



SOCIAL EFFECTS OF ARTIFICIAL INTELLIGENCE

DR. SURENDRA SINGH

ASSISTANT PROFESSOR, SOCIOLOGY, SRI BALDEV RAM MIRDHA GOVT. COLLEGE, NAGPUR, RAJASTHAN

ABSTRACT:

Artificial intelligence (AI) can have a number of social effects, including: Bias and discrimination-AI systems can perpetuate or amplify societal biases due to biased training data or algorithmic design. For example, some AI systems have been shown to predict that groups that have been historically discriminated against are more likely to commit crimes. Job automation-AI-driven automation can lead to job losses, which can exacerbate income inequality and leave certain workers without viable employment opportunities. Loss of human connection-An overreliance on AI technology could result in the loss of human influence and a lack in human functioning in some parts of society. Data privacy and security-Individuals may unknowingly divulge personal information to AI systems, which could potentially be exploited or misused. Lack of transparency-AI can be faulty in many ways, and transparency is extremely important. Environmental impact-AI can be used for the protection of the environment and pollution control. For example, AI systems can help to detect energy emission reductions, remove CO₂, and monitor extreme weather conditions. Addressing the ethical and societal concerns raised by AI will require a collaborative effort involving policymakers, technologists, ethicists, and society at large.

KEYWORDS:

ARTIFICIAL INTELLIGENCE, EMPLOYMENT, SOCIAL EFFECTS, ENVIRONMENT, SECURITY.

INTRODUCTION

In recent years, advancements in artificial intelligence (AI) have shown enormous potential to transform technologies, practices and interactions on a global scale. The adoption of AI for content creation, data analysis, decision-making and other labor-intensive jobs is growing at a rapid rate, prompting many to question its social impacts. In the AI-skeptical piece titled "On the dangers of stochastic parrots: Can language models be too big?" Bender et al. make the point "that most language technology is built to serve the needs of those who already have the most privileges in society." At this point, researchers posit that AI-enabled tools such as ChatGPT are designed to serve experts, not novices, which begs the question of the social impact of AI in education.

According to MacArthur, general purpose AI tools have been designed for experts and well-educated workers to build more expertise and to increase efficiency. They are not designed for novices or education where training students to develop expertise by challenging and guiding them is the core focus. A Temple University study shows that "the usage of generative AI tools, such as ChatGPT or GitHub Copilot, poses a unique problem, as they were not developed solely for an educational purpose and their inclusion in the classroom may have unknown effects. Many researchers have begun to explore the potential negative effects the inclusion of these models into education may bring, including bias and fairness of these models, over-reliance, explainability, and trust." [1,2,3]

MacArthur adds that AI tools for tutoring show more promise, but they must be designed and tested by

educators, and protect student privacy. Also, "universities should not be charged high fees for such tools, since generative AI could not be developed in the first place without the training data of fluent prose written by college graduates, which it needs more of to keep developing," she says.

MacArthur believes that the future of writing and programming is critical editing -- a skill requiring humans to be able to assess and tweak the output of AI for their purposes. An AI ghostwriter cannot quite understand the purpose, audiences, guidelines for the genre and the real-world local context, because it's not embedded in the physical, social world. There's also the risk of the fluency fallacy -- the erroneous attribution of accuracy, expertise and authority to a given text or speaker based on the use of stylishly polished, grammatically correct, idiomatic syntax and vocabulary.

Teaching the foundational skills so that students can prompt AI well and evaluate the output intelligently for their purposes has now become more important than ever. "Experts are good at this prompt writing, not novices," says MacArthur, and strongly advocates for AI literacy to develop a set of skills that will enable individuals to communicate and collaborate effectively with AI, understand its ethical implications and critically reflect on its use for increased productivity. Recent research demonstrates that AI feedback on student writing in K-12 context is comparable to human feedback when certain criteria are used. According to MacArthur, however, heavy reliance on AI feedback could result in inaccurate

assessment of the student's need because then teachers might lose the opportunity to get to know their students well, understand their thought processes, give customized feedback and build the human relationships necessary for teachers to improve, which is also important to train future teachers.

Compared to higher education, the situation may be slightly different in K-12 public schools with large classes where "AI feedback could possibly relieve teachers of the burden of laborious feedback, but if it's used to replace teachers completely then that would be very problematic," MacArthur says.[4,5,6]

According to Hilbert, data from randomized control studies show that AI can increase the productivity in coding-related tasks by 55%, even for the senior professionals. In addition, AI copilots have become very important in scaling up, for example, teaching 1000s of students, or for online classes like Coursera with 70,000 students. Research shows that a student with a human personal tutor can increase their performance by two standard deviations, which means a grade improvement from C minus to A minus. Fine-tuning ChatGPT to evolve as a personal-like tutor is one way to address the challenges of providing meaningful student feedback in large classroom settings.

MacArthur argued that, although AI feedback may democratize access to tutoring, it could also democratize access to cheating -- robbing one's ability to learn something -- and teaching the difference between the two is crucial.

DISCUSSION

According to Hilbert, there are various sources such as age, gender, ethnic background, religious belief and income that could lead to bias in an AI system. However, he says that "it's much easier, feasible and practical to take this bias out of a machine than out of the brain." This is because a biological neural network like the human brain can hold only a small number of variables by design, and so there is a need to summarize the variables, which often leads to an ingrained bias. In contrast, for an AI system, all that is required to remove the bias from the results is to build the models in such a way that they do not consider those bias variables in their computation, or at least make their outcomes equally probable with respect to those.[7,8,9]

Hilbert is optimistic about such a strategy as it requires modifying the software only, but he cautions that first an agreement is needed on these potential bias variables that should be left out from the models. The obvious ones are the handful of variables protected by law, such as gender and race. Going beyond these, he thinks that reaching such an agreement might be challenging because every variable contributes to an AI system's accuracy, and leaving out some could lead to sacrificing the accuracy, which in turn could result in taking a hit on the company's profit. And without any government regulations, companies might not be ready to do that.

MacArthur agrees that removing the bias from an AI

system is technically easier, but she also points out that unless regulations mandate it, that is difficult to achieve, especially in the US. She noted that, at the ground level the engineers developing the AI are more engaged in releasing the software as quickly as possible with the highest accuracy and trying to maximize the company's profits, thus, leaving little room for inspection of the bias and the resulting discrimination.

Both experts underscore the importance of diversified training data to eliminate such risks of bias and underrepresentation.

Novelty and hallucinations in AI

Recent studies show that AI can improve human-decision making by increasing the novelty in its solutions. Hilbert highlights the ingenious role that AI can play by citing how AlphaGo -- the AI system developed by Google DeepMind -- won against the best human player in the world in the game of Go with its famous move 37, initially questioned by human experts, but later on lauded for its innovation. He also thinks that AI-generated data, including adversarial data, can be effectively used to train other AI systems, advancing innovations and predictive analysis, especially in healthcare. He cites the example of how Google developed a pair of interactive patient-doctor AI models that trained on each other's data, producing an AI system that showed not only improved diagnostic accuracy, but also performed as good as a primary care physician, even superseding on empathy, making it hard to distinguish from a human caregiver. MacArthur also believes that AI will be extremely helpful in healthcare, but she emphasizes the importance of human expertise in order to keep using AI intelligently.[10,11,12]

On the topic of hallucination -- incorrect or misleading response generated by AI models -- Hilbert argues that it's more of a feature than a bug in an AI system, because the system is designed to generate the most probable outcome most of the time, but when there is incomplete information, it can hallucinate and output a less probable one, much like our dreams where we sometimes hallucinate in our sleep. MacArthur, however, points out that depending on the context, the results of a hallucination can be good or bad and, especially in healthcare, hallucination should not be desired as it could lead to unexpected results.

Hilbert also stresses on the importance of human agency in giving goals to the AI. The technical term in machine learning is a reward function or inverse loss function. "Machine learning based AI cannot give itself goals; humans do. Even for so-called 'unsupervised' learning," says Hilbert. "Those humans are the ones ultimately responsible for the AI's behavior."

He notes that defining adequate goals is tricky. For example, the first version of the YouTube recommender algorithm was called the "watch-time maximization algorithm," but instead it also could have been the "watch-time maximization without making children addicted algorithm;" but it wasn't. "For one, humans do not

agree on what we want AI to do. Additionally, the complex adaptive systems managed by AI are rattled with innumerable known- and unknown-unknowns,” comments Hilbert. “Finding the right goals is known as the AI alignment problem, and it will likely keep humankind busy for the decades to come.”[13,14,15]

Artificial intelligence will definitely cause our workforce to evolve. The alarmist headlines emphasize the loss of jobs to machines, but the real challenge is for humans to find their passion with new responsibilities that require their uniquely human abilities. According to PwC, 7 million existing jobs will be replaced by AI in the UK from 2017-2037, but 7.2 million jobs could be created. This uncertainty and the changes to how some will make a living could be challenging.

The transformative impact of artificial intelligence on our society will have far-reaching economic, legal, political and regulatory implications that we need to be discussing and preparing for. Determining who is at fault if an autonomous vehicle hurts a pedestrian or how to manage a global autonomous arms race are just a couple of examples of the challenges to be faced.

Will machines become super-intelligent and will humans eventually lose control? While there is debate around how likely this scenario will be we do know that there are always unforeseen consequences when new technology is introduced. Those unintended outcomes of artificial intelligence will likely challenge us all.

Another issue is ensuring that AI doesn't become so proficient at doing the job it was designed to do that it crosses over ethical or legal boundaries. While the original intent and goal of the AI is to benefit humanity, if it chooses to go about achieving the desired goal in a destructive (yet efficient way) it would negatively impact society. The AI algorithms must be built to align with the overarching goals of humans.

Artificial intelligence algorithms are powered by data. As more and more data is collected about every single minute of every person's day, our privacy gets compromised. If businesses and governments decide to make decisions based on the intelligence they gather about you like China is doing with its social credit system, it could devolve into social oppression.[16,17,18]

RESULTS

POSITIVE IMPACTS OF ARTIFICIAL INTELLIGENCE ON SOCIETY

Artificial intelligence can dramatically improve the efficiencies of our workplaces and can augment the work humans can do. When AI takes over repetitive or dangerous tasks, it frees up the human workforce to do work they are better equipped for—tasks that involve creativity and empathy among others. If people are doing work that is more engaging for them, it could increase happiness and job satisfaction.

With better monitoring and diagnostic capabilities, artificial intelligence can dramatically influence healthcare.

By improving the operations of healthcare facilities and medical organizations, AI can reduce operating costs and save money. One estimate from McKinsey predicts big data could save medicine and pharma up to \$100B annually. The true impact will be in the care of patients. Potential for personalized treatment plans and drug protocols as well as giving providers better access to information across medical facilities to help inform patient care will be life-changing.

Our society will gain countless hours of productivity with just the introduction of autonomous transportation and AI influencing our traffic congestion issues not to mention the other ways it will improve on-the-job productivity. Freed up from stressful commutes, humans will be able to spend their time in a variety of other ways.

The way we uncover criminal activity and solve crimes will be enhanced with artificial intelligence. Facial recognition technology is becoming just as common as fingerprints. The use of AI in the justice system also presents many opportunities to figure out how to effectively use the technology without crossing an individual's privacy.

Unless you choose to live remotely and never plan to interact with the modern world, your life will be significantly impacted by artificial intelligence. While there will be many learning experiences and challenges to be faced as the technology rolls out into new applications, the expectation will be that artificial intelligence will generally have a more positive than negative impact on society.

Artificial intelligence (AI) is quickly changing the way we work and the way we live. The emergence of ChatGPT has thrust AI, especially Generative AI, into the spotlight. The societal impact of AI is on most people's minds. This article presents several research projects on how AI impacts work and society. Three research works are discussed in this article. The first study develops a theoretical framework structuring the legal and ethical objectives that are needed and the means to achieve them. The second study concentrates on bias and discrimination issues embedded in AI applications. It focuses on enhancing the collaboration between AI users and AI systems to alleviate bias and discrimination issues. The third study focuses on the governance of AI, and the study will design and develop an integrated AI governance framework to help guide the design and development of AI applications and facilitate the evolutions and revolutions of ethical AI systems.[17,18,19]

In summary, we can see these different functions of AI [5,6]:

Automation: What makes a system or process to function automatically

Machine learning and vision: The science of getting a computer to act through deep learning to predict and analyze, and to see through a camera, analog-to-digital conversion and digital signal processing

Natural language processing: The processing of human language by a computer program, such as spam detection

and converting instantly a language to another to help humans communicate

Robotics: A field of engineering focusing on the design and manufacturing of cyborgs, the so-called machine man. They are used to perform tasks for human's convenience or something too difficult or dangerous for human to perform and can operate without stopping such as in assembly lines

Self-driving car: Use a combination of computer vision, image recognition amid deep learning to build automated control in a vehicle.

CONCLUSION

AI is here to stay in our world and we must try to enforce the AI bioethics of beneficence, value upholding, lucidity and accountability. Since AI is without a soul as it is, its bioethics must be transcendental to bridge the shortcoming of AI's inability to empathize. AI is a reality of the world. We must take note of what Joseph Weizenbaum, a pioneer of AI, said that we must not let computers make important decisions for us because AI as a machine will never possess human qualities such as compassion and wisdom to morally discern and judge [10]. Bioethics is not a matter of calculation but a process of conscientization. Although AI designers can up-load all information, data, and programmed to AI to function as a human being, it is still a machine and a tool. AI will always remain as AI without having authentic human feelings and the capacity to commiserate. Therefore, AI technology must be progressed with extreme caution. As Von der Leyen said in White Paper on AI – A European approach to excellence and trust: "AI must serve people, and therefore, AI must always comply with people's rights.... High-risk AI. That potentially interferes with people's rights has to be tested and certified before it reaches our single market"[20]

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