“The computer got it wrong”:

Artificial Intelligence and Race During the Cold War

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Introduction

In January of 2020, a 42-year-old man named Robert Julian-Borchak Williams was arrested outside of his home in Farmington, Michigan, after driving home from his work at an automotive supply company. His wife and two daughters watched as local police arrested Williams without any explanation and simply flashed an arrest warrant when questioned. After holding Williams overnight, two detectives interrogated him about a shoplifting case in a boutique near Detroit. The evidence included a photo from a surveillance camera that captured the suspect, a heavyset Black man in black clothing. Although both men were Black, the image was obviously not of Williams. When Williams held the surveillance photo up to his face during the interrogation, one of the detectives remarked "I guess the computer got it wrong."[1]

The Williams case demonstrated that facial recognition software, algorithms, and artificial intelligence exhibit racial biases and can lead to wrongful arrests. The case sparked a debate about implicit racism in artificial intelligence (AI). Although Williams's case was dropped, being aware of the histories of AI technologies is important to understand *why* AI gets – or can get – things so wrong, *who* is implicated, and *what* are these implications. In this thesis, I trace the history of AI in the U.S. through the analysis of the biases and prejudices in the early visions of AI and in the language used to describe them, along with the examination of the military-driven institutional structures that sustained these visions during the Cold War. I argue that the early visionaries of artificial intelligence held underlying cultural assumptions about race in the United States, and that these beliefs informed their research activities and ideas about AI. Specifically, in this thesis I foreground two sets of assumptions: the notion of a "universal human nature" and the belief that technology can fix societal problems. A belief in universal nature implies that all humans, regardless of differences in class, race, ethnicity, and gender, belong to

[1] Kashmir Hill, "Wrongfully Accused by an Algorithm," *New York Times*, June 24, 2020.

one culture and have widely shared experiences. This notion, while not endemic to the twentieth century, saw a resurgence in popularity in the wake of the world's condemnation of genocide carried out by the Nazi Germany during World War II. In the United States, a widely held liberal and progressive view of a universal human nature, however, marginalized diverse experiences of Black and Brown communities in particular, intentionally or unintentionally perpetuating the country's deeply-rooted history of racism and prejudice.

John McCarthy, the early pioneer of artificial intelligence and the founder of the Stanford Artificial Intelligence Laboratory (SAIL), is the case in point. McCarthy foregrounded his research in AI in his personal views on technology's role in society and his belief in a universal human nature. McCarthy, like many other scientists and engineers at the time, believed that technological fixes could cure society's misfortunes, ranging from poverty to street-level crime. While well-meaning, McCarthy's beliefs and his understanding of culture as "colorblind" was rooted in his experiences as someone belonging to the mainstream White, middle- and upper-class society in the United States. Furthermore, these beliefs complicated both the intentions behind and the envisioned goals of the Stanford AI Laboratory,

John McCarthy's research on artificial intelligence received a major boost in the supportive climate of the Cold War. McCarthy's main sources of funding for SAIL were tied to the U.S. Department of Defense. This was partially due to Stanford administrators' calls for the increased reliance on military contracts for research funding. Although McCarthy claimed, at times, that the Department of Defense instilled a "no strings attached" approach to their funding and contract process, the types of research projects that Stanford undertook were inextricably linked to the military-industrial complex. McCarthy's opinions on the legitimacy and fruitfulness of military funding at SAIL further informed his viewpoints on the counterculture and anti-war

movements at Stanford led by students and some faculty. As the recipient of the defense funding, McCarthy was reluctant (and, at times, defensive) to denounce Stanford University's ties with the United States military. McCarthy's views on accepting military patronage and the role of this funding in his AI research were indicative of what the historian Rebecca Lowen called the "Cold War University." While in the wake of the anti-war movement of the late 1960s many scientists questioned and denounced the "Cold War University," McCarthy continued to defend it.

The thesis is organized as follows. The first chapter provides a historiographic background. In the second chapter, I begin my analysis with the cybernetician Norbert Wiener's titular work, *Cybernetics: Or Control and Communication in the Animal and the Machine*. As the founder of cybernetics as a field, Wiener was very influential among the visionaries of the new information age. Despite the celebrity status of this foundational book, however, *Cybernetics* remains unexamined as a work containing underlying assumptions about non-White and non-Western cultures. Cybernetics, and Wiener's other work on cybernetics, is riddled with racialized conceptualizations of society and its inhabitants, an aspect which has yet to be explored by the historians of science. After discussing Wiener's work, the third chapter moves to the central protagonist of my study, John McCarthy, the founder of the Stanford AI Laboratory. I first examine McCarthy's early writings and theories that provide key insights into the intellectual frameworks that informed his research. In the fourth chapter, I examine SAIL in the context of the "Cold War University" and the backlash against this model of a university as it manifested itself at Stanford in the early 1970s.

Chapter 1. Historiography

1.1 Cybernetics and the Human Imagination

Cybernetics is the study of the relationship between computing machines and living things, particularly the human brain. The field of cybernetics was developed after World War II as a result of technological advances made by the Allied forces during the war. Cybernetic theorists in the postwar period proposed a link between automatic control systems in computers and the biological systems that govern life. Some notable and influential milestones within the field of cybernetics in the 1950s and 1960s included the "Elmer and Elsie" robot tortoises developed by Grey Walter, the Homeostat device built by Ross Ashby which possessed the ability to adapt to its environment and exemplify feedback mechanisms, and Gregory Bateson's double bind theory which proposed ideas on the origins of schizophrenia. In *The Cybernetic Brain: Sketches of Another Future*, British sociologist Andrew Pickering describes how British cyberneticians such as Walter, Ashby, and Bateson developed inventions and theoretical frameworks within the field of cybernetics after World War II. Alternatively, in *The Cybernetics Moment, Or Why We Call Our Age the Information Age*, the historian of science and technology Ronald R. Kline examines how cybernetics and information theory arose, as well as how these fields influenced the sciences more broadly. Both scholars are concerned with the development of cybernetics as a field; however, they possess different explanations for the broader implications of cybernetics.

While the origin of cybernetics is often described as developing from the United States military's research in mathematics and engineering after World War II, Pickering argues that the British cyberneticians were primarily focused on psychiatry and the human brain in the postwar period. Pickering additionally focuses on the ways in which cybernetics crossed paths with the

psychedelic sixties and the counterculture movement during the Cold War. In particular, he draws connections between psychiatry, cybernetics, and pharmaceuticals and how these fields were shaped by drugs in the 1960s. Through these connections, cybernetics, as a field, appears "nonmodern" in that it bridges the gap between humans and these historical connections.[2] Furthermore, Pickering contends that the history of cybernetics is intertwined with an eclectic view of the world as ripe for constantly changing novelty fueled by the views of the counterculture movement. Cybernetics, from this viewpoint, provides a means by which we can explore alternative ideas for the future. This history of the field as imaginative, therefore, starkly contrasts with pre-existing accounts of cybernetics as militaristic and bleak.

1.2 Cybernetics as the Vision of Society and its Future

In addition to viewing cybernetics as a field with limitless potential for the human imagination, cyberneticians also used these theories to envision a new, technologically-advanced future. Cyberneticians, in particular, believed that cybernetic theories could become a uniting force within the wider realm of technology. These theories centered around the feedback mechanisms of machines and their proposed ability to imitate biological processes which would, as cyberneticians argued, revolutionize the capabilities of computers. Moreover, the interdisciplinary nature of cybernetics also contributed to this "shared imagination" of the world in that cyberneticians believed in the field's ability to change the way scientists researched and developed machines.

Similar to Pickering's argument that cybernetics is grounded in a shared imagination of the world, Ronald R. Kline describes the popular belief that cybernetics and information theory possess the ability to bridge the gap between the social and hard sciences. Kline locates the

[2] Andrew Pickering, *The Cybernetic Brain: Sketches of Another Future* (Chicago: University of Chicago Press, 2011), 18.

growth of cybernetics within the burgeoning information age and argues that cybernetic theories were extremely influential in the development of modern technology. Additionally, he maintains that the early cyberneticians "shaped a language of feedback, control, and information that transformed the idiom of the biological and social sciences, sparked the invention of information technologies, and set the intellectual foundation for what came to be called the information age."[3] Moreover, Kline contends that the proliferation of cybernetics and information theory created a utopian image of the world that linked the sciences and the public after World War II.

While Pickering identifies the unifying connections that underlie the development of cybernetics, Kline focuses on the discord within the field. In particular, Kline argues that the discipline of cybernetics consisted of loosely related ideas and theories from a multitude of different fields of study, such as mathematics and psychiatry. By contrast, Pickering focuses on the promise of cybernetics to fulfill the imagined idea of a universal field. Furthermore, Kline's description of the "cybernetics moment" differs from Pickering's understanding of cybernetics history in that he situates the field within a complex, loosely-connected interlay of information theory and other disciplines outside of technology.

In *The Cybernetic Brain*, Pickering makes use of a variety of British cyberneticians' early works and theories to discuss the development of cybernetics. For example, Pickering analyzes these cyberneticians' work in a variety of fields including psychiatry, engineering, music, politics, and the counterculture movement. Similarly, Kline discusses the lives and work of early cyberneticians, particularly Norbert Wiener, Margaret Mead, and Warren McCulloch, in tracing the "cybernetics moment" during the early information age. Although both scholars utilize similar sources, Pickering and Kline formulate sometimes conflicting accounts of cybernetics

[3] Ronald R. Kline, *The Cybernetics Moment: Or Why We Call Our Age the Information Age* (Maryland: Johns Hopkins University Press, 2017), 1.

history. For example, both Pickering and Kline discuss the British cybernetician Ross Ashby's "homeostat" machine. While Pickering discusses this machine in relation to cybernetic theory on systems and the counterculture movement, Kline utilizes Ashby's work to discuss the seemingly conflicting subfields with a stake in cybernetics. In particular, Kline contends that the homeostat was interpreted in a variety of ways by different scientific disciplines. These sources, although similar, represent a point of contention between these two interpretations of cybernetic history.

These two accounts of the history of cybernetics provide main narratives of the beginning of artificial intelligence during the Cold War, particularly the field's connection to the end of the "cybernetics moment." In *The Cybernetics Moment*, Kline traces the branching off of artificial intelligence from cybernetics at the 1956 conference on early computers at Dartmouth College. Kline discusses how artificial intelligence developed from cybernetics because of a disagreement between "symbolic versus continuous [analog] systems" and "psychology versus neurophysiology."[4] While cybernetics was concerned with analogous modes of signal processing, including mathematical values and electric currents, early forms of artificial intelligence utilized symbolic representations of inputs that could be programmed and manipulated with a computer. Additionally, proponents of artificial intelligence believed that computers possessed the ability to imitate human intelligence. These capabilities, as argued by early visionaries of AI, were based on psychological theories. By contrast, cyberneticians utilized neurophysiology to explain how machines could represent the functions of the human brain. Furthermore, these theoretical areas of disagreement between the two fields led to artificial intelligence's eventual branching off from cybernetics, even though both areas shared historical and scientific similarities.

1.3 Artificial Intelligence

[4] Kline, 154.

The end of the "cybernetics moment" led to John McCarthy and other computer scientists developing the field of artificial intelligence. The two fields, while similar in their goals to create intelligent machines, diverged in their methodology. McCarthy, while inspired by cybernetic theories, branched off from the field by proposing methods of programming computers to create intelligent machines rather than building the robot-like constructions that Ashby, for example, developed. Additionally, the field of AI was influenced by the Cold War and the United States' militaristic aims. These factors, furthermore, led to the establishment of artificial intelligence as a prominent field within the sciences.

Although cyberneticians and proponents of artificial intelligence sought to build human-like computers, they utilized different procedures to do so. In *The Closed World*, historian Paul Edwards describes the split between cybernetics and AI, as well as the early life of McCarthy's field and the wider history of computers. Edwards argues that artificial intelligence was the final step in the evolution of cybernetics, and that it contrasted with cybernetics's usage of cognitive psychology. In particular, he points out that the goal of developing artificial intelligence was to create a mind through computer software, whereas cybernetics intended to create a brain through hardware. In this way, the field of AI aimed to use computer programming in order to mimic human intelligence and behavior. Furthermore, computers and AI were conceptualized as "second selves" for users to interact with, thereby operating as an extension of the person and their thoughts, ideas, and opinions.[5]

In addition to tracing the scientific and technical histories of cybernetics, AI, and computers, Edwards also discusses larger socio-political issues during the mid to late twentieth century in the United States. He contends that the history of computers and artificial intelligence

[5] Paul Edwards, *The Closed World: Computers and the Politics of Discourse in Cold War America* (Cambridge, MA: MIT Press, 1996), 259.

is deeply rooted in Cold War science and politics in that the goals of the United States' ideological war with the Soviet Union oftentimes overlapped with technological research.[6] In particular, Edwards argues that the development of AI became closely connected to the U.S. military's goal of human-machine integration.[7] Yet, the early visionaries of AI, including John McCarthy, who Edwards labels "AI insiders," admonished technological "progress" during the Cold War without considering social factors, including the implications of military research.[8] This cognitive dissonance created what Edwards coined "closed worlds": "disembodied AI, cyborg intelligence as formal model, thus constructed minds as miniature closed worlds, nested within and abstractly mirroring the larger world outside."[9] Thus, John McCarthy's early visions for artificial intelligence were inextricably linked to wider social events which influenced his writings and observations in the field. The broader context of the Cold War and its effects on McCarthy's work at SAIL is a starting point for my analysis.

1.4 The Cold War in Silicon Valley

The Stanford Artificial Intelligence Laboratory was shaped by its situation within northern California. Later known as "Silicon Valley," the conglomerate of suburbs in the San Francisco Bay Area became home to technology companies after World War II. Silicon Valley became synonymous with an idealized version of the "American Dream" as companies viewed technology as a prosperous venture. The United States military, in addition, took interest in Silicon Valley, as well as the numerous companies that began to grow. For the federal government, advancements in technology would fuel its technological race with the Soviet

[6] Edwards, viiii.

[7] Edwards, 240.

[8] Edwards, xi.

[9] Edwards, 256.

Union. Further, SAIL was influenced by its placement within Silicon Valley and the area's ties to the U.S. military.

During the postwar boom in northern California, early technological visionaries viewed the western part of the United States as a "new frontier." The historian of technology Margaret O'Mara analyzes the deeply rooted history of technological developments as they relate to this region. O'Mara captures the "frontier" atmosphere of northern California during the post-World War II era, particularly during the 1960s and 1970s. O'Mara argues that the very foundation of Silicon Valley relied on some of the institutions that its stakeholders critiqued the most: big government spending on research and development. She describes this conflict within Silicon Valley further:

> From the very beginning, then, there was a cognitive dissonance in the way America's postwar politicians and technologists talked about the world-changing upsides of high-tech investment – expanding the frontiers of knowledge, pushing out into the unknown, bettering society, furthering democracy – and the far more bellicose and disquieting reasons that this investment happened in the first place.[10]

As O'Mara argues, the technological advancements that became synonymous with Silicon Valley held multiple implications for society. In particular, the role of government spending affected the atmosphere of Silicon Valley, including the types of projects that were produced within it. This "cognitive dissonance" that came along with high-tech advancements in Silicon Valley prevented investors, technologists, and stakeholders alike from critically analyzing the institutions that allowed them to continue their research and development. O'Mara argues that this lack of awareness further affected Silicon Valley's industrious age:

> Yet the Valley's tight circle, born in an era when the worlds of engineering and finance were all-white and all-male, programmed in sharp gender and racial imbalances – and

[10] Margaret O'Mara, *The Code: Silicon Valley and the Remaking of America* (New York: Penguin Random House, 2020), 23.

> narrowed the industry's field of vision about the products it should make and the customers it could serve.[11]

As O'Mara contends, the makeup of Silicon Valley's brightest minds affected the types of technological advancements that they pursued. Moreover, O'Mara's understanding of Silicon Valley's situation in regards to the Information Age offers a more critical view of technology in the postwar period.

The sources of funding for the projects in Silicon Valley also held enormous influence over technological advancements, in addition to ideologies. The federal government's influx of spending in Silicon Valley was indicative of the broader context of the Cold War. The United States' race against the Soviet Union, in particular, led the federal government to search for new avenues for research and development, and Silicon Valley became a main target within the grander scheme of the Cold War. O'Mara contextualizes this influence further:

> New technologies and influential new players emerged in fields that not only built thinking machines but *connected* them to others: workstations and relational database software and computer networking. And amid all of this disruption was something that had been there from the start, had never really gone away, and that in the 1980s had become more influential – and, to some in the Valley, much more ominous - than it had been in several decades. It was the tech counterculture's original Big Brother: the computer powered federal government, and its very high-tech ways of making war.[12]

As O'Mara argues, the federal government's spending in Silicon Valley acted as a sort of "Big Brother" within the technological culture of the area. Part of the government's interest in Silicon Valley specifically centered around the vision of California as a "new frontier," which O'Mara contends contributed to the shift in funding sources. This envisioning of California as a place of new opportunities attracted both investors and inventors, as well as military funding. Moreover, O'Mara builds upon contemporary histories of artificial intelligence and computers by

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[11] O'Mara, 7.

[12] O'Mara, 244.

stressing the significance of Silicon Valley as a site for the military-industrial complex. The military's role in the beginnings of artificial intelligence also impacted AI research at prestigious universities, including Stanford.

The types of projects that artificial intelligence laboratories at different universities in the United States could pursue hinged on the U.S. military's financial support. In *Creating the Cold War University: The Transformation of Stanford*, the historian Rebecca S. Lowen also underscores the impact that military funding had on Silicon Valley, especially Stanford University. Lowen stressed that universities' newfound dependence on the federal government for research contracts was tied to the broader implications of the Cold War. Stanford University, in particular, transformed into a "Cold War University" as administrators brought in more defense contracts for faculty. Because of this shift, Stanford and other Cold War Universities had to balance between their "capacity to produce students and to innovate and society's needs for experts and for new knowledge."[13] Stanford University adapted to this vision for postwar research institutions, and faculty, researchers, and administrators alike viewed the Cold War University as a business model. For John McCarthy and the Stanford Artificial Intelligence Laboratory, the image of Stanford as a Cold War university allowed their research on AI to continue and flourish. However, the association of SAIL with the Cold War and military funding implicated McCarthy's research with the U.S. government's broader goals to compete with the Soviet Union technologically.

1.5 Gaps in the Historiography and Open Questions

The current literature surrounding cybernetics, artificial intelligence, and the Cold War provide key insights into how these technologies developed, particularly within the realm of a

[13] Rebecca S. Lowen, *Creating the Cold War University: The Transformation of Stanford* (Berkeley, CA: University of California Press, 1997), 148.

"Cold War University." However, the literature also neglects the importance of John McCarthy to the creation of artificial intelligence, as well as the ways in which racialized language shaped the field itself. The role of race in influencing these technologies is particularly important when considering *who* McCarthy envisioned AI for. Moreover, the literature fails to link these key factors within the history of artificial intelligence during the Cold War.

While Kline provides an in-depth analysis of how cybernetics shaped the information age, and vice versa, his focus on technical and scientific aspects prevents him from examining the broader implications of these newly developed technologies. Similarly, Pickering's retelling of the cybernetics "imagination" neglects the sociopolitical undercurrents that drove the creation of these new ideas. In particular, their analyses fail to incorporate the issue of race within the context of cybernetics and artificial intelligence. Early visionaries of such technologies envisioned a singular "humanity," but this vision was inspired by a desire to replicate society according to their own beliefs, lifestyles, and identities. Further, this idea of a "universal human nature" narrowly represented hegemonic ideals and theorists within the dominant, Western society. Moreover, early theorists shaped their visions of cybernetics and AI to represent their own "humanity," or people like themselves.

While Kline and Pickering both overlooked racialized ideas within the discourse of cybernetics and early artificial intelligence, other scholars pointed out that racial violence and injustices have shaped the development of certain technologies. The sociologist and historian of African diaspora studies Simone Browne utilized the lens of race, particularly in relation to Black Americans, to trace the intertwined history of surveillance technologies and transatlantic slavery. Browne analyzed enslavement practices in the early United States, including runaway slave notices and slave ships, to retell the history of the development of surveillance

technologies. She contends that the surveillance of Blackness is "often unperceivable" within the study of surveillance, however, the two are intricately intertwined.[14] Browne offers the frame of "dark sousveillance" to understand the racialized history of modern technology, which she defines as the "imaginative place from which to mobilize a critique that takes form in antisurveillance, countersurveillance, and other freedom practices."[15] Whereas Kline and Pickering ground cybernetic theory within the information age and the counterculture movement, Browne views similar technologies as rooted in the longstanding surveillance of Blackness, and the ways in which people in the U.S. have renegotiated this surveillance. Furthermore, understanding this important link between race in the United States and early visions of cybernetics and artificial intelligence is crucial to situating Norbert Wiener's usage of racialized language.

The existing literature does not present John McCarthy as a pivotal figure in artificial intelligence. Yet, McCarthy held enormous influence over the field of AI and computer science more broadly in his position as the head of the Stanford Artificial Intelligence Laboratory, one of the first AI labs in the U.S. and the world. As the recipient of large amounts of funding from the Department of Defense, and as one of the leading scientists at Stanford's "military-industrial-academic complex," McCarthy was a key figure in the field of AI during the Cold War. Further, McCarthy's own views of AI were shaped by his beliefs in a universal human nature and his experience as a proponent of the sociological debate.

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[14] Simone Browne, *Dark Matters: On the Surveillance of Blackness* (Durham, NC: Duke University Press, 2015), 22.

[15] Browne, 21.

Chapter 2. The Age of Cybernetics

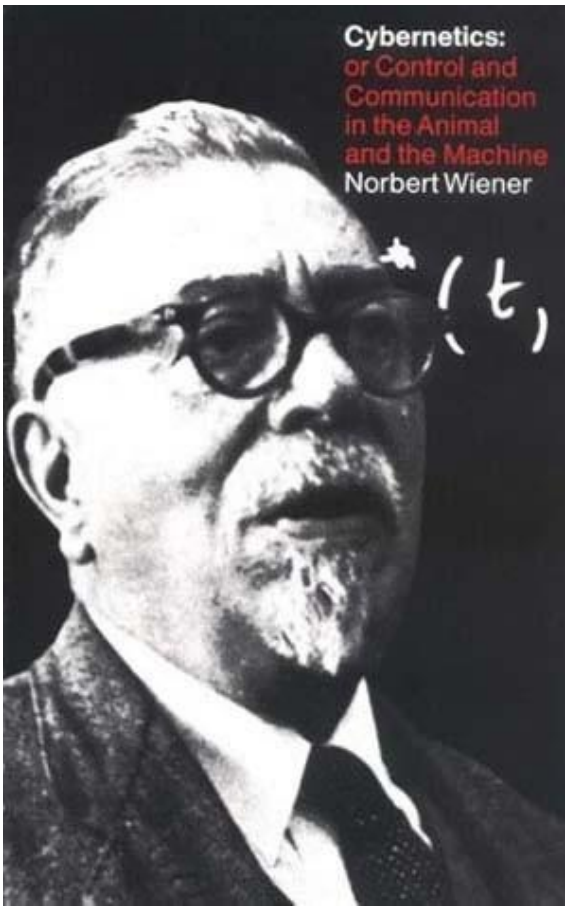

Figure 1. Wiener, Norbert. 1961. *Cybernetics: or Control and Communication in the Animal and the Machine*. Cambridge, MA: MIT Press.

Norbert Wiener, born in Missouri in the late nineteenth century, was a child prodigy in mathematics and later became a professor of mathematics at the Massachusetts Institute of Technology. Wiener conceptualized and coined the term *cybernetics*, which he defined as the field of control and communication theory that encompassed feedback mechanisms.[16] Wiener derived the word *cybernetics* from the Greek word xuéepyātm, meaning "steersman," to

[16] Norbert Wiener, *Cybernetics: or Control and Communication in the Animal and the Machine* (Cambridge, MA: Technology Press, 1948).

represent the circular feedback mechanisms involved with steering a ship.[17] A feedback mechanism, according to the field of cybernetics, marked any system's ability to change an output in response to an input or stimulus. Further, Wiener believed that intelligent behavior could be attributed to the language of feedback, and these mechanisms could be replicated by intelligent machines. The field of cybernetics is widely interpreted as an early precursor to modern forms of artificial intelligence. Wiener's theories were widely successful within multiple fields, including mathematics, philosophy, and psychiatry, which led to cybernetics's reputation as transdisciplinary. His 1948 book entitled *Cybernetics: Or Control and Communication in the Animal and the Machine* was critically acclaimed and boosted cybernetic theories in the overall language of science in the postwar period. In this chapter, I explore the kinds of language used to describe early visions of artificial intelligence by examining Wiener's cybernetic theories in his titular work. I argue that Norbert Wiener envisioned the field of cybernetics with a racialized understanding of technology's uses and the supposed "differences" between Western and non-Western civilizations. Moreover, Wiener's racialized visions of cybernetics, which laid the foundation for artificial intelligence, shaped the ways in which later theorists developed new technologies.

2.1 Norbert Wiener's Cybernetic Imagination

Norbert Wiener coined the term cybernetics in his 1948 work, *Cybernetics: Or Control and Communication in the Animal and the Machine*. In *Cybernetics*, Wiener discussed this link between computers and living things, and in doing so, he established cybernetics as a potential point of interest for those developing early computers in the post-World War II era. Throughout this material, Wiener laid the groundwork for the field of artificial intelligence (AI) in his comparison of the human brain to computing machines. In particular, he drew parallels between

[17] Wiener, 19.

humans' ability to think and automatic, self-regulated control systems in computers. While Wiener was an early visionary in the fields of cybernetics and AI, he also utilized language indicative of the field of eugenics, including racialized comparisons of human societies. Moreover, while *Cybernetics* was a pioneering work in cybernetics and AI, it simultaneously laid the groundwork for eugenic ideas in these burgeoning fields of interest.

As a cybernetician, Norbert Wiener was influenced by racialized ideas when he envisioned the uses of future technologies. Within *Cybernetics*, Wiener proposed that automated control systems developed by cybernetics possessed the potential to become the next source of "slave labor" for human civilization.[18] This labor would reap significant economic rewards for the first mass developers of such systems. While Wiener recognized the advantages of cybernetic computing machines that operate autonomously, he also questioned what this new technology would mean for humans and if these systems would be able to fully replicate the human brain. Wiener explored answers to these questions and ultimately argued that while it would be possible to develop a thinking machine comparable to human intelligence, it would be inconceivable to develop a computing machine that supersedes human intellect. This conclusion represents Wiener's overall argument – while cybernetics is a viable field for exploring the future of intelligent machines, the field itself has limitations.

Wiener and his cybernetic ideas were extremely influential in the broader fields of mathematics and computer science. Throughout *Cybernetics*, Wiener made use of his extensive knowledge of mathematical and philosophical concepts to appeal to a broader, technical audience. In particular, Wiener intended for technologically-informed academics and scientists to understand the themes displayed in this material. Wiener discussed the various mathematicians,

[18] Wiener, 37.

early cyberneticians, and computer scientists he worked with to establish the field of cybernetics, including Vannevar Bush, a professor of electrical engineering at the Massachusetts Institute of Technology and the director of the U.S. Office of Scientific Research and Development during World War II.[19] By discussing his collaborators, Wiener revealed his purpose in publishing *Cybernetics* – to justify the need for further interdisciplinary interest in the burgeoning field of cybernetics, and to call on fellow intellectuals to lead this research.

2.2 Race, Society, and Cybernetics

Norbert Wiener discussed parallels between societies and self-regulating mechanisms in machines using racialized language and phrases. In the chapter "Information, Language, and Society," Wiener referred to "savages" to draw a comparison between supposedly "civilized" and "uncivilized" societies. He contrasted these two types of societies to create a distinction between countries that were developing advanced computing technologies after World War II, and those that were not.

> Suppose I find myself in the woods with an intelligent savage, who cannot speak my language, and whose language I cannot speak. Even without any code of sign language common to the two of us, l can learn a great deal from him. All I need to do is to be alert to those moments when he shows the signs of emotion or interest. I then cast my eyes around, perhaps paying special attention to the direction of his glance, and fix in my memory what I see or hear. It will not be long before I discover the things which seem important to him, not because he has communicated them to me by language, but because I myself have observed them.[20]

This comparison between understanding machine language and conversing with a "savage" reveals Wiener's attitudes toward eugenics, a field of study that advocates for improving the human species through a careful selection of desirable traits, and race in general. Wiener's assertion that learning from a "savage" human society is possible, even for civilized,

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[19] Wiener, 19.

[20] Wiener, 183.

cybernetically-informed intellectuals, is indicative of the time. While the end of World War II in 1945 and the conclusion of the Nuremberg Trials resulted in the eugenics movement being largely discredited, racialized ideas of human societies carried over into the postwar period. Some of these ideas included imperialistic and paternalistic beliefs about the West's duty to teach so-called "savages" about Western and "proper" civilization. These views reflected within Wiener's writings implicate the cybernetician, or technologist more broadly, as the paternal figure within the pioneering field of cybernetics. Further, this envisionment of the paternalistic cybernetician involves teaching the "savage" and assisting them in becoming literate in future technologies. Moreover, Wiener's understanding of a "savage" society represents this holdover of eugenic ideas and a legacy of racialized undertones in the early development of cybernetics and artificial intelligence.

In continuation of this comparison to understanding a "savage," Wiener drew parallels between "civilized" and "primitive" societies.

> Thus small, closely knit communities have a very considerable measure of homeostasis; and this, whether they are highly literate communities in a civilized country, or villages of primitive savages. Strange and even repugnant as the customs of many barbarians may seem to us, they generally have a very definite homeostatic value, which it is part of the function of anthropologists to interpret.[21]

In this passage, Wiener described these "strange" and "repugnant" customs of "barbarians" in order to distinguish them from Western society, a superpower in the fields of technology and military advancements during the war. By creating this distinction, Wiener continued to associate racialized ideas of the "other" to non-Western societies. This viewpoint exemplified Wiener's assumptions of who, exactly, is modeled by futuristic technologies; Western civilization, therefore, becomes the standard for cybernetics and artificial intelligence because of these racialized ideas. This standard, in turn, created a sense of Western intellectual

[21] Wiener, 187.

superiority that informed Wiener's groundwork in the field of cybernetics. Furthermore, Wiener's usage of these eugenic and racialized ideas is inherently interwoven with his early theories on cybernetics.

During a lecture held at the University of California, Los Angeles sponsored by the Engineering department in 1949, Norbert Wiener further discussed his predictions for "mechanical slave labor" and expanded on his theories presented in *Cybernetics*. Wiener proposed that the mass production of robots would lead to the development of a new type of "slavery" that could be utilized for economic gain. He also argued that another world war would fuel the production of these robots, leading to shifts in the demographics of the United States's labor force. Wiener mused about how these "slaves" might be used within society, as well as the speed at which new technologies might be developed.

> It's none too soon to consider how we shall use such slaves. Because they are bound to make many types of human labor worthless. Billing clerks and similar categories of workers will have to look for new jobs… It's hard to realize it, but the increase in speed of transportation from the ox cart to the V-2 rocket is as nothing when compared to the increased speed in solving our problems mechanically. Solution of problems has been speeded up millions of times.[22]

The usage of the word "slaves" connotes Wiener's underlying assumptions about what the future of technology holds for the United States, as well as other societies. In particular, the meaning of "slavery" within a Western context holds a racialized history. Further, Wiener's comparison of cybernetic technologies to slave labor both at this conference and within *Cybernetics* suggests that these racialized beliefs informed his visions for "universal" human society.

The implications of a new form of slave labor on society, as detailed by Wiener, would involve widespread unemployment. While mulling over the solutions to this issue, Wiener

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[22] William S. Barton, "Chemical Brains for Robots Seen," *Los Angeles Times*, May 28, 1949.

argued that there would have to be a "revaluation of man's services," or the "killing of a lot of people."[23] Since the latter solution seemed "impractical," Wiener contended that humankind must reconsider their position within societies, the implications of power, and the "human problem."[24]

> This problem is that, while we are mad about 'know how,' we have forgotten to do any thinking about 'know what.' In other words, people are drunk with what they have been able to do, but refuse to think about what they should do. Power is worshipped without any inkling of where power is leading. If we don't develop responsibility in science and other fields we are in for trouble. We have got to develop our characters or get off the earth. Human and mechanical brains can give us logic and mathematics. But men need more than that.[25]

Wiener's idea of "responsibility" within the burgeoning fields of cybernetics and technology was interconnected with his idea of the development of human character. These beliefs represent a narrow vision of what a universal human society is supposed to replicate, according to Wiener's internal view of himself. Further, this "responsibility" in solving what he described as the "human problem" also recalled his earlier arguments on the differences between "savages" and civilized society in *Cybernetics*. The duty to reevaluate humankind, therefore, is held by Western civilizations and according to Western ideals of what constitutes humanity and civility. Moreover, Wiener's envisionment of the "human problem," and cybernetics's potential to solve it, implicated his place within a privileged group of Western society and created a stand-in for all societies.

Conclusion

Although eugenics was largely discredited as a scientific field after World War II, certain themes from eugenicists' ideas continued to influence scientific discovery, including the

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[23] Barton.

[24] Barton.

[25] Barton.

development of cybernetics. In *Cybernetics*, Norbert Wiener discussed early theories of cybernetics in order to call on other academics and scientists researching early computers to consider links between the human brain and computing machines. To develop his argument, Wiener utilized multiple examples of human societies, particularly civilizations of "savages" and "barbarians." While Wiener used these examples to explain similarities in understanding computing languages and human languages, his word choice also represented a continuation of eugenics within scientific fields, particularly cybernetics and early ideas of artificial intelligence. Furthermore, because Wiener grounded his early work on cybernetics with these comparisons, he also established a link between technological advancement and eugenics.

Norbert Wiener utilized racialized language to envision cybernetics and futuristic technologies, leading to a simplistic worldview of who these technologies were intended for. This language included references to non-Western civilizations as "barbarians" and "savages" which reflected Wiener's underlying assumptions about who, exactly, qualified as "civilized." Additionally, Wiener's references to the potential for cybernetics to create "mechanical slaves" revealed the legacy of race, particularly blackness within the context of the United States, in technology. These ideas, in turn, hold implications for the field of artificial intelligence, particularly since the study of AI formed as a result of Wiener's early theories. Moreover, Wiener and the field of cybernetics, including its racialized connotations, laid the groundwork for artificial intelligence studies.

John McCarthy, in particular, was inspired by the field of cybernetics and Wiener's early works on the subject. McCarthy, a computer scientist and the founder of the Stanford Artificial Intelligence Laboratory (SAIL), coined the term "artificial intelligence" at the 1956 Conference on Artificial Intelligence at Dartmouth College in Hanover, New Hampshire. McCarthy, in

particular, held an appreciation for cybernetics and detailed multiple theoretical observations within his own works.[26] Before the conference at Dartmouth, McCarthy fielded numerous early papers on cybernetic theories and invited cyberneticians, including Norbert Wiener, to curate a debate between cybernetics and the burgeoning field of artificial intelligence. In proposing this conference, McCarthy detailed a "nascent split" within the field of cybernetics caused by theoretical differences, and he later had to contend with this divide by proposing artificial intelligence as an entirely separate field of inquiry.[27] The Dartmouth conference did not go according to McCarthy's plan. Some participants invited by McCarthy did not attend the conference, including Wiener, leading to a lack of representation for cybernetics theorists. However, the meeting marked an important turning point in the field of artificial intelligence as technologists split away from analogous systems in cybernetics and towards symbolic AI. Furthermore, McCarthy sprouted an increased interest in artificial intelligence and, conversely, a decline in the usage of the term "cybernetics."

While John McCarthy envisioned the field of artificial intelligence as a separate discipline from cybernetics, his inspiration for AI included more than technical and scientific observations that were borrowed from Wiener and cybernetics. McCarthy, similar to Wiener, proposed artificial intelligence theories with governing ideas of race and roles within society. His view of a "universal" human society, while applied to theories on AI, was not entirely different from that of Norbert Wiener. In the next chapter, I explore exactly how McCarthy described his early visions of artificial intelligence, and what language he used in his writings. Additionally, I analyze how McCarthy's visions were influenced by the broader forces of the Cold War and the United States military. Moreover, McCarthy's visions reflected a continuation of Wiener's

[26] Kline, *The Cybernetics Moment.*

[27] Kline, 159.

racialized language and were, at times, fundamentally tied to institutional support systems, including the U.S. military.

Chapter 3. John McCarthy: An Early Visionary of AI

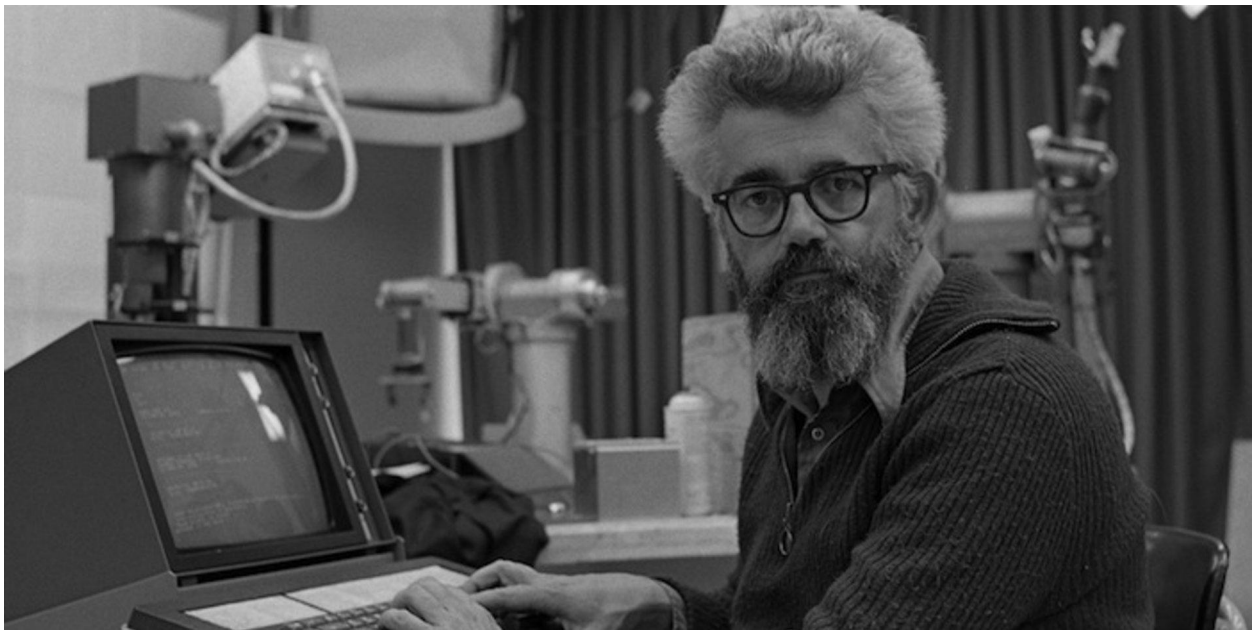

Figure 2. Painter, Chuck. 1974. *John McCarthy, professor of computer science in the artificial intelligence lab at Stanford in 1974*. Stanford Engineering.

The idea of autonomous machines capable of completing tasks is deeply-rooted in both science and science fiction. In 1898, Nikola Tesla revealed the first radio-controlled vessel at an exhibition, proving that scientific advancements could yield such machines.[28] In 1921, the Czech writer Karel Čapek coined the word "robot" in his theatrical play *Rossum's Universal Robots*.[29] However, in the summer of 1956, the Dartmouth College assistant professor of mathematics John McCarthy coined the term "artificial intelligence" in a proposal that he wrote along with Alan Turing, Marvin Minsky, Nathaniel Rochester, and Claude E. Shannon. This was the first documented time in which someone had defined artificial intelligence as a field of inquiry by which scientists worked to intertwine biological functions and the performance of human tasks

[28] Edwards, *The Closed World*.

[29] Edwards.

by machines. The proposal was intended for the Dartmouth Computers Conference of 1956 which was later known as the penultimate event in the founding of artificial intelligence as a field. McCarthy envisioned the field of artificial intelligence as a mode by which computers could accomplish tasks for the human user. His foundational work in the field of artificial intelligence fueled the technological imagination of the late twentieth century. In particular, his visions of artificial intelligence as a tool for social good inspired a generation of technologists and imagination for the use of technology. Additionally, McCarthy founded the Stanford Artificial Intelligence Laboratory which emerged as an influential research center in what will become known as Silicon Valley in the late twentieth century.

While McCarthy and the other founding members of AI were inspired by the field of cybernetics and Norbert Wiener's theories, the two fields had some theoretical differences. While cybernetics focused on interdisciplinary concepts of feedback and systems and the replication of these principles via technological means, artificial intelligence sought to use computers to imitate human intelligence and behaviors. McCarthy was among those who conceptualized these differences while viewing cybernetics as the springboard for artificial intelligence.[30] While planning the Dartmouth conference, McCarthy's research statements indicated that he aligned more with the "symbolic" interpretation of AI, rather than the neurophysiological understanding of brain modeling as proposed by cybernetic theorists.[31] Through symbolic reasoning, McCarthy believed that machines could be programmed mathematically to perform tasks. Further, McCarthy articulated these differences by arguing that the purpose of artificial intelligence was

[30] Kline, *The Cybernetics Moment.*

[31] Kline, 154.

to create an intelligent machine comparable to a human. In his early writings, McCarthy stressed this point:

> We shall say that a successful thinking machine has been designed when the machine can carry out any task which is commonly regarded as an intellectual one with success equivalent to that of an intelligent human. This standard, while high, does not require the machine to be able to solve any intellectual problem which may be formulated.[32]

In addition to his establishment of artificial intelligence as a separate and new field, McCarthy tied in his personal views on technology's role in society, including its use for law enforcement, human enhancement, and population control. These personal views were grounded in McCarthy's underlying cultural assumptions about human society, which stemmed from his position as a part of the dominant culture in the United States. In particular, McCarthy believed that technological advancements could fix societal ills. While most of his early ideas about the potential for artificial intelligence to solve social problems were well-intentioned, McCarthy's views superimposed his understanding of society as one "universal human nature," or the belief that all humans share a distinct cultural experience in life despite genetic variations. The notion of a singular human race was further complicated by the fact that McCarthy envisioned these new technologies by implicitly having himself as standing proxy for all of American society. Yet, McCarthy's visions for technology and society in the U.S. intertwined with his underlying biases as a White, middle class man. Like many of his contemporary Americans with broadly conservative views, McCarthy believed that the development of surveillance technologies would help law enforcement impose social control; conversely, McCarthy viewed criminalization in the United States as a good thing, and he saw nothing wrong with accepting military funding to boost both military technologies and civilian science. Moreover, McCarthy's early visions for the field of artificial intelligence were grounded in his beliefs that society's ills could be cured by

[32] Early Notes 1946-1956 by John McCarthy, 1946-1956, Box 27, Folder 25, John McCarthy Papers, Stanford University Archives, Stanford, California.

technological advancements, as well as his underlying assumptions about humankind more broadly.

3.1 "Down with anti-earthman propaganda!": Population Control and Human Enhancement

McCarthy's perception of a universal human nature impacted *how* he envisioned artificial intelligence, and *what* he believed AI technologies should be used for. One issue of particular importance to McCarthy was population growth, specifically the worry that Earth's population would exceed its capacity and amount of resources. He believed that the growing population was an issue, but to a certain extent. In "Technology and the Enhancement of Man," he discussed this point:

> Population must be limited. The U.S. could postpone this limitation for 100 years and still live well off resources from within its own borders. In other countries the problem is more acute, but they have to see the problem themselves as they in fact are; neither by precept nor by example nor by pressure can we make them do it. What we can do is provide technology.[33]

McCarthy acknowledged that, in his view, growing populations posed a threat to resource usage. However, he believed that this issue was solvable, specifically through technological advancements. In accordance with his vision of a universal human nature, McCarthy believed that technology could be used to solve social problems, including what he considered to be rampant population growth in the aftermath of World War II. This viewpoint held paternalistic understandings of society, particularly in that McCarthy viewed the United States and the Western world as "saviors" through technological advancements. Additionally, McCarthy argued that the West was exempt from the same issues that plagued other countries, including resource limitations, by virtue of its own advancements and abilities to delay the effects of population growth. Further, this view of technology and artificial intelligence as something that could cure

[33] "Technology and the Enhancement of Man" by John McCarthy, 1973, Box 3, Folder 4, John McCarthy Papers, Stanford University Archives, Stanford, California.

societal ills was indicative of McCarthy's technological optimism, as well as the cultural assumptions underlying his views of the world.

McCarthy expressed his opinions on population growth more succinctly in a later essay, "Human Population and its Limits."

> Overall population trends in a country do not take into account differential fertility of subgroups. White protestants are declining, and maybe white catholics also. Jews are declining except for the ultra-orthodox who are increasing. Mormons are increasing rapidly. Blacks and hispanics have higher fertility than whites. Along a different dimension the eugenics movement claimed that low IQ people increase while high IQ people decline. There are recent statistics on this, but the subject is substantially tabooed among social scientists.[34]

In this passage, McCarthy wrote about the fertility rates among different racial groups. Additionally, he pointed out how, according to proponents of eugenics, there are relationships between IQ and birth rates. More specifically, McCarthy argued that people with lower IQs have higher fertility rates, and vice versa for individuals with higher IQs. The statistics that McCarthy referred to, however, established links between levels of education and fertility, not necessarily IQ. Further, by pointing out the fertility rates within certain racial groups and establishing a supposed link between IQ and birth rate, McCarthy implicitly contended that race, IQ, and fertility rate are also connected. This racialized view of who, exactly, belongs to a "low" IQ group compared to the "high" IQ group upholds eugenic theories, as he referred to. McCarthy's bluntly stated associations between IQ and race represent a realm of science focused on sociobiological debates concerning intelligence. Sociobiology centered on ideas about biological determinism, or the notion that inherited, genetic traits lead to social and economic differences between groups of people, including among different races, genders, and classes.[35] However, the

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[34] John McCarthy,"Human Population and Its Limits," Professor John McCarthy, Stanford University, 1998, http://jmc.stanford.edu/commentary/index.html.

[35] Stephen Jay Gould, *The Mismeasure of Man* (New York: W. W. Norton & Company, 1981).

sociobiological debate, as well as McCarthy's linkage of IQ and race, draws upon two main fallacies: reification and ranking.[36] The reification fallacy misconstrues abstract concepts into something concrete; in this case, McCarthy and sociobiologists treated intelligence as though it were something innate and biological, rather than multifaceted. Additionally, the ranking fallacy stipulates that societies undermine "complex variation" in the name of progress.[37] In this particular passage, McCarthy conceptualized intelligence as something that would progress over time with societal advancements, as was the case for White Americans; however, this assumption does not address the intricate experiences of historical racism that governs scientific progress, including the concepts of intelligence and IQ. Moreover, in this particular argument, McCarthy expressed more explicit views on race and sociobiology, rather than implicit biases.

In addition to outlining his views on population growth, McCarthy wrote about ideas on the enhancement of man. Above all, he contended that the goal of enhancement is "human survival" and "enhancing human capabilities and potentialities."[38] Some of these ideas for enhancement include "transformation of humanity by ai, exploration and occupation of the universe, occupation of the solar system, [and] population growth."[39] McCarthy believed that these "transformations" could be achieved through technological advancements. Technology, in this view, was understood as a means by which change could be enacted and carried out. Since McCarthy's ultimate goal of human enhancement was survival, his ideas took on an evolutionary perspective. In particular, McCarthy's writings indicate that he viewed technology as the next

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[36] Gould, 56.

[37] Gould, 56.

[38] "Technology and the Enhancement of Man" (39), John McCarthy Papers.

[39] "Technology and the Enhancement of Man" (40), John McCarthy Papers.

step in the evolution of human society; therefore, McCarthy imposed utilitarianist conceptualizations of technology and early AI in his visions for society.

In his writings on enhancing man, McCarthy further expressed his distaste for "anti-earthman propaganda."[40]

> Imagine a literary opus to be modified by having all the characters given Italian names and superficial traits. (or Jewish or Negro). If the work would then be considered anti-Italian, we shall say that the work in its original form is anti-Earthman. The analogy is superficial, because the motivation is generally different.[41]

In this idea, McCarthy described what he views as "anti-Earthman." He argued that if stereotypes were applied to a certain ethnic or racial group in a published work, then the work would be regarded as discriminatory towards this group. However, McCarthy re-negotiated this understanding of ethnic and racial categories to group all humans into one human race, the "Earthman." Further, this understanding of ethnic and racial identities as trivial to the omnipotent, universal human race revealed McCarthy's assumptions about society. His belief in the universality of human nature, in this way, simplified the social and moral issues implicated in technological advancements. McCarthy continued with this discussion of "anti-Earthman propaganda."

> Prizes are offered for completing the following sentence in 250 words or less: "White-middle-class-baiting is OK while red-baiting or Jew-baiting or n***er-baiting is not, because…" Just because someone says "we" in an article deriding an American middle class custom doesn't mean that the article isn't just an expression of irrational prejudice and snobbery. Much left-wing and ecological propaganda has this character.[42]

In this commentary, McCarthy lamented "leftist" ideas, which he associated with anti-Earthman views. He argued that this "propaganda" is hypocritical in its discussions of racial

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[40] "Technology and the Enhancement of Man" (51), John McCarthy Papers.

[41] "Technology and the Enhancement of Man" (51), John McCarthy Papers.

[42] "Technology and the Enhancement of Man" (51), John McCarthy Papers.

prejudice and stereotyping. However, this argument failed to acknowledge the historical and social factors that affect the racism and discrimination that marginalized groups experience compared to the experiences of White Americans (see Browne). Additionally, McCarthy assumed that these experiences are universally shared by all racial groups, leading to his grouping of all races into one human nature. Moreover, McCarthy's envisioning of the "Earthman" and one human race superimposed his underlying cultural assumptions about race and society in the United States, and more broadly, the world.

Similarly to other early visionaries of AI and cybernetics, John McCarthy viewed technology as a way to solve social issues within the United States and other societies. In *Technology and the Enhancement of Man*, he stated it bluntly that "the best way to solve a moral problem is to make it a technical problem."[43] McCarthy's views have been indicative of the climate surrounding technology during the Cold War.

3.2 Early Ideas on Surveillance Technology

John McCarthy envisioned the field of artificial intelligence as a new and revolutionary site for technological research and advancement. McCarthy, similarly to Norbert Wiener, held particular views about humankind that influenced his theories on artificial intelligence, such as ideas on population growth, human enhancement, and surveillance technologies. Surveillance technology was one of the areas that swept through the early field of artificial intelligence. While the idea of surveillance itself was not endemic to the pioneers of cybernetics and artificial intelligence in the twentieth century, the application of technology to the monitoring of people and potential suspects of crimes took on a new meaning in the minds of early AI visionaries.

[43] "Technology and the Enhancement of Man" (51), John McCarthy Papers.

John McCarthy, in particular, conceptualized the use of technology for surveillance, especially through cameras and tracking devices. In *Technology and the Enhancement of Man*, McCarthy discussed his ideas on how technological advancements could benefit society. He theorized that "surveillance of streets by TV cameras that store what they see and make it viewable only in case of trouble will make the streets safe."[44] Similarly, McCarthy proposed using photographs, video recordings, and tracking devices to surveil other potential crimes, including violence against hitchhikers or people walking down a street.[45] In addition to surveillance cameras and recordings, McCarthy also suggested tagging bullets and guns with radioactive isotopes in order to track who bought bullets used in criminal activities, as well as to eliminate money and accept credit cards universally with attached photographs of the card owner. These were other methods McCarthy theorized that would assist in making the "streets safe" and reducing crime. McCarthy was well-meaning in idealizing technology and artificial intelligence for surveillance as he believed that these technologies would make American society safer overall, but his ideas for surveillance were grounded in his own understanding of a universal human nature. These underlying assumptions, moreover, heavily influenced what he believed these technologies could be used for, and who surveillance technology would protect.

Conclusion

Ultimately, McCarthy suggested using these new surveillance technologies in tandem with law enforcement in order to provide more evidence for police to use in possible crimes.[46] Additionally, he argued that wiring police officers would aid in the accumulation of evidence

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[44] "Technology and the Enhancement of Man" (11), John McCarthy Papers.

[45] "Technology and the Enhancement of Man" (28), John McCarthy Papers.

[46] "Technology and the Enhancement of Man" (29), John McCarthy Papers.

against possible suspects of crimes.[47] Yet, McCarthy neglected to acknowledge the implications of using such technologies within society. McCarthy's visions for surveillance technology were limited in that he viewed surveillance as a necessary good for all of society without understanding its implications and historical connections to the policing of marginalized communities (see Browne). These ideas for the usage of surveillance and, more specifically, the potential for artificial intelligence in surveillance technologies, underscore his privileged standpoint within the wider realm of researching such technologies. Furthermore, McCarthy's innate assumptions about society in turn reveal his understanding of a universal human nature in which one privileged individual (himself) would stand as a proxy for the entirety of society.

McCarthy's privileged position in society affected how he viewed humankind, ultimately leading to his belief in a singular, universal human nature, what he referred to as the "Earthman." In this view, McCarthy believed that all humans, regardless of race or class, could be united. McCarthy neglected to acknowledge that what some view as a "moral problem" differs from society to society, and even within societies themselves. This view of moral problems, therefore, changes between cultures and is subjective itself. McCarthy's idea to solve these issues through technology also showcased his argument that one human culture and nature exists and is prevalent throughout the world. Additionally, McCarthy believed that surveillance technologies should be used in coalition with law enforcement which further revealed his narrow understanding of human society. Moreover, while well-intentioned, McCarthy's conceptualizations for the uses of technology were based on his own experiences as a privileged member of society, therefore imposing himself as the stand-in and representative of all humankind.

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[47] "Technology and the Enhancement of Man" (29), John McCarthy Papers.

Chapter 4. Founding an AI Lab at a "Cold War University"

The burgeoning field of artificial intelligence reflected broader social contexts within the United States during the Cold War. In particular, the Department of Defense's interest in AI was tied to the overall competitive research environment caused by the surmounting fears of the Soviet Union's technological superiority. The Stanford AI Laboratory's foundation was based upon these defense interests, leading to AI research containing military-oriented goals. The field of artificial intelligence and the Department of Defense's involvement in the Cold War experienced a symbiotic relationship: AI research gained traction during this period, and the U.S. military became a formidable opponent for the Soviet Union. Moreover, the "military-industrial-academic complex" at Stanford University drove new visions for the field of AI.

Government spending on research and development increased in Northern California after World War II as the United States sought to outpace the Soviet Union in terms of technological advancements. The cities of San Francisco, San Jose, and surrounding areas, later known as Silicon Valley after its development of the silicon transistor, were viewed as an optimal location for research activities by the U.S. government due to its quiet and isolated location. Military contractors believed that Silicon Valley was more hidden from city centers which made it inconspicuous to the Soviet Union. Additionally, the Soviet Union's launch of *Sputnik 1* into outer space in 1957 caused U.S. policymakers to panic, and President Eisenhower agreed to increase R&D spending to outpace the Soviets. This influx of spending led to the development of the Advanced Research Projects Agency (ARPA) and the National Aeronautics and Space Administration (NASA).

The creation of ARPA and NASA, as well as the increase in defense funding of both military-related and fundamental research, produced what the historian Rebecca Lowen aptly called the "Cold War University."[48] The "Cold War University" welcomed government contracts for military research, primarily in the sciences and mathematics departments, and this became a widespread model of a research university in the United States in the 1950s and 1960s. The Cold War University model had long-lasting effects on the status of non-STEM disciplines and the transformation of research activities at universities. The government contracts at these universities legitimized the merging of military application research into the realm of civilian science. Further, the highly contested use of military funding since the late 1960s created an antagonistic environment towards certain research projects at these universities. It was precisely this model of a Cold War University and its military patronage in the early Cold War that allowed the field of artificial intelligence to flourish in the later stages of the Cold War.

The Stanford Artificial Intelligence Laboratory was founded in 1963 by John McCarthy after he moved from the Massachusetts Institute of Technology. McCarthy started SAIL with ambitious ideas in mind about technology's place in society, many of which were probed and conceptualized in the laboratory during its early years of operation. Among McCarthy's projects were a mainframe for users that would improve the human computer interface, as well as the concept of time-sharing. These projects were funded by ARPA and the Department of Defense. In this chapter, I examine exactly where the funding for SAIL came from, and how this funding affected McCarthy's research. I argue that the funding's origins affected the types of projects that McCarthy was involved in, and that his proposals aligned with the U.S. government's goals in the broader context of the Cold War.

4.1 Stanford University and the Cold War

[48] Lowen, *Creating the Cold War University*.

The Cold War played a pivotal role in both the research activities and the political climate at Stanford University. Specifically, the Department of Defense's funding of research, primarily in the sciences, led to backlash from students and some faculty members. This point of contention concerned the United States' involvement in the Vietnam War; the anti-war movement during the 1960s opposed the war on moral and economic grounds. While anti-war advocates were outraged over the effects of the U.S. military's occupation of Vietnam during this period, they also argued that defense spending on military applications of research diverted funding for social services that were enacted by President Lyndon B. Johnson's Great Society. For these students and faculty involved in the anti-war movement at Stanford, the defense funding of research activities represented social injustices. John McCarthy and the Stanford AI Laboratory had to contend with these conflicting themes of defense spending and the anti-war movement.

Stanford University transformed into a "Cold War University" during the post-World War II economic boom. Fred Terman, the dean of Stanford University's School of Engineering and son of eugenicist Lewis Terman, worked as an influential visionary for Stanford University during this period of high government spending after World War II. Terman built the Stanford Industrial Park which allowed the university to lease its land to industrialists in Silicon Valley. He viewed the Industrial Park as a site for "steeples of excellence" at Stanford, including revolutionary research.[49] Stanford began receiving funding for research activities from the United States' Department of Defense, leading to the university being known for its ties to the Cold War. The park, combined with the Stanford administration's willingness to receive funding from the U.S. military, transformed the university into a hub for the military-industrial complex. Being labeled as a "Cold War University" meant that Stanford transitioned from funding research

[49] Lowen, 150.

through the university's endowment and private donations to relying on government contracts. The Department of Defense mainly secured contracts with faculty in the science and mathematics departments at Stanford, including John McCarthy's own Stanford Artificial Intelligence Laboratory (SAIL) that I discuss in detail below. This led to the gradual de-funding of the humanities departments at Stanford and new money for projects within the sciences.

The political climate at Stanford University during the height of the Cold War was accentuated by the United States' involvement in the Vietnam War, especially in the late 1960s and early 1970s. The anti-war movement was particularly enticing to college students who demanded free speech on campus, and Stanford's student population was no exception. While anti-war demonstrations and protests circled the campus and Silicon Valley, an increasing number of student groups also began to question the role of the military funding at universities. John McCarthy transitioned into his role as the head of SAIL during this tense political moment as political activists at Stanford challenged the institution's status as a Cold War University.

4.2 Establishment of the Stanford AI Lab

John McCarthy's ambitious ideas for the Stanford AI Laboratory depended upon the Department of Defense, in particular, its monetary support. When founding SAIL within Silicon Valley, McCarthy joined other technological entrepreneurs who viewed the area as a "new frontier." The defense spending contributed to this idealistic vision of Silicon Valley, as well as McCarthy's ability to keep SAIL afloat. However, McCarthy also had to grapple with the effects of the Department of Defense's patronage of the AI research and the resulting anti-war sentiments on Stanford's campus. I argue that this funding was instrumental in McCarthy's success at SAIL and held significant influence over the types of research projects that he was allowed to pursue as stipulated by the Department of Defense.

In 1962, after a successful career at the Massachusetts Institute of Technology (MIT) and Dartmouth College, John McCarthy accepted an offer of a full professorship at Stanford University. At MIT, McCarthy helped to create the AI research institute, or Project MAC. At Stanford, he was instrumental in the founding of the rival institution, the Stanford Artificial Intelligence Laboratory in 1966. As one of the founders of the field of artificial intelligence, McCarthy had numerous groundbreaking discoveries in relation to the field. Some of these discoveries and advancements included the primary programming language for AI, LISP. Eventually, SAIL would become one of the most prominent centers for AI research. McCarthy was one of the first to create time-sharing systems which allowed multiple users to work on a single computer simultaneously. Further, these time-sharing technologies were early precursors to cloud computing, an innovation that is still used in the present day. How did this remarkable institution come into being?

The establishment of a new laboratory at Stanford hinged on the funding, but McCarthy knew where to go and ask for support: the Department of Defense (DOD), specifically, its research outreach, ARPA. In retrospect, McCarthy justified his turn to the military funding of a university laboratory by the allegedly little oversight on the projects these defense agencies funded. McCarthy explained this point in an interview with researcher William Aspray:

> Basically, once we got the money they never criticized or attempted to influence what we did with it. The way they worked is that you submitted this rather detailed proposal. Then the statement of work was always a very short thing. It was actually associated with the contract. They never gave all the money asked for, of course. But they never said, "Well then, what shouldn't you do? What should you leave out?" So basically, I would say that we were not closely supervised. We did what we thought best. But I did very little of that. I don't think I did anything or supported anything that was not contained in our proposals. Of course, some things that weren't mentioned were auxiliary to the things, but I didn't consider it as a kind of general computer science thing.[50]

[50] William Aspray, "An Interview with John McCarthy" (10), 1989, CBI Oral Histories, Charles Babbage Institute, Minneapolis, MN.

McCarthy did not believe that military funding at Stanford had any effect on the research at the institution itself. In this interview, McCarthy stressed that the United States' government held little influence over the principal investigators and their projects once the research itself was approved and funded. According to McCarthy, the Department of Defense and ARPA supervised research at SAIL, as well as other universities across the United States, with a "laissez-faire" approach. Yet, this funding still played a crucial role in both the types of projects that garnered approval, as well as McCarthy's abilities to do such projects. Because the government had such little oversight on the projects they funded, McCarthy and other AI researchers were able to execute their projects in the manner they saw fit. Further, even if the Department of Defense and ARPA had little oversight as McCarthy claimed, this funding still afforded early visionaries of artificial intelligence with more free reign over their ideas and imaginations for the field of AI. These ideas and visions for artificial intelligence, moreover, were indirectly influenced by the military's intervention into civilian science, regardless of their approach to oversight.

In the 1970s, the Department of Defense began to push for research projects related to the development of weapons. In this same interview with Aspray, McCarthy described the shift in the types of projects that ARPA funded:

> About 1970 they got increasingly short range. "What are you going to do for us now? In the next two years?" Furthermore, they abolished robotics, or at least they claimed to abolish robotics on the grounds that, "That's production and we want things that go bang." ARPA has gone through several cycles in terms of its willingness to support non-weapon activities of the Defense Department.[51]

According to McCarthy, the U.S. government became especially interested in supporting research that contributed to the rapid militaristic expansion during the Cold War. Additionally, McCarthy pointed out that, according to the Department of Defense, research on robotics became

[51] Aspray, 12.

increasingly less important to the government's Cold War visions. For McCarthy and SAIL, this push from ARPA and the Department of Defense to fund only weapons-related proposals when using the defense funds impacted the types of projects that they were able to pursue. However, the U.S. government and its entities continued to support the research activities at SAIL headed by John McCarthy. In fact, McCarthy's circumscription research was funded by ARPA, and the introduction to his research paper in February of 1980 indicated this:

> This research was supported by the Advanced Research Projects Agency of the Department of Defense under ARPA Order No. 2494, Contract MDA903-76-C-0206 and National Science Foundation. The views and conclusions contained in this document are those of the authors and should not be interpreted as necessarily representing the official policies, either expressed or implied, of Stanford University, or any agency of the U.S. Government.[52]

Although McCarthy included this acknowledgement, he also admitted that "DARPA was the main supporter" of his artificial intelligence research at SAIL.[53] Additionally, McCarthy claimed that he and ARPA "handled different things in different ways," indicating that both McCarthy and the Department of Defense were able to maintain their autonomy when overseeing research projects.[54] While ARPA allowed McCarthy to navigate his projects without their approval after the initial proposal stage, the agency still maintained a significant amount of control over which projects were funded. Moreover, the Department of Defense viewed SAIL and McCarthy's theories as important to the arms race against the Soviet Union as well as to the United States's scientific advancements, whether or not his research was related to weapons.

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[52] "Circumscription – A Form of Non-Monotonic Reasoning" by John McCarthy (2), 1980, Box 4, Folder 20, John McCarthy Papers, Stanford University Archives, Stanford, California.

[53] Aspray, 9.

[54] Aspray, 9.

In the early 1970s, the Stanford Artificial Intelligence Laboratory, with most of its funding coming from the Department of Defense and ARPA, became a target of the anti-war movement. John McCarthy, as the head of SAIL, paid special attention to the anti-war sentiments amongst student and faculty groups on campus. He retained multiple documents, including newspaper clippings, letters, and pamphlets, concerning the debate over military funding at Stanford, now kept in his personal papers at the Stanford University Archives. In one such letter, dated April 20, 1972, the Stanford University Political Action Group and the Associated Students invited McCarthy to participate in a discussion "concerning research and other activities related to war at Stanford":

> The many activities relating to war at Stanford in our view influence the character and function of the University. One aspect is the asserted dependence of the University budget upon substantial funds from the Department of Defense. We do not believe that assertion has been proved, nor do we consider that alternatives have been vigorously sought. In any event, there is no doubt that this is a central issue for the University… The recent intensification of bombing in North Viet Nam we consider to be a logical outcome of government policy. University policy is analagous [analogous] to government policy in many of its assumptions and objectives. Just as the integrity of the government is reduced by the bombing, so is the integrity of the University which has been instrumental in the development of weapons now being employed.[55]

Contrary to what McCarthy asserted in his interview with Aspray, a number of faculty and students at Stanford were concerned with the university's ties to the Department of Defense and the military's possible influence. As indicated by this letter to McCarthy, faculty and student groups at Stanford University viewed the military's collision with research activities as a point of contention. The Stanford University Political Action Group and Associated Students' conflation of university and government policy indicated that both students and faculty believed that military research at Stanford tarnished the university's reputation because of the Vietnam War.

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[55] Impact of Military Research on University by John McCarthy, 1972, Box 27, Folder 6, John McCarthy Papers, Stanford University Archives, Stanford, California.

Additionally, these sentiments reflected the overall anti-war atmosphere at Stanford, as well as the general pushback against the military-industrial-academic complex and the "Cold War University." This letter was sent to John McCarthy precisely because he was a principal investigator of the lab on campus funded by the Department of Defense.

To the concerns over military funding expressed in this letter, McCarthy responded with "I shall attend and will defend the propriety of the Artificial Intelligence Project assuming the "formal discussion" permits this."[56] The emphasis on "formal discussion" indicated that McCarthy was skeptical of this debate over military funding and its role at Stanford University. As the recipient of such funding that propelled the Stanford AI Laboratory to the forefront of technological research in the United States, McCarthy was perturbed by the letter's insinuations, and he had no sympathy towards the anti-war activism on campus. McCarthy believed that he would need to defend the viability of SAIL's research activities against the perceived threat of anti-military and anti-war activism. To be sure, McCarthy defended the usage of military funds for research on campus mostly because of the Department of Defense and ARPA's sponsorship of his own projects.

[56] "Impact of Military Research on University," John McCarthy Papers.

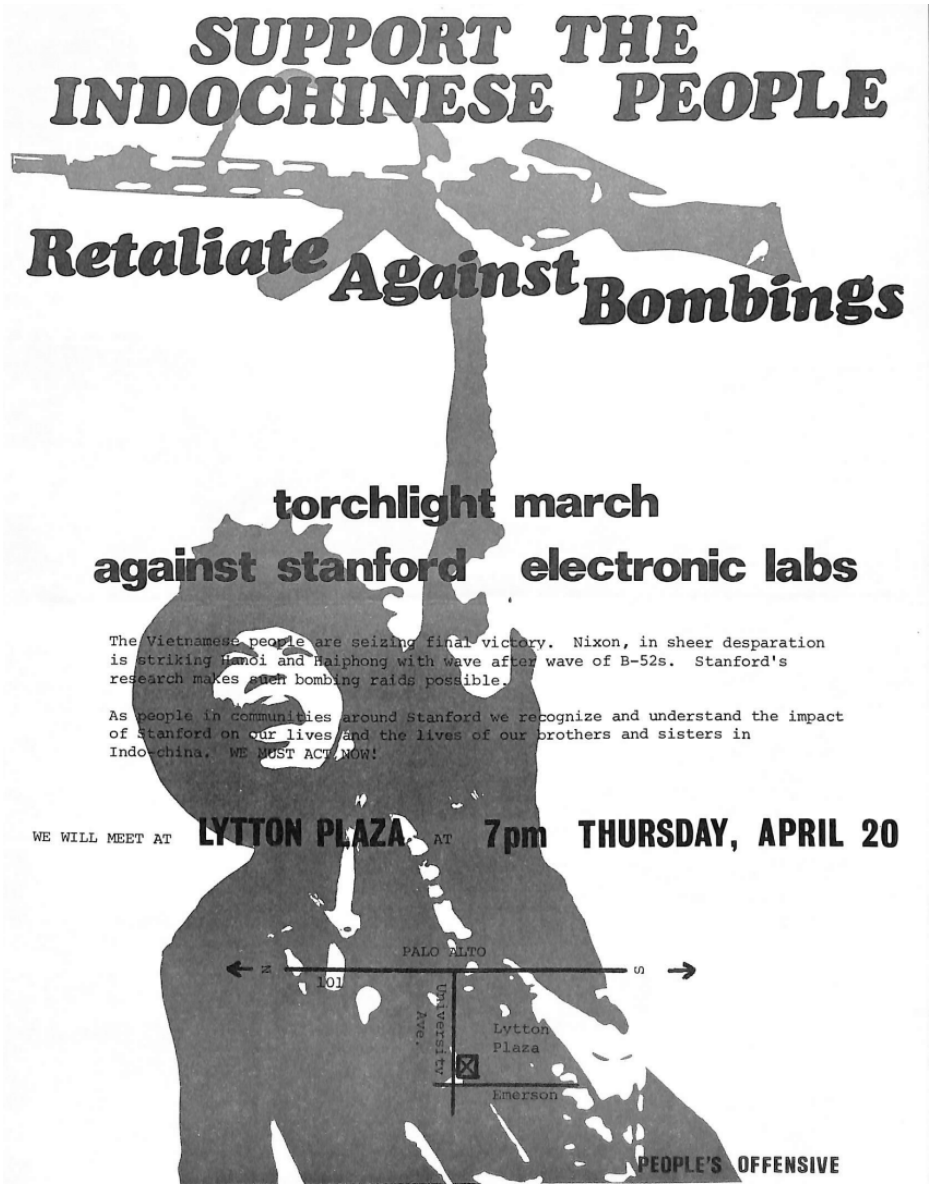

Figure 3. Flier for the "Support the Indochinese People" rally, 1972, Box 27, Folder 6, John McCarthy Papers, Stanford University Archives, Stanford, California.

McCarthy was keenly aware of the anti-war activism on campus, particularly as it related to Stanford's academics. In addition to the letter from Stanford faculty and students, McCarthy collected materials related to the anti-war movement on the Stanford campus. Among these materials were pamphlets circulated by the Stanford Workshops on Political and Social Issues (SWOPSI), a student-run organization. In the winter semester of 1971, SWOPSI organized

multiple workshops for Stanford students that focused on current events. The pamphlets included a description of SWOPSI's mission:

> Students see few connections between courses being offered and the problems of our society – the outrageous influence of the military… the pollution and destruction of the environment… the increasing polarization of young and old into inimical "generations"... Stanford Workshops on Political and Social Issues offer students an opportunity within the university to study some of these problems, and to translate their concern and frustration, through intensive study and investigation, into concrete and hopefully effective action.[57]

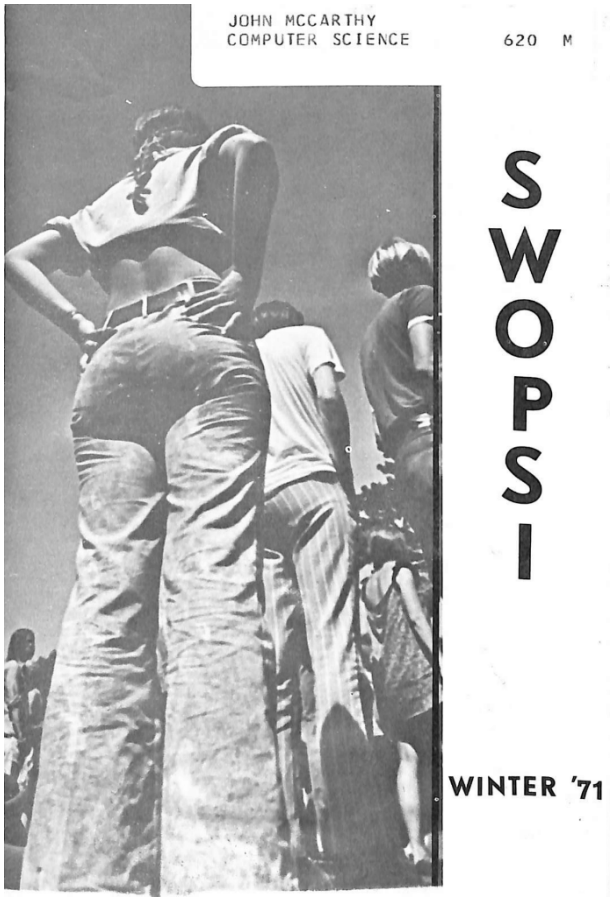

Figure 4. Photograph of the Stanford Workshops on Political and Social Issues (SWOPSI) pamphlet, 1971, Box 4, Folder 33, John McCarthy Papers, Stanford University Archives, Stanford, California.

[57] Politics by John McCarthy (93), 1970-1977, Box 4, Folder 33, John McCarthy Papers, Stanford University Archives, Stanford, California.

Some of the SWOPSI workshops' topics included climate change, mass incarceration, teaching, nuclear waste disposal, and other political events. At the end of the pamphlet, a page asked for suggestions and volunteer instructors to teach a SWOPSI course. McCarthy, however, left this page blank and devoid of any notes. The content of the SWOPSI workshops, as well as SWOPSI's mission statement, contradicted McCarthy's own deeply-seated beliefs on the role of military funding in research at Stanford University. Yet, his retainment of the SWOPSI pamphlet indicated that he was interested in the general political environment on campus. As a staunch supporter of defense funding at Stanford, McCarthy's interest in SWOPSI and the overall anti-war movement was perhaps motivated by a desire to retain ARPA's support of SAIL. Without ARPA and the DoD, the Stanford AI Lab had a shortage of funding due to the university's outsourcing of contracts. McCarthy, as the head of SAIL, was aware of this, and he actively worked to maintain the laboratory's ties with the U.S. government.

4.3 Military Funding and Humanoid Machines

The AI projects at SAIL aligned with the Department of Defense's goals and John McCarthy's own beliefs about technology's uses in society. In particular, McCarthy's projects focused on the potential for machines to build upon human capabilities and become the "next step" in human evolution. These capabilities involved hand-eye coordination and speech recognition which were important aspects in creating autonomous, humanlike machines. For the Department of Defense, this AI research represented an important turning point in the Cold War, specifically their arms race against the Soviet Union. Further, I argue that McCarthy's AI research on humanoid machines reflected the Department of Defense's aims in the Cold War.

Some of the projects at the Stanford Artificial Intelligence Laboratory that were funded by the U.S. Department of Defense focused on the enhancement of computers and AI

technologies. One such project that was started initially by John McCarthy researched "hand-eye systems."[58] According to the project's abstract, the "hand-eye work in the Stanford Artificial Intelligence Project is aimed at bringing together the perception and manipulation processes to perform interesting tasks."[59] This particular project involved training a computer to perform simple tasks, including sorting and stacking objects. McCarthy wrote that the main goal of the project was to "develop computer-hand-eye systems that are better for some purposes than human systems. For example, they may be faster, stronger, more economical, or more expendable."[60] Ultimately, McCarthy aimed to create computers that improved upon humans' biological mechanisms. This particular project, as well as others similar to it, indicated that McCarthy was interested in enhancing human functionality through technological advancements. McCarthy's research on developing hand-eye coordination in computers and robots was possibly related to ARPA's interest in autonomous weapons. Creating computer systems with motor skills would have allowed the U.S. military to operate from a far distance remotely. Moreover, this particular project contributed to ARPA's technological race against the Soviet Union, as well as any potential military conflict with other nations.

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[58] "Stanford Artificial Intelligence Project" by John McCarthy (4), 1968, Box 48, Folder 4, John McCarthy Papers, Stanford University Archives, Stanford, California.

[59] "Stanford Artificial Intelligence Project" (4-1), John McCarthy Papers.

[60] "Stanford Artificial Intelligence Project" (4-1), John McCarthy Papers.

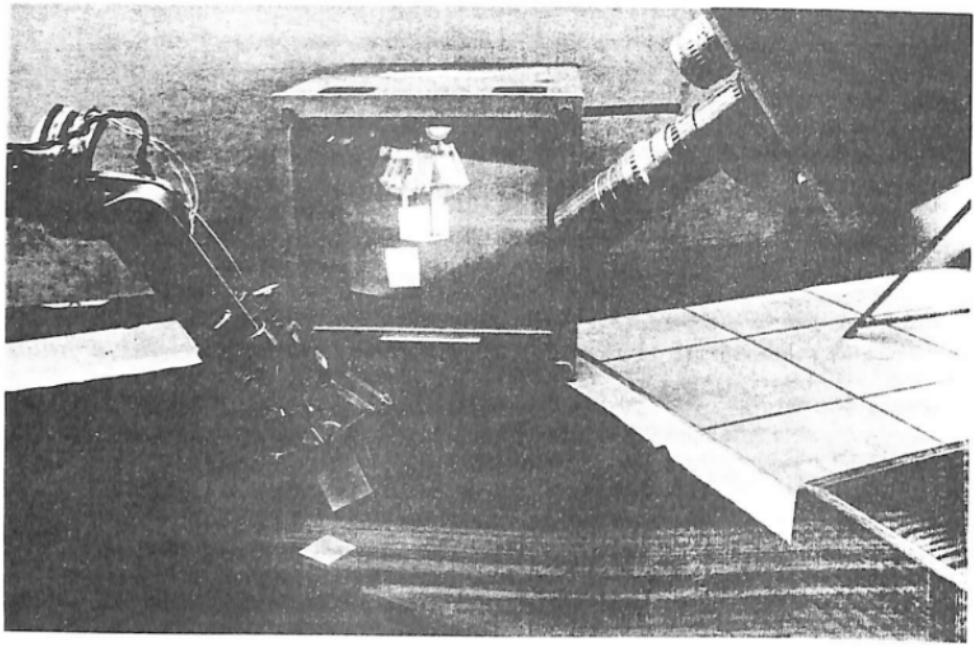

Figure 5. Photograph of the hand-eye equipment at SAIL, September 1968, Box 48, Folder 4, John McCarthy Papers, Stanford University Archives, Stanford, California.

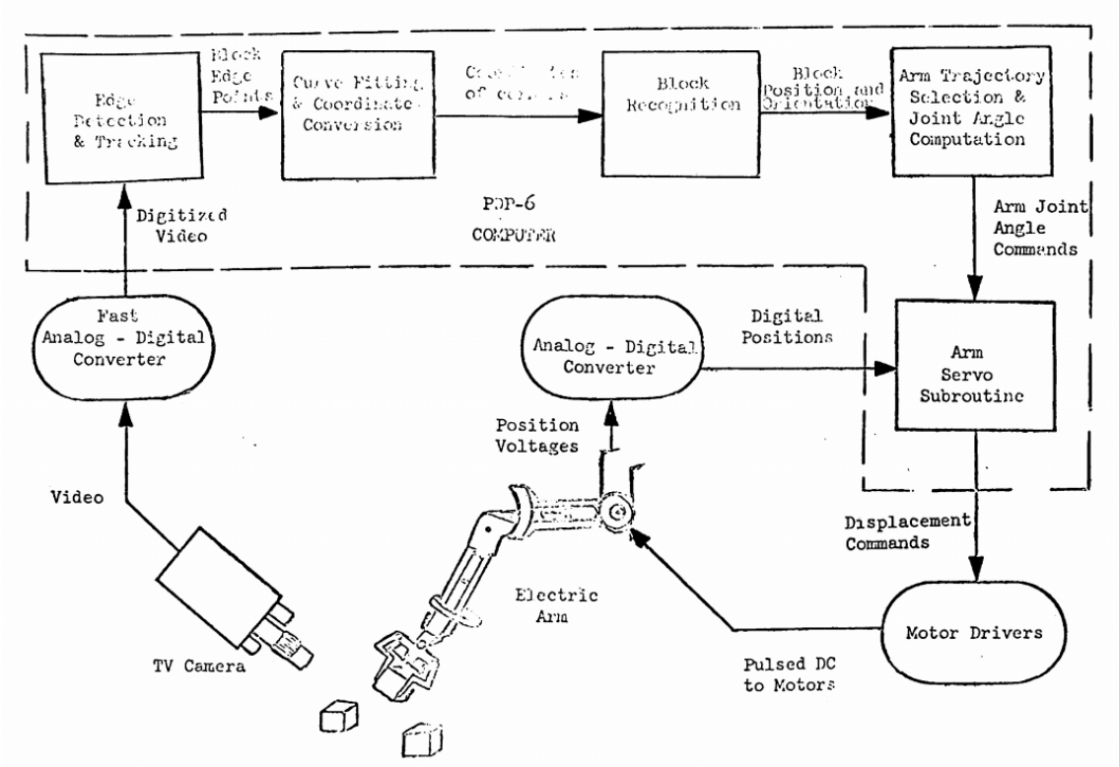

Figure 6. Diagram of the hand-eye equipment at SAIL, September 1968, Box 48, Folder 4, John McCarthy Papers, Stanford University Archives, Stanford, California.

Another project of importance to John McCarthy involved speech recognition. Similar to his work on hand-eye coordination, this research aimed to improve upon humans' physical capabilities. McCarthy described this project further in his abstract:

> In place of "eyes, ears, and hands" we could refer to "cameras, microphones, and manipulators", but find latter terms less suggestive of the functions that we wish to emulate. We leave the term "robot" and the ideas that go with it to the science fiction writers who have made them so entertaining.[61]

McCarthy's work on speech recognition and hand-eye coordination represented his view that computers could emulate human capabilities and functions. As indicated by this passage from his proposal, McCarthy humanized the work he was completing on computer functioning. According to McCarthy, computers held the potential to perform certain tasks better than humans. Contrary to other computer scientists at the time who denounced the idea that robots and computing machines could compete with humans, McCarthy worked to train AI systems in order to enhance their human-mimicking behaviors. Further, this particular sentiment represented McCarthy's vision that technological advancements could fix problems in human society, including the limitations of humans themselves.

[61] "Stanford Artificial Intelligence Project" (5-1), John McCarthy Papers.

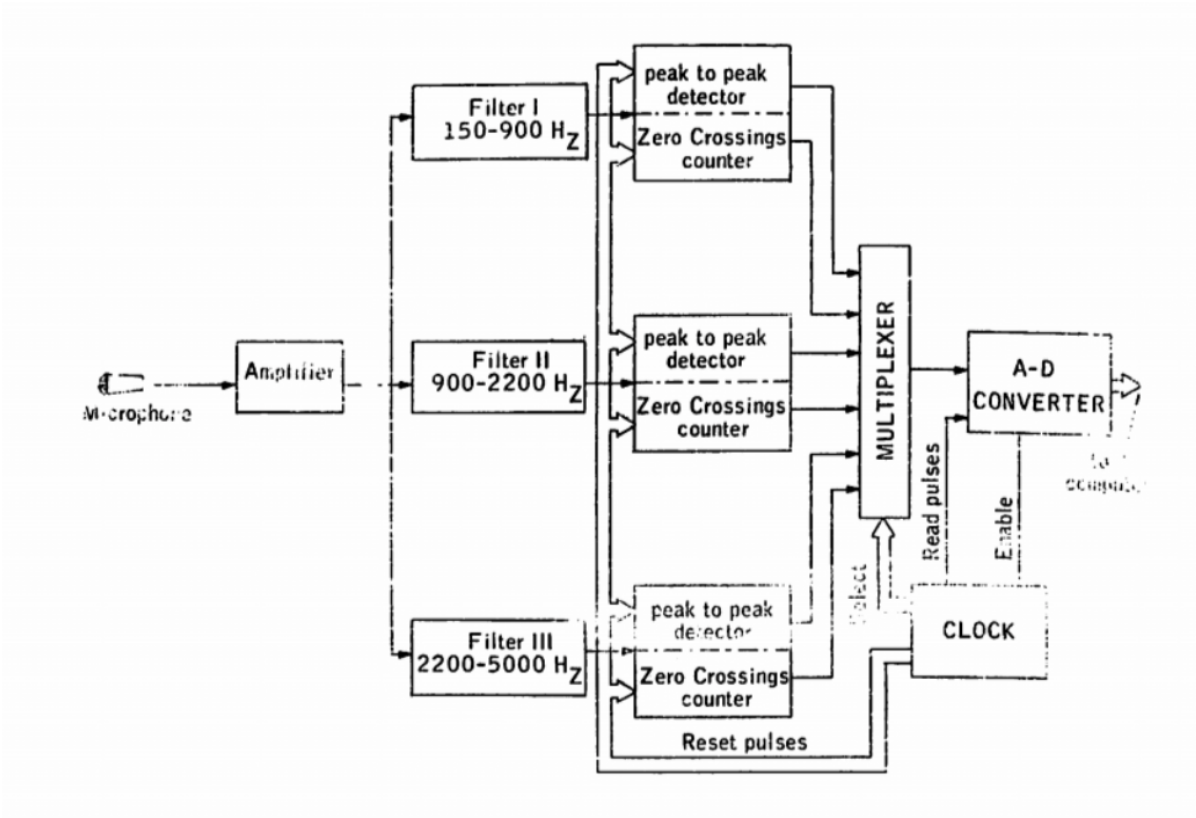

Figure 7. Diagram of the speech processing mechanism at SAIL, September 1968, Box 48, Folder 4, John McCarthy Papers, Stanford University Archives, Stanford, California.

During the Cold War, the United States' government was especially interested in competing against the Soviet Union in space exploration. The Stanford AI Lab tried to get on board as well:

> Glaser, McCarthy, and Minsky proposed that the first major attempt at the biological exploration of Mars should be made by a computer controlled automatic laboratory, containing a wide variety of visual input devices and mechanical manipulators which can under computer control perform many of the tasks of bio-chemical laboratory, requiring only a limited supervision by the experimenter on earth.[62]

Similar to McCarthy's research on hand-eye computer systems, the technological capabilities discussed in this proposal revealed McCarthy's vision for computers to be controlled from a long-range, remote location. This was of particular interest to ARPA and the U.S.

[62] "Stanford Artificial Intelligence Project" (5-1), John McCarthy Papers.

Department of Defense in that possessing the capabilities to remotely control computer systems on Mars from Earth would vastly outpace the Soviet Union's technological abilities. Further, ARPA's funding of such a project at the Stanford Artificial Intelligence Laboratory indicated that the United States' government was especially concerned with competing against the Soviet Union in regards to space exploration.

Conclusion

John McCarthy founded the Stanford Artificial Intelligence Laboratory in 1963 with ambitious visions of artificial intelligence and its uses in society. Yet, these visions at SAIL were shaped by Stanford's position as a "Cold War University," as well as by the general political environment on campus. In particular, Stanford's administration at the time pushed departments and their faculty to pursue contracts with the U.S. military, leading to an outsourcing of research funding for the university as a whole. This outsourcing represented Stanford's turn towards a business-related mission and overall aspirations for the university to compete with other research institutions on an economic scale. However, the Cold War University model also meant that the types of research projects that reached a level of prestige and impact were shaped by the Department of Defense's motivation to compete in the technological race against the Soviet Union. Additionally, the anti-war movement at Stanford involved a pushback from both faculty and students against military funding of university activities, including research. As the recipient of funding from ARPA and the Department of Defense, SAIL and John McCarthy became entangled in this anti-war debate and the Cold War University's climate.

McCarthy himself had always claimed that ARPA and the Department of Defense had little oversight on the projects at SAIL past the initial proposal approval process. McCarthy used this claim to argue against the idea that military funding impacted how and why he conducted his

AI research. The lack of oversight allowed McCarthy and other AI researchers at SAIL to curate their research projects according to their own interests and beliefs. McCarthy's own interests on artificial intelligence, however, reconciled well with those of his funders. Some of these projects at SAIL centered on the use of surveillance technologies to track civilians for the purpose of monitoring crime, the development of autonomous computer systems with hand-eye coordination and speech recognition, and even a remote-controlled mission to Mars. All of these projects held importance to ARPA and the Department of Defense in that they furthered the United States' interests in competing against the Soviet Union during the Cold War. ARPA and the Department of Defense, further, held influence over the types of AI projects that were funded, as well as those that were deemed important to the U.S. military. Moreover, this suggests that military funding played an integral role in the early visions of artificial intelligence at SAIL in that it allowed visionaries such as McCarthy to develop and pursue projects that adhered to their assumptions about U.S. society.

Epilogue

The Michigan State Police uses technology from a privately-owned biometrics company named DataWorks Plus under a $5.5 million contract.[63] DataWorks supplies the Michigan State Police with facial recognition services, including abilities to conduct image searches. In a 2019 study conducted by National Institute of Standards and Technology (NIST), an agency of the United States Department of Commerce, researchers found that the software used by DataWorks, facial recognition algorithms from NEC, Rank One Computing, and Cognitec, all exhibit bias.[64] Specifically, the study tested 189 facial recognition algorithms from 99 developers, including those used by DataWorks to misidentify Robert Julian-Borchak Williams.[65] The NIST also found that the algorithms falsely identified Black and East Asian Americans' faces 10 to 100 times more often than White Americans' faces.[66] How can facial recognition algorithms and AI designed to reduce crime (as justified by law enforcement agencies and the companies themselves) exhibit such biases?

For the original visionaries of such technologies, AI was intended for a specific group in American society. Both Wiener and McCarthy had people like themselves (White, middle- and upper-class men) in mind when envisioning how technology could be used within the United States. Wiener and McCarthy foregrounded the fields of cybernetics and artificial intelligence with their experiences as members of mainstream society. In particular, they believed in a "universal human nature" and technological fixes for society's ills. Yet, these assumptions about

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[63] Hill, "Wrongfully Accused by an Algorithm."

[64] Cade Metz and Natasha Singer, "Many Facial-Recognition Systems Are Biased, Says U.S. Study," *New York Times*, Dec. 19, 2019.

[65] Metz, et al.

[66] Metz, et al.

society neglected the racialized experiences of Black and Brown people in the United States and the country's history of biased institutions. The AI that misidentified Borchak-Williams is a holdover from this era: a deeply flawed system, intentionally or unintentionally designed to protect a set group of people.

The Department of Defense funded McCarthy and the Stanford AI Laboratory's AI research, leading to the establishment of the institution as one of the first AI laboratories in the world. Without their patronage, McCarthy's research at SAIL would not have come to fruition. Although McCarthy claimed that ARPA and the Department of Defense had little oversight on the projects at SAIL, his research was deemed useful by the U.S. military in furthering their aims in the Cold War. In this way, McCarthy and SAIL contributed to the image of Stanford as a "Cold War University." The military patronage of McCarthy's research at SAIL and the wider context of the "military-industrial-academic complex" further demonstrates that the United States government sustained McCarthy's visions for AI, including those with biased assumptions about society. As long as artificial intelligence continues to perpetuate these long-standing cultural assumptions from its founders and if law enforcement and government bodies continue to use these programs, the Borchak-Williams case will not be the last instance of misrecognition due to racial bias.

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