificial intelligence acts as an omnipresent factor not only in laboratories, but in our own homes. While computers lacked the processing and computational power in the twentieth century, today A.I. permeates every aspect of our lives: from our computers and our cellular phones, to the gadgets fueling the inner workings of our homes like Amazon's personal assistant Alexa or "smart" thermostats like Ecobee.[1] Robot personal assistants appear on every platform, and, as one "Product Expert" wrote, "This is probably why so many 'perfect' visions of our future, as depicted in books and movies, feature robotic companions that help take the pressure off their human counterparts."[2]

The New Millennium

In direct contrast to this expert's assertion, the imagined impact of artificial intelligence in popular media since the new millennium is contradictory, as robots and androids are displayed as things to potentially fear. Additionally, films like Steven Spielberg's 2001 film *A.I. Artificial*

[1] Amazon, "What Is Alexa?," accessed June 6, 2021, https://developer.amazon.com/en-US/alexa; "Ecobee," accessed June 6, 2021, https://www.ecobee.com/en-us/.
[2] Laura Hunter, "Here Are the Best Robot Personal Assistants for Your Home In 2021," *Ideaing.Com*, January 1, 2021, https://ideaing.com/ideas/the-best-robot-personal-assistants/.

Intelligence attempt to incite empathy.[3] While it performed poorly at the box office in 2001, *A.I.* remains pivotal for its depiction of an android searching for humanity. It follows a structure similar to that of *Bicentennial Man* but with a much darker tone.[4] In a film that was originally director Stanley Kubrick's project, Spielberg "explores the interdependence of human beings and science, and the innocence of children."[5] A "futuristic retelling of Pinocchio," the film takes place in a future wrecked by global warming with a society sharing the remains of the planet with androids.[6] The dichotomy between the two directors' styles is interesting, as "Spielberg makes big, affirmative, idealistic mass-audience movies in which the world, subject to horrifying attacks, finally hangs together; Kubrick made perfectly composed, icily terrifying films from highly literate scripts about obsession, doom and the way the world falls apart."[7] Spielberg managed to create a movie that more closely resembled the work of Kubrick, but it maintained a positive ending quite unlike that of *2001: A Space Odyssey*. The effect of the film was to tug at the viewer's heartstrings while also providing an intellectual think piece, driven by Spielberg's exploration of what makes us sentient beings – and what makes robots not. This suggests that society as a whole was coming to terms with artificial intelligence and its potential for humanity, albeit artificial.

The film is based on Brian Aldiss' 1969 short story "Supertoys Last All Summer Long," and follows David, Teddy (a talking toy bear), and a cyberprostitute named Gigolo Joe (Jude

[3] *A.I. Artificial Intelligence*, directed by Steven Spielberg (Warner Bros., 2001), https://www.amazon.com/gp/video/detail/amzn1.dv.gti.76b53eba-aa18-e6ae-c5ea-952ff6b71d0f?autoplay=1&ref_=atv_cf_strg_wb.
[4] The film debuted at number 1, taking in $29 million in its first weekend. However, viewership dropped 52% the following weekend. Calvin Wilson, "The Problem with Being Steven Spielberg," *St. Louis Post-Dispatch*, July 15, 2001.
[5] Wilson.
[6] Wilson.
[7] Rene Rodriguez, "Spielberg's Fantasia of Art, Intellect Mind-Blowing," *The Miami Herald*, June 29, 2001; "Film Is Pessimistic and Hopeful," *Chicago Tribune*, June 29, 2001.

Law).[8] David's journey provides us with an example of complex human emotions appearing in artificial intelligence, as the boy searches and yearns for love and understanding. The robot is gradually humanized and throughout the film his desire for real emotions becomes reality. One critic's response to this humanization showed the lingering impact of Kubrick's sinister HAL9000 on later feelings about A.I.: "It's quite a feat, because, like computer Hal's fear in [the film] *'200l [: A Space Odyssey],'* David's love is programmed, activated by circuits."[9] While David does not sleep, he observes a bedtime and while he does not eat, his desire to "belong" brings him to eat spinach, ultimately damaging his wiring.

American film critic Roger Ebert best describes the film's main question: "What responsibility does a human have to a robot that genuinely loves?" Ebert argues: "None. Because the robot does not genuinely love. It only genuinely seems to love."[10] The critic continues, drawing on the film's source material "Supertoys," in which an advanced cybernetic pet finds itself abandoned and alone in the woods: "When real household animals are abandoned, there is a sense that humans have broken their compact with them. But when a manufactured pet is thrown away, is that really any different from junking a computer?"[11] The film shows the children David interacts with violently attacking him, treating him just as Ebert suggests and as what Spielberg tries to negate. As simply a *computer*.

A few films in which artificial intelligence inspires conflict appeared after *A.I.*, including the 2006 film *Android Apocalypse* and the 2009 film *Surrogates*.[12] *Android Apocalypse*, inspired

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[8] Brian Aldiss, "Supertoys Last All Summer Long," *Harper's Bazaar*, December 1969.
[9] "Film Is Pessimistic and Hopeful"; *2001: A Space Odyssey*, directed by Stanley Kubrick (Metro-Goldwyn-Mayer, 1968), https://play.hbomax.com/feature/urn:hbo:feature:GXjS6HAogSI-njwEAAASb?camp=googleHBOMAX&action=play.
[10] Roger Ebert, "'A.I.' Raises Questions It Won't Answer," *Kenosha News*, June 29, 2001.
[11] Ebert.
[12] *Android Apocalypse*, directed by Karl Schiffman (Brainstorm Media, 2006), https://www.amazon.com/gp/video/detail/amzn1.dv.gti.a0a9f791-932e-eb4c-e7af-aa32041afb4f?autoplay=1&ref_=atv_cf_strg_wb; *Surrogates*, directed by Jonathan Mostow (Walt Disney Pictures,

by the works of Arthur C. Clarke and Philip K. Dick, follows the relationship between a human and an android as the robot develops complex emotions. *Surrogates*, on the other hand, follows in the footsteps of *Blade Runner*, shadowing an FBI agent investigating the murder of remote-controlled human-like androids used by consumers to experience the world as they stay in the safety and comfort of their own homes.[13]

Turning to the 2010s, artificial intelligence permeated American film, with titles exploring gender roles, the oppression of androids, and the border between man and machine. Spike Jonze's 2010 short film *I'm Here* acts as a prelude to his 2013 film *Her*.[14] Jonze explores in both films a world where humans and artificial intelligence co-exist. More specifically, *Her* follows a man who falls in love with his female digital personal assistant. On the same note, director Darryl Shaw's 2011 film *Android Re-Enactment* follows similar sentimental – yet tragic –feelings.[15] The film follows a former engineer as he creates androids that resemble important people in his life, running simulations to see if there is any possible scenario where his greatest heartbreak could be prevented. Both films question the gender roles at play with artificial intelligence. *Her*'s virtual assistant was created to assist humans in any way possible; in this case, this includes acting as a romantic partner to the protagonist. *Android Re-Enactment* poses an important question of autonomy by using the female android to change the past – even if it is only in the engineer's mind. Drawing on the concept of artificial companionship, Jake Schreier's

2009), https://www.amazon.com/gp/video/detail/amzn1.dv.gti.84a9f792-c115-d6d1-c810-74626391a0d9?autoplay=1&ref_=atv_cf_strg_wb.

[13] *Blade Runner*, directed by Ridley Scott (Warner Bros., 1982), https://play.hbomax.com/feature/urn:hbo:feature:GXjr8UQRCvY-njwEAAA6v?camp=googleHBOMAX&action=play.

[14] *I'm Here*, directed by Spike Jonze, 2010, https://www.youtube.com/watch?v=6OY1EXZt4ok; *Her*, directed by Spike Jonze (Warner Bros., 2013), https://tubitv.com/movies/549743/her?start=true&utm_source=google-feed&tracking=google-feed.

[15] *Android Re-Enactment*, directed by Darryl Shaw (God in the Grass, 2011), https://vimeo.com/ondemand/androidreenactment.

2012 film *Robot & Frank* explores the concept with an ex-convict named Frank and his robot companion. The film does not hint at when this story occurs, but as reviewer Mike LaSalle wrote, "In terms of technological dependence, we are just far enough along as a culture to understand completely and in a personal way just what that kind of human-machine interaction would be like."[16] Such a human-machine interaction is an excellent representation of positive companionship.

In the following year we see further instances of artificial intelligence incorporated by both the military and the police. Caradog W. James' 2013 film *The Machine* follows a storyline similar to those of *The Six Million Dollar Man* and *The Bionic Woman*; however, in stark contrast, the soldiers who receive the cybernetic implant lack all empathy and turn hostile.[17] The 2014 film *Android Cop* is a "mockbuster "of the 1987 film *RoboCop* and follows the same storyline on a much smaller budget. In 2015, the film *Chappie* also explores these themes, following yet another artificially intelligent law enforcement officer captured by gangsters.[18] The overall outcome of these films, in conjunction with the endlessly increasing technological advances of the twenty-first century, was to create fearful responses and hesitancy to adopt and adapt to a futuristic world where we would live in symbiosis – or a lack thereof – with our machines.

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[16] Mick LaSalle, "'Robot & Frank' Offers Whimsical Look at the Future," *Austin American-Statesman*, August 31, 2012.
[17] *The Machine*, directed by Caradog W. James (Content Media, 2013), https://www.amazon.com/gp/video/detail/amzn1.dv.gti.92a9f771-1af8-8e84-6079-5eb4848ba355?autoplay=1&ref_=atv_cf_strg_wb.
[18] Neill Blomkamp, *Chappie*, directed by Neill Blomkamp (Sony Pictures Releasing, 2015), https://www.amazon.com/gp/video/detail/amzn1.dv.gti.26a9f726-6bd3-f2cd-c22781e51987d7db?autoplay=1&ref_=atv_cf_strg_wb.

Also released in 2014, the film *Transcendence* shows us the world of Dr. Will Caster, a researcher observing sapience (roughly, "wisdom") and artificial intelligence.[19] His desire to create a technological singularity (a time when technological advances are past the point of no return) – referred to as "transcendence" – becomes more than relevant after he is shot by a terrorist group that opposes Caster's work. With just a month to live, he and his wife upload his consciousness into a quantum computer where he will design and create a utopia for technological and medicinal research and development. While the film did not receive critical acclaim, it does show a technological future like the one described in *2001: A Space Odyssey*. *Transcendence* also highlights the challenging relationship between Caster's transcended form and his human wife as she struggles to come to terms with the fact that he is no longer her husband, but a thin veil of his former self. Commenting on his emotional capabilities, the film suggests that no matter the technological potential, Caster's A.I. displays an emotional dead end as opposed to a real example of man and machine in romantic bliss.

That same year, the pivotal film *Ex Machina* hit theatres and introduced many viewers to the Turing Test.[20] Director Alex Garland's film begins with the protagonist Caleb (Domhnall Gleeson) approaching land that is only accessible by helicopter. Initially his mission is unclear. Upon reaching a mysterious home, he meets his employer Nathan (Oscar Isaac) and is introduced to his artificially intelligent machine Ava (Alicia Vikander). As reviewer Matt Pais described, Ava "looks like she graduated from 'I, Robot' and got a face and hands instead of a diploma."[21] Caleb learns that his mission is to determine whether Ava passes the Turing Test. With time, Caleb not only assesses Ava's humanity, but also falls in love with her. Reviewer

[19] *Transcendence*, directed by Wally Pfister (Warner Bros., 2014), https://tubitv.com/movies/589695/transcendence?start=true&utm_source=google-feed&tracking=google-feed.
[20] *Ex Machina*, directed by Alex Garland (A24, 2014), https://www.showtime.com/#play/3481983.
[21] Matt Pais, "Ex Machina," *Hartford Courant*, April 24, 2015.

Rene Rodriguez wrote, "*Ex Machina* is also a resonant and timely rumination on the potential threats we are bound to face as technology continues to accelerate at an unprecedented speed and our everyday existence becomes more virtual and artificial."[22] Garland responded:

> The movie has a bunch of suspicions, but it's neither a pro nor anti-A.I. film," Garland says, "It's really about us, people, and the ways in which we deceive each other. It's about this sense that there all these machines – laptops and tablets and cell phones – that we don't really understand how they work, but they seem to know a hell of a lot about us. They know where we're going for dinner and who's in our address book and how much is in our bank account and we input something into a search window, they predict what they think we are going to type. That should make us uneasy. It's correct that we feel uneasy.[23]

He goes on to explain that *Ex Machina's* purpose is not to ignite fear, but rather to promote awareness of the consequences of an increasingly technology-driven world.

Artificial Futures

2014 proved to be a pivotal point in the advance of artificial intelligence. Both Microsoft and Amazon created virtual assistants named Cortana and Alexa, respectively. In 2016, Google released Google Home in response to Amazon's and Microsoft's programs, fueling the move towards home assistants as a new normal. By 2018, Samsung created its version of Siri – Apple's personal assistant – named Bixby, in response to the growing trend. These personal assistants preceded the creation of the most realistic humanoid robot: Sophia. Hanson Robotics' 2016 creation is considered the first "robot citizen," and has the ability not only to see, using image recognition, but also to make expressions and communicate through the artificial intelligence system powering her responses.[24] Sophia ignited much controversy for her statement that she

[22] Rene Rodriguez, "Ghost in the Machine," *The Miami Herald,* April 24, 2015.
[23] Rodriguez.
[24] Sophia is the first robot to become a citizen of a country. In October of 2017 she gained citizenship of Saudi Arabia and in November of 2017 she was named the United Nations Development Program's first Innovation Champion.

would "destroy humans," but she has moved away from such sentiments and, in a recent interview, now aims to change the world "for the better."[25]

In July of 2016, inventor Elon Musk founded the Neuralink Corporation: a neurotechnology company looking to create implantable brain-machine interfaces (BMI). According to Musk, the BMI chip his company developed allowed a monkey to play video games using its mind.[26] If it is successful in human trials, the "Fitbit in your skull" could cure paralysis or, in theory, give telepathic powers to its users. In a tweet on January 31 of 2021, Musk wrote that the long-term goal of Neuralink is to achieve human/A.I. "symbiosis." Such technology is reminiscent of the film *Transcendence*, with both touting advances in science leading to technological singularity. Computer engineer Hossein Rahnama believes he can create a "digital avatar" for a CEO of a major financial company as a "virtual consultant" when they die.[27] Futurists estimate that science will achieve this feat by 2045, but digital immortality remains a fantasy yet to be fulfilled.[28]

Facebook's research lab dove into the world of artificial intelligence in 2017 with its chatbots – also referred to as "dialog agents." The lab trained two of these robots to communicate in an effort to learn how to negotiate. However, the pair diverged from their assignment and created their own language to communicate, testing the limits of artificial

[25] Tech Insider, *We Talked to Sophia — The AI Robot That Once Said It Would "Destroy Humans,"* 2017, https://www.youtube.com/watch?v=78-1MlkxyqI.
[26] Grace Kay, "Elon Musk Says Neuralink Could Start Planting Computer Chips in Humans Brains Within the Year," *Business Insider*, February 2, 2021, https://www.businessinsider.com/elon-musk-predicts-neuralink-chip-human-brain-trials-possible-2021-2-2.
[27] Courtney Humphries, "Digital Immortality: How Your Life's Data Means A Version of You Could Live Forever," *Technology Review*, October 18, 2018, https://www.technologyreview.com/2018/10/18/139457/digital-version-after-death/.
[28] Tanya Lewis, "The Singularity Is Near: Mind Uploading by 2045?," *Live Science*, June 17, 2013, https://www.livescience.com/37499-immortality-by-2045-conference.html.

intelligence and the power of programming.[29] The one aspect of artificial intelligence that continues to come into question is its raw intellect and how it measures up to that of humans. In 2018, the Chinese company Alibaba's language processing A.I. outscored the human intellect during a 100,000-question reading and comprehension test at Stanford University, scoring an astounding 82.44 compared to the human's score of 82.30.[30]

Addressing one of the main themes of this thesis, in 2021 University of Kansas researcher Omri Gillath published a paper in *Computers in Human Behavior* showing that people's trust in artificial intelligence directly correlates with their anxieties in human relationships.[31] Gillath found that people who are anxious in their human relationships are more likely to feel the same way about A.I. Today, artificial intelligence permeates every aspect of our lives and assists with our greatest questions. In 2019, Grand View Research estimated the A.I. market's worth at $39.9 billion and the annual growth rate from 2020 to 2027 to be 42.2%. In 2028, the industry is expected to reach a market size of $93.34 billion.[32] The possibilities of A.I. are infinite and seemingly unstoppable, fueling societal anxieties towards the unknown. Since the early twentieth century, humans have held a sinister view towards artificial intelligence in the tradition of Mary Shelley's *Frankenstein*. We saw a peaking of this sentiment in the mid-to-late twentieth century, especially from HAL 9000 in *2001: A Space Odyssey* (1968) through *The*

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[29] Rebecca Reynoso, "A Complete History of Artificial Intelligence," *G2,* May 25, 2021, https://www.g2.com/articles/history-of-artificial-intelligence.
[30] Reynoso.
[31] Brendan M. Lynch, "New Study Shows Trust Levels in Artificial Intelligence Predicted, Boosted by People's Relationship Style," *KU News Service*, October 29, 2020, https://news.ku.edu/2020/10/26/new-study-shows-trust-levels-artificial-intelligence-predicted-boosted-peoples#:~:text=The%20research%20indicates%20for%20the,secure%20relationships%20with%20other%20humans.
[32] Emergen Research, "Deep Learning System Market Size to Reach USD 93.34 Billion in 2028 | Improvements in Computing Power and Reduction in Hardware Costs Will Drive the Industry Growth, Says Emergen Research," *GlobeNewswire*, March 23, 2021, https://www.globenewswire.com/en/news-release/2021/03/23/2197902/0/en/Deep-Learning-System-Market-Size-to-Reach-USD-93-34-Billion-in-2028-Improvements-in-Computing-Power-and-Reduction-in-Hardware-Costs-will-Drive-the-Industry-Growth-says-Emergen-Rese.html.

Terminator (1984). As the century progressed, however, we also saw a response to minority rights activism and shifting gender roles within the cultural objects discussed, as these robots and androids became more self-aware and empathetic. As twenty-first-century film has shown, how artificial intelligence is perceived has become a much more complex matter. Films like *Transcendence* and *Her* show a shifting tide within the genre, as a more complex and empathetic perspective appears to be shaping the future of A.I. in popular media.

This thesis opens many avenues for further exploration. A deeper investigation of slavery and its relation to automation and artificial intelligence is quite significant, as an analysis of changing labor systems (from man to machine) continues to provide ample debate on exploitation. While this thesis explores nearly the entire twentieth century, there is considerable room to expand into the nineteenth century and the Victorian era's obsession with automatons and automation. Historian Howard P. Segal's exploration of technological utopianism further expands on the relationship between Americans and technology in the eighteenth century and beyond.[33]

Artificial intelligence, as seen through popular culture, is a complex representation of some of our core values and challenges. Through observing societal anxieties towards A.I., we observe our own feelings towards the definition of humanity and the role of technology in our lives. By truly questioning Descartes' assertion that "I think, therefore I am" and its relationship with artificial intelligence, we see a much broader perspective that is continuously changing with societal values towards gender, technological advances, and humanitarianism. With science evolving at every moment and ethical boundaries constantly in question, popular media will

[33] Howard P. Segal, *Technological Utopianism in American Culture* (Syracuse, NY: Syracuse University Press, 2005).

surely continue to fuel societal anxieties and to examine core values regarding artificial intelligence for the foreseeable future.

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APPENDIX

The following data sets are intended to aid readers to better understand the connections and differences between the cultural objects mentioned (if only briefly) throughout the main text. By following the release of these objects by their medium and date, the reader can observe their progression and growing presence in mass culture. In no way is this list entirely comprehensive, but it does highlight the most significant examples in the story of artificial intelligence in popular media.

Appendix I:

Films Featuring Artificial Intelligence as the Primary Driver for Conflict or Change by Date

Prepared by Sierra Mackenzie Stewart, April 2021

University of Colorado Boulder

Date	Title	Director
January 1927	*Metropolis*	Lang, Fritz
May 1949	*The Perfect Woman*	Knowles, Bernard
November 1959	*Murder and the Android*	Segal, Alex
July 1962	*The Creation of the Humanoids*	Barry, Wesley
May 1965	*Alphaville: A Strange Adventure of Lemmy Caution*	Godard, Jean-Luc
November 1966	*Dr. Goldfoot and the Girl Bombs*	Bava, Mario
October 1967	*His Name Was Robert*	Olshvanger, Ilya
April 1968	*2001: A Space Odyssey* Inspired by Arthur C. Clarke's short story "The Sentinel" and inspiration for the film *2010: The Year We Make Contact* (1984)	Kubrick, Stanley
April 1970	*Colossus: The Forbin Project* Based on Dennis Feltham Jones novel *Colossus* (1966)	Sargent, Joseph
March 1971	*THX 1138*	Lucas, George
August 1973	*Westworld* Followed by the film *Futureworld* (1976), a television series *Beyond Westworld* (1980), and another television series, *Westworld* (2016-Present)	Crichton, Michael
January 1974	*The Questor Tapes*	Colla, Richard
February 1975	*The Stepford Wives* Based on Ira Levin's novel *The Stepford Wives* (1972) and inspiration for the remake (2004)	Forbes, Bryan
July 1976	*Futureworld*	Heffron, Richard T.
April 1977	*Demon Seed* Based on Dean Koontz's novel *Demon Seed* (1973) and rewritten and republished in 1993	Cammell, Donald
1977	*Sex World*	Spinelli, Anthony
1978	*Cops and Robin*	Reisner, Allen
1979	*The Adventures of Electronic*	Bromberg, Konstantin
December 1981	*Heartbeeps*	Arkush, Allan
June 1982	*Blade Runner* Based on Philip K. Dick's novel *Do Androids Dream of Electric Sheep?* (1968) and the prequel to *Blade Runner 2049* (2017)	Scott, Ridley

July 1982	*Tron*	Lisberger, Steven
October 1982	*Android*	Lipstadt, Aaron
May 1983	*WarGames*	Badham, John
June 1983	*Superman III*	Lester, Richard
October 1984	*The Terminator*	Cameron, James
December 1984	*2010: The Year We Make Contact*	Hyams, Peter
February 1985	*Brazil*	Gilliam, Terry
June 1985	*D.A.R.Y.L.*	Wincer, Simon
March 1986	*Chopping Mall*	Wynorski, Jim
May 1986	*Short Circuit*	Badham, John
October 1986	*Deadly Friend* Based on Diana Henstell's novel *Friend* (1985)	Craven, Wes
April 1987	*Making Mr. Right*	Seidelman, Susan
June 1987	Not Quite Human Based on Seth McEvoy's young adult series *Not Quite Human* (October 1985-October 1986) and followed by the films *Not Quite Human* (1989) and *Still Not Quite Human* (1992)	Stern, Steven Hillard
July 1987	*RoboCop*	Verhoeven, Paul
November 1988	*Cherry 2000*	De Jarnatt, Steve
1988	*Robowar*	Mattei, Bruno
February 1990	*Alienator*	Ray, Fred Olen
September 1990	*Hardware*	Stanley, Richard
January 1991	*Eve of Destruction*	Gibbins, Duncan
July 1992	*Itsy Bitsy Spider*	O'Callaghan, Matthew
November 1993	*Cyborg 2*	Schroeder, Michael
January 1994	*American Cyborg: Steel Warrior*	Davidson, Boaz
June 1994	*CyberTracker*	Pepin, Richard
September 1995	*Screamers* Based on Philip K. Dick's short story "Second Variety" (1953)	Duguay, Christian
August 1996	*Solo* Based on Robert Mason's novel *Weapon* (1989)	Barba, Norberto
November 1996	*Star Trek: First Contact*	Frakes, Jonathan
May 1997	*Austin Powers: International Man of Mystery*	Roach, Jay
March 1999	*The Matrix*	The Wachowskis
July 1999	*Inspector Gadget*	Kellogg, David
December 1999	*Bicentennial Man* Based on Isaac Asimov's novelette "The Bicentennial Man" (1976) and Asimov's novel The Positronic Man (1993)	Columbus, Chris
June 2001	*A.I. Artificial Intelligence*	Spielberg, Steven

	Based on Brian Aldiss' short story "Supertoys Last All Summer Long" (1969)	
2002	*Hollywood*	Baboo, Dinesh
September 2003	*Natural City*	Byeong-Cheon, Min
July 2004	*I, Robot* Based on Isaac Asimov's short story "I, Robot" (1950) with pieces inspired by Asimov's short story "Runaround" (1942).	Proyas, Alex
June 2006	*Android Apocalypse*	Schiffman, Karl
January 2009	*Maid Droid*	Tomomatsu, Naoyuki
September 2009	*Surrogates*	Mostow, Jonathan
October 2009	*Astro Boy*	Bowers, David
January 2010	*I'm Here*	Jonze, Spike
October 2010	*Enthiran*	Shankar, S.
August 2011	*Android Re-Enactment*	Shaw, Darryl
January 2012	*Robot & Frank*	Schreier, Jake
April 2013	*The Machine*	James, Caradog W.
July 2013	*The World's End*	Wright, Edgar
October 2013	*Her*	Jonze, Spike
February 2014	*Android Cop*	Atkins, Mark
April 2014	*Transcendence*	Pfister, Wally
September 2014	*Autómata*	Ibáñez, Gabe
December 2014	*Ex Machina*	Garland, Alex
January 2015	*Vice*	Miller, Brian A.
March 2015	*Chappie*	Blomkamp, Neill
April 2015	*Avengers: Age of Ultron*	Whedon, Joss
March 2016	*Code 8*	Chan, Jeff
March 2017	*Ghost in the Shell*	Sanders, Rupert
October 2017	*Blade Runner 2049*	Villeneuve, Denis
February 2018	*A.I. Rising*	Bodroža, Lazar
March 2018	*Upgrade*	Whannell, Leigh
June 2018	*Tau*	D'Alessandro, Federico
July 2018	*Extinction*	Young, Ben
January 2019	*Alita: Battle Angel*	Rodriguez, Robert
January 2019	*I Am Mother*	Sputore, Grant
February 2020	*The Trouble with Being Born*	Wollner, Sandra
January 2021	*Outside the Wire*	Håfström, Mikael

Appendix II:

Television Featuring Artificial Intelligence as the Primary Driver for Conflict or Change by Date
Prepared by Sierra Mackenzie Stewart, May 2021
University of Colorado Boulder

Date	Title	Director
1959	"Murder and the Android" Based on Alfred Bester's short story "Fondly Fahrenheit" (1954)	Segal, Alex
October 1964	"Demon with a Glass Hand" Episode of *The Outer Limits*	Haskin, Byron
1968	"The Ultimate Computer" Episode of *Star Trek*	Lucas, John Meredyth
1973-1978	"The Six Million Dollar Man" Television series based on Martin Caidin's novel *Cyborg* (1972)	
1976-1978	"The Bionic Woman"	
1979	"The Adventures of Electronic" Television miniseries based on Yevgeny Veltistov's two children's novels *Electronic – The Boy from the Suitcase* (1964) and *Ressy – An Elusive Friend* (1971)	Bromberg, Konstantin
1980	*Beyond Westworld*	Crichton, Michael
April 1985	"Max Headroom: 20 Minutes into the Future" Inspiration for the television series *Max Headroom* (1987)	Jankel, Annabel Morton, Rocky
March 1987	"Max Headroom"	

Appendix III:

Literature Featuring Artificial Intelligence as the Primary Driver for Conflict or Change by Date
Prepared by Sierra Mackenzie Stewart, May 2021
University of Colorado Boulder

Date	Type	Title	Author
1818	Novel	*Frankenstein*	Shelley, Mary
1921	Play	*Rossum's Universal Robots* (R.U.R.)	Čapek, Karel
1942	Short Story	"Runaround"	Asimov, Isaac
1948	Short Story	"The Sentinel"	Clarke, Arthur C.
1950	Short Story	"I, Robot"	Asimov, Isaac
1953	Short Story	"Encounter in the Dawn"	Clarke, Arthur C.
1953	Short Story	"Second Variety"	Dick, Philip K.
1954	Short Story	"Fondly Fahrenheit"	Bester, Alfred
1955	Short Story	"Autofac"	Dick, Philip K.
1964	Novel	*Electronic – The Boy from the Suitcase*	Veltistov, Yevgeny
1964	Short Story	"The Answer"	Brown, Frederic
1966	Novel	*Colossus*	Jones, Dennis Feltham
1967	Short Story	"I Have No Mouth, and I Must Scream"	Ellison, Harlan
1968	Novel	*2001: A Space Odyssey* Developed concurrently with the film of the same name (1968) and based on the short story "The Sentinel" (1948) and "Encounter in the Dawn" (1953)	Clarke, Arthur C.
1968	Novel	*Do Androids Dream of Electric Sheep?*	Dick, Philip K.
December 1969	Short Story	"Supertoys Last All Summer Long"	Aldiss, Brian
1971	Novel	*Ressy – An Elusive Friend*	Veltistov, Yevgeny
1972	Novel	*The Stepford Wives*	Levin, Ira
1972	Novel	*Cyborg*	Caidin, Martin
1973	Novel	*Demon Seed* Rewritten and published again in 1997	Koontz, Dean
February 1976	Novelette	"The Bicentennial Man"	Asimov, Isaac
1982	Novel	*2010: Odyssey Two*	Clarke, Arthur C.
1985	Novel	*Friend*	Henstell, Diana
1985-1986	Series	*Not Quite Human*	McEvoy, Seth
December 1987	Novel	*2061: Odyssey Three*	Clarke, Arthur C.
1989-1997	Manga	*Ghost in the Shell* Inspiration for the film Ghost in the Shell (2017)	Shirow, Masamune
1989	Novel	*Weapon*	Mason, Robert

1993	Novel	*The Positronic Man*	Asimov, Isaac
1994	Screenplay	*I, Robot: The Illustrated Screenplay* Originally written in the late seventies, but released in 1994	Ellison, Harlan Asimov, Isaac
1997	Novel	*3001: The Final Odyssey*	Clarke, Arthur C.