

Technological Takeover:

A Look into the Use of Artificial Intelligence in Welfare Programs

I have an easy question for you. Which color—pink, red, blue, green, or yellow—is the most creative? Your answer to this deceptively simple question will determine your future. Choose wisely!

The year is 2016, and the grade is fifth. It is raining outside, and unfortunately, our teacher has just cancelled outdoor recess, sentencing our playtime activities to the indoors and completely ruining all chances of pelting our fellow classmates with dodgeballs. The next best option? BuzzFeed quizzes. My friends and I all hungrily open our computers in unison, racing to be the first one to find the best quiz, browsing through titles—"Which Disney Character Are You?" and "What Hogwarts House Are You In?"—until eventually, we find the perfect questionnaire. The month is February and the day is Tuesday, and this next five-question quiz is about to change my life.

The winner that day was the infamous "Are You Left-Brained or Right-Brained" binary quiz. I had no idea what this meant, but I quickly learned that if you were right-brained, you were apparently creative and bubbly—your aesthetic was full of colors and flowers and pretty much resembled the pot of gold at the end of a rainbow. But left-brained? No, left-brained was way different. Left-brainers were deemed "the nerds"—black and white images of scribbled whiteboards or binders upon binders of chemistry formulas. As a ten-year-old, I obviously wished for the former. I mean, why would I want to subject myself to a life spent sequestered behind a desk? As I nervously took the quiz, picking "blue" as the most creative color and rating myself as "very organized," I received the one result I was dreading: left brain. Soon, my friends' results started popping up around me—the word "right" decorated with displays of color and

rainbows, slowly deafening my melancholy chemistry binders. I was left in a friend group full of nerds, and my mindset officially shifted.

From that point on, I became “the STEM girl.” I embraced this new identity—so much so that for a shamefully long time my Instagram bio read, “⚠️ Nerd Alert.” I took this test result and adopted it into a personal mindset, like a dog learning to respond to a new name after adoption. I carried the mentality from fifth grade to tenth, and soon my life was centered around technology. I enrolled in an Artificial Intelligence (AI) class, built Python desktop apps in my Advanced Topics class, designed my own AI model, and proposed a discovery paper on how AI might, or might not, be corrupting our society. Technology had transformed my life—but its reach did not stop there.

From the beginning, innovation has shaped human history. Consider the introduction of the wheel, the influence of the printing press, and most recently, the proliferation of the computer. In recent decades, computers have taken over tasks both small and large—everything from our morning wake-up call to the orbit of satellites in the atmosphere. World governments, too, have taken note of this increase in tech and have begun to use technological devices to their advantage. In particular, lawmaking bodies around the world have implemented artificial intelligence in various systems and programs, such as China’s use of AI for civilian surveillance purposes (Feldstein). To fully recognize the impact of artificial intelligence on society, it is important to first understand its backbone: algorithms. Algorithms harness massive quantities of data to process and evaluate different tasks. They take in a series of inputs and produce an output based on defined rules, similar to following a mathematical formula: x times one will always equal x , regardless of the input. While many have raved that this automation is the next phase in governmental efficiency, lawmaking bodies have also received backlash for implementing AI

due to concerns over moral and ethical implications. This debate over the use of AI hinges upon the question of whether a digital, non-human brain can make choices that require fundamentally human emotions, such as compassion and empathy, which algorithms lack.

One aspect of the ongoing AI debate is the influence of these technologies on welfare programs that provide various benefits to those in need. The scope and success of these programs vary around the world, with France and Finland leading the pack while the United States sits comfortably in the middle (Buchholz). Artificial intelligence is becoming increasingly present in these government programs, as described by political scientist and author Virginia Eubanks in her book *Automating Inequality: How High-Tech Tools Profile, Police, and Punish the Poor*. In the introduction, Eubanks states, “Today we have ceded much of [human] decision-making power to sophisticated machines” (Eubanks 3). Contemporary governments, she describes, are using artificial intelligence as a supplement for human workers, automating seemingly simple decisions along the way. Some examples include “automated eligibility systems, ranking algorithms, and predictive risk models [that] control which neighborhoods get policed” (Eubanks 3). By implementing algorithms into a variety of government programs, the efficiency of these programs has skyrocketed – but at what price?

As governments continue to implement artificial intelligence systems in welfare programs across the world, both supporters and opposers alike are forming opinions regarding their societal implications. One side is known as “anti-algorithm” and consists of critics of artificial intelligence’s use in society. Representatives of this position focus on the faults of algorithms, highlighting how they discriminate against certain demographics and cause inequality in welfare programs. In contrast, proponents of the use of AI in government operations focus wholeheartedly on the benefits that algorithms can produce, such as reducing federal

spending by automating menial government tasks or improving pre-established government functions, such as policing. However, while some advocate for the benefits of AI and others claim that it poses a dangerous threat, many find themselves situated somewhere in between. While the hybrid argument acknowledges the existence of the issues presented by anti-algorithm arguments, they also believe that human compassion combined with logistical algorithms can enable co-working between technology agents and human agents (Dhasarathy). For the purposes of this paper, we will focus on the anti-algorithm and pro-algorithm sides of this debate, as they provide the most detailed arguments for each position and the clearest distinction between various perspectives of the issue. We will examine how proponents for or against algorithms craft their arguments so that we can understand the foundational values behind each perspective to determine the best plan for the future of algorithms in welfare benefit programs.

Advocates against the application of artificial intelligence use appeals to pathos to insinuate that algorithms are the main perpetrators of discrimination against vulnerable groups. In “Digital Dystopia: How Algorithms Punish the Poor,” Ed Pilkington uses pathos to play into ideals of emotion over reason, stating, “But if you are one of the millions of vulnerable people at the receiving end of the radical reshaping of welfare benefits, you know it is real and that its consequences can be serious – even deadly” (Pilkington). Pilkington uses the second-person tense and a repetition of the word “you” to speak directly to his audience, making the situation more intimate and personal. His description of the reality faced by these vulnerable individuals elicits emotions of pity and sentiment. As his sentence structure changes with the use of the em dash— “serious – even deadly,”—so does his tone. Pilkington’s tone shifts from sympathy for vulnerable populations to anger for the algorithms that he attributes to be causing these negative consequences. Furthermore, Pilkington uses alliteration through the repetition of the letter “r,” as

he states that “the *receiving end of the radical reshaping of welfare benefits... is real*” (Pilkington emphasis added). The first three occurrences of the letter “r” are arranged in a contiguous fashion and leave little pause in between. This rapid succession of such harsh consonants conveys an almost vicious tone, as the “r” sound requires a near gritting of the teeth to produce. Thus, when the fourth “r” appears in the word “real,” the intense nature of the letter is again repeated. This repetition places an emphasis on the word “real” and establishes an intense, unmistakable tone. In doing so, Pilkington crafts a deeply emotional message and lets the progression of the letter “r” resemble the buildup of anger for the algorithms he is discussing.

While the anti-algorithm debate uses emotions to craft an argument of disdain for algorithms, advocates for the use of AI rely on appeals to logos highlight the validity of their argument. In “How AI Can Increase the Reach of India’s Public Welfare Programmes and Make Them Efficient,” Sanjeev Sharma details the formidable reality that a country as populous as India faces before sharing his proposed solution:

Making sure government services reach all 1.3 billion citizens, including those residing in remote regions, is a daunting task. AI-powered systems can become leapfrog technologies for our nation, transforming the reach and effectiveness of public welfare programs. (Sharma)

Sharma uses the indefinite pronoun “all” to enhance the reach of the subsequent statistic and to craft an imposing tone. Additionally, his use of parenthesis, “including those residing in remote regions,” further explains the scope of “all” and provides context for the task at hand. By including both of these elements, Sharma conveys a formidable tone, which culminates at the end of the periodic sentence: “...is a daunting task.” By putting the main idea at the end of this structured sentence, Sharma builds up his tone before driving it home, giving his message an

extra element of dramatic flair. Sharma uses this first sentence to reinforce the difficulty of the task at hand as though it has a mere chance of success. In contrast to the previous periodic sentence, Sharma then uses a loose sentence structure to create an immediate shift. By beginning with the modal verb “can become,” he creates a sense of relief by presenting a solution to the problem he just outlined, like an advertisement presenting the perfect new dishwasher you did not know you needed. By juxtaposing the starting periodic sentence with this loose sentence, Sharma shifts from an imposing tone to a hopeful one by presenting a statistically verified issue followed by a promising solution. He relies on appeals to logos to satisfy the natural flow from issue to solution, hence painting artificial intelligence as the ultimate savior. As such, although opponents of algorithm implementation commonly rely on emotional, heart-wrenching messages through appeals to pathos, proponents model their argument on a logical flow that appeals to logos.

In addition to the use of logical appeals in support of their arguments, advocates for algorithms also use rhetorical questions to illuminate the benefits of AI. In “AI for Social Protection: Mind the People,” Michael Lokshin and Nithin Umapathi discuss the use of AI and its positive effects on society before declaring, “Interest in artificial intelligence (AI) as an instrument for improving efficiency in the public sector is at an all-time high” (Lokshin and Umapathi). By describing AI as a peaceful “instrument” rather than a rigid tool or neutral method, artificial intelligence is associated with a positive connotation in support of the optimistic perspective on the technological tool. With this relationship established, Lokshin and Umapathi then present a follow-up question: “Given these benefits and the fact that AI technology is readily available and relatively inexpensive, why has AI not been widely used in social protection?” (Lokshin and Umapathi). By painting a reality without artificial intelligence as a

nonsensical one, this open-ended question conveys a tone of mild confusion at why this solution has not been considered. The importance of this rhetorical question is supported by the foundations of AI established in the previous sentence: that AI is peaceful and necessary. After all, why would you ever scrutinize something as harmless and peaceful as a beautiful harp melody?

Similar to Lokshin and Umpathi's depiction of the peaceful nature of AI, critic Ed Pilkington also uses rhetorical questions, but instead to highlight the negative effects of AI. When discussing the state of welfare programs in the UK, Pilkington targets algorithms to be the perpetrators of continued discrimination:

In the new world, inequality and discrimination can be entrenched. What happens if you are one of the five million adults in the UK without regular access to the internet and with little or no computer literacy? What if the algorithm merely bakes in existing distortions of race and class, making the gulf between rich and poor, white and black, college-educated and manual worker, even more pronounced? (Pilkington).

In referencing “the new world,” Pilkington highlights a comparison between explorers landing upon distant shores and artificial intelligence creating a brand-new virtual world while drawing upon the connotation of the promise of opportunity and the subsequent fear that a new world can bring. By following this statement with the rhetorical question—“What happens if you are one of the five million adults in the UK without regular access to the internet and with little or no computer literacy?”—Pilkington heightens the sense of fear that the introduction of technology into society has garnered. In continuation with his troubled tone, Pilkington uses enumeratio with the paired listings of distinct groups—“rich and poor, white and black, college-educated and manual worker”—and by doing so, highlights the entrenched disparities between these groups

which, according to Pilkington, artificial intelligence intensifies. By asking the rhetorical question “even more pronounced?” in such a way that frames these distortions as reality, Pilkington uses a threatening tone to convey algorithms as the enemy that will further deepen disparities between race and class. Thus, critics of artificial intelligence use rhetorical questions to present a haunting reality through a fearful tone, subsequently qualifying AI as something to be feared, not revered.

As both sides attempt to portray the validity and sanctity of their position, each relies on specific structural devices to enhance their argument. Proponents of algorithms form their arguments using a structure like a hypophora, as found in Sanjeev Sharma’s statement on India’s public welfare programs:

According to recent media reports, every year some 36 million families, or 14 percent of households, face an unexpected medical bill equal to the entire annual living expenses of one member of the family... Technology might have the answer to this complex problem.
(Sharma)

Through his examples and statistics, Sharma has crafted a straightforward and succinct tone. Although Sharma never explicitly asks a question regarding the possible solution to India’s medical bill problem, the organization of the solution immediately following the statistic insinuates as much. This variation on hypophora conveys a savior-like tone, like a villain coming in to save the day after he started the accident. This tone associates technology with liberation and therefore portrays artificial intelligence as the most practical solution.

While pro-algorithm advocates use hypophora, anti-algorithm arguers rely on periodic sentence structure and prepositional phrases to influence their arguments. Pilkington uses periodic sentence structure early in the opening line of his article: “All around the world, from

small-town Illinois in the US to Rochdale in England, from Perth, Australia, to Dumka in northern India, a revolution is underway in how governments treat the poor” (Pilkington). Before Pilkington reaches the meat of his argument, he uses a series of prepositional phrases in the examples “from small-town” to “northern India” to lengthen the opening of the sentence. Although these small details are grammatically unnecessary, they aid Pilkington in establishing a sense of credibility through appeals to ethos. Pilkington crafts an informed and knowledgeable tone by extending to all corners of the world rather than just claiming evidence from a solitary location. Additionally, by including the periodic sentence—“a revolution is underway in how governments treat the poor”—Pilkington establishes an accusatory tone throughout the duration of the parentheses. He treats the beginning of the sentence as evidence for his accusation before announcing his main message. This periodic sentence structure allows Pilkington to illuminate how the government is inadequately caring for impoverished populations.

Critics of algorithms also use asterismos to assist in portraying their anti-algorithm argument. Journalist Seb Starcevic uses this device when reporting on the situation faced by an Australian citizen dealing with a welfare program crisis, writing, “First – a slew of harassing phone calls from debt collectors. Then his tax rebate was withheld to pay arrears of about A\$2,000 (\$1,400) that government said he owed” (Starcevic). The hyphen at the beginning of the sentence serves as an asterismos by creating a pause in the flow of the sentence before introducing the subsequent information. By using this powerful device, Starcevic establishes a ceremonial tone, like a speaker giving an introduction before diving into his main message. This enhances the importance of the subsequent sentences, therefore increasing the strength of Starcevic’s argument. Proper and judicious use of these various devices of speech—periodic

sentence, asterismos, parenthesis—help the authors to structure and reinforce their messages both for and against the use of AI.

Historians trace the integration of innovative ideas back to the geocentric times of the sixteenth century when the Earth was perceived as the center of the universe. In 1514, astronomer Nicolaus Copernicus proposed his infamous heliocentric theory—that the sun is the center of the universe—and consequently countered the widely accepted geocentric theory. His revelation proved quite controversial and ignited debates over the structure of the solar system, making it one of the first examples of opposition to innovation (Leveillee). Three hundred years later, the debate over innovation persisted in the times of the Industrial Revolution. Public opinion regarding this period of technological advances alternated between appreciation for these life-changing innovations and disdain for the cruel conditions they produced. This caused a divide in the way society viewed technology: either as an essential element of innovation or as a catalyst of inequality and discrimination. Throughout history, innovations and technology have been viewed as contentious topics that teeter dangerously between beneficial and detrimental. Not surprisingly, then, the introduction of artificial intelligence into modern society is no different.

Supporters of the artificial intelligence movement have had their place in society for nearly one hundred years. These individuals tend to focus on AI's positive effects on the world, including its role in medical advances. Over time, people have used computer intelligence in medicine for tasks such as skin cancer detection. One such example is a machine-learning algorithm designed by medical professionals in 2018 that produced results comparable to those of highly trained dermatologists (Basu et al.). These life-changing medical advancements support the argument that artificial intelligence has a critical role to play in society by establishing a

foundation for the need for such technology in fighting cancer. While proponents focus on artificial intelligence's success in medicine, they also highlight how AI can advance human thought processes. In 2014, computer scientists from Google's DeepMind created AlphaGo, a computer program designed to play one of the oldest board games in the world, Go. After analyzing AlphaGo's movements, the best Go player in the world, Ke Jie, stated, "After humanity spent thousands of years improving our tactics, computers tell us that humans are completely wrong... I would go as far as to say not a single human has touched the edge of the truth of Go" (Scharf). In this way, artificial intelligence has opened up new avenues of exploration for humanity while simultaneously justifying the enthusiasm expressed by tech supporters. However, this fervor can often cause supporters to overlook the negative consequences that such a drastic adoption of inanimate technologies can bring. To illustrate this dilemma, picture an individual in a supposedly healthy relationship, completely under the influence of love and passion. In actuality, however, this passion is only shielding them from the red flags that persist within the depths of their relationship: lying, cheating, and disrespect. The individual is so hyper-focused on the positives that the negatives seem insignificant—that is, until they become inevitable.

While supporters are busy falling head over heels for technology, critics are doing quite the opposite. They often attribute their distrust of artificial intelligence to popular media, for example, the early Sci-Fi film *Metropolis*. This 1927 film featured a smart robot that was responsible for the mass destruction of a small town (Reynoso). While highly entertaining, *Metropolis* set an anti-tech precedent by establishing the fear of computers overtaking humans in society. The fervor was hard to shake then and remains present in society now. Additionally, critics of AI look deeper into the effects of technology in the labor sector, namely the potential

loss of jobs caused by AI implementation. This fear of job loss stems from the times of the Industrial Revolution when machines were replacing human workers left and right. There were many critics of this change at the time, including an organization of textile workers known as the Luddites. The Luddites protested the automation of the textile industry due to the inevitable job loss that would follow (McClelland). In this way, the Luddites and anti-algorithm supporters parallel in their fear of innovation's impact on the labor sector—and what it could mean for human workers. However, critics often overlook the possibilities of technology in industry, such as jobs where both humans and technology coexist. Technology does not have to be the evil that is corrupting society but instead it can be a wonderful addition that will foster growth and innovation. Even so, although debates may be heated amongst opposing sides of the issue, both are motivated by their inherent desire to help society and protect the sanctity of welfare programs.

Truth be told, I am not even eighteen years old. The state of welfare programs, or artificial intelligence's influence on them, has no direct impact on me... *yet*. The way innovation impacts society will not only be present today and tomorrow but for many years to come. For this reason, it is incredibly important that we ask ourselves: To what extent will we allow this technology to influence our lives and sociological structures?

Prior to writing this paper, I had no reason to have even the tiniest whisper of anti-AI sentiment. Technology has a massive influence on my day-to-day routine, how I interact with the world, and even my future: I am planning on majoring in computer science. So, why would I even open a Word document to write a paper illuminating the potential dangers of artificial intelligence? As I wrote this paper, I concluded that everything, no matter how shiny or appealing, has a dark side. As a society, we often take pleasure in focusing on the positive, while

remaining comfortably ignorant of potentially negative implications of our actions. However, it is only by analyzing both sides equally that we can truly grasp the extent to which something helps, or hurts, the world we live in.

Researching how artificial intelligence is hurting society was painful for me. It was ugly and full of truths that I did not want to consider. But the more I read, the more I realized. While artificial intelligence contributes to countless positives, we have shamefully allowed it to progress into unregulated negatives. For this reason, I consider myself an advocate of the anti-algorithm argument in certain applications, although not with the intensity expressed by some of the critics I studied. Nonetheless, it is my firm belief that we have allowed artificial intelligence to go too far in government programs. The use of AI in welfare programs is granting unsupervised algorithms the power to determine the future of innocent lives. When innately human traits like compassion, empathy, and equity considerations are removed from decision-making, inhumane and inequitable decisions are inevitable. Governments cannot claim a victory in the welfare sphere when the very people who need help the most are actually being harmed the most.

As much as it pains my STEM-nerd self to say, technology does not always make things better. Until we restore balance in the world of welfare, the gaps of society will only increase. In order to do so, efficiency must be steadied by compassion. Speed must be tempered by inclusion. Data must be analyzed alongside human thought. There is no doubt that artificial intelligence will play an important role in our future, but we must craft a society in which individuals are not discriminated against by the very machines designed to help them.

Works Cited

- Basu, Kanadpriya, et al. "Artificial Intelligence: How is It Changing Medical Sciences and Its Future?" *Indian Journal of Dermatology*, Sept. 2020.
- Buchholz, Katharina. "These Countries Spend the Most, and the Least, on Social Benefits." *World Economic Forum*, 10 Feb. 2021. Accessed 6 May 2023.
- Dhasarathy, Anusha, et al. "When Governments Turn to AI: Algorithms, Trade-Offs, and Trust." *McKinsey and Company*, 19 Oct. 2020. Accessed 14 Dec. 2022.
- Eubanks, Virginia. *Automating Inequality: How High-Tech Tools Profile, Police and Punish the Poor*. St. Martin's Press, 2018.
- Feldstein, Steven. "We Need to Get Smart About How Governments Use AI." *Carnegie Endowment for International Peace*, 22 Jan. 2019. Accessed 6 May 2023.
- Leveillee, Nicholas P. "Copernicus, Galileo, and the Church: Science in a Religious World." *Inquiries Journal*, 2011. Accessed 3 Apr. 2023.
- Lokshin, Michael, and Nithin Umapathi. "AI for Social Protection: Mind the People." *Brookings*, 23 Feb. 2022. Accessed 23 Jan. 2023.
- McClelland, Calum. "The Impact of Artificial Intelligence - Widespread Job Losses." *IT For All*, 30 Jan. 2023. Accessed 3 Apr. 2023.
- Pilkington, Ed. "Digital Dystopia: How Algorithms Punish the Poor." *The Guardian*, 14 Oct. 2019.
- Reynoso, Rebecca. "A Complete History of Artificial Intelligence." *G2*, 25 May 2021.
- Scharf, Caleb A. "Why I Love AI." *Scientific American*, 21 Feb. 2017. Accessed 3 Apr. 2023.

Sharma, Sanjeev. "How AI Can Increase the Reach of India's Public Welfare Programmes and Make Them Efficient." *The Economic Times* [New Delhi], 29 Nov. 2018. *ProQuest Education Journals*. Accessed 23 Feb. 2023.

Starcevic, Seb. "Australian Robodebt Scandal Shows the Risk of Rule by Algorithm." *Context*, 15 Dec. 2022. Accessed 23 Feb. 2023.