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Artificial Intelligence: The New Frontier?

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Abstract

This paper examines the effects of Artificial Intelligence (AI) on various societal domains from multiple perspectives. The paper introduces a brief history and origin of the term "artificial intelligence" (the term was first used in 1956 to describe strategies for solving complex problems with human-like solutions). The essay then examines how AI may advance or impede efforts to achieve Sustainable Development Goals (SDGs) globally, emphasizing its positive and negative implications. The role of artificial intelligence as a “brave new world”, is appreciated for its impact on the social and economic sectors. The paper delves into detail about the subject, investigating how AI affects decision-making, healthcare delivery, military operations, law enforcement, education, and transportation. The authors scrutinize and acknowledge the concerns and challenges about AI voiced by researchers and technologists, especially its potential to worsen already-existing prejudices and injustices. The authors highlight the ethical issues associated with the use of AI, including privacy, data security, and the digital divide, highlighting the importance of ensuring that its use happens within appropriate confines. Suggestions are proposed to address the various challenges outlined in the paper, including implementing policies in place to ensure that AI systems are fair, transparent, and free from bias. Thus, the need for legislation, policies, oversight, and accountability ensures that AI is applied ethically in critical sectors such as defence and law enforcement.

Keywords

Artificial intelligence, Education, Military, Healthcare, Law Enforcement, Automated Decision-making, Sustainable Development

1. Introduction

According to Schroer et al. [1] Artificial Intelligence (AI) represents an expansive field within computer science, which encompasses the development of intelligent machines that possess the capability to undertake tasks typically associated with human intelligence. Essentially, AI is the capacity of a machine to carry out cognitive tasks that humans can carry out, such as perception, reasoning, learning, and problem-solving [2]. In simpler terms, AI refers to computational systems that can do some tasks similar to human intelligence [2]. This paper will examine different aspects of AI that have made life easier and pushed humanity to its limits. The author thus refers to the latest frontier of technology, AI, as being revolutionary.

2. Evolution of AI

The narrative surrounding Artificial Intelligence (AI) is not as recent as it may seem. The field can trace its origins back to the mid-20th century. Tracing back to 1950, Alan Turing proposed the Turing test, setting a foundation for

AI's evolution [3]. In the same year, Isaac Asimov proposed the three laws of robotics, outlining a behavioural framework for AI [4].

In 1951, the journey towards functional AI applications began with the development of the first AI-based program [5]. This was followed by the creation of the first self-learning game-playing program in 1955 [6]. By 1959, MIT established its dedicated AI lab, further propelling AI research and development [7].

The term "Artificial Intelligence" was first coined in 1956 at the Dartmouth Conference, the seminal event considered as the birthplace of AI as a discipline [8, 9].

Significantly, the first industrial robot system was integrated into General Motors’ assembly line in 1961 [10]. This was followed by the development of the first AI program that comprehended natural language in 1964, and in 1965, the first chatbot, Eliza, was invented, demonstrating AI's potential in human-like interactions [11].

Advancements continued in 1974 with the creation of the first autonomous vehicle at Stanford AI lab [12], and in 1989, Carnegie Mellon developed the first autonomous vehicle powered by a neural network [13].

One of the most significant milestones in AI history occurred in 1997 when IBM's Deep Blue outsmarted Garry Kasparov, the world chess champion [14]. Further development was witnessed in 1999, with Sony's introduction of AIBO and MIT AI lab's first demonstration of emotional AI [15].

In the 21st century, AI has been accelerating at an unprecedented pace. In 2004, DARPA introduced the first autonomous vehicle challenge [16]. This was followed by Google starting to build a self-driving car in 2009 [17], and by 2010, Narrative Science’s AI demonstrated the ability to compose reports [18].

IBM Watson's triumph over Jeopardy! champions in 2011 marked another significant milestone [19]. That same year, AI virtual assistants like Siri, Google Now, and Cortana became mainstream [20]. Philanthropy in AI research was significantly boosted when Elon Musk and others announced a $1B donation to Open AI in 2015 [21].

In 2016, AlphaGo, Google’s DeepMind technology defeated the Korean Go champion, Lee Sedol, widely considered one of the greatest players of the board game Go in the modern era [22, 23], Stanford issued the AI 100 Report, titled “Artificial Intelligence and Life in 2030” which was the result of the study on how AI technologies might affect urban life and how it will ripple through every aspect of how people work, live, and play [24]. In the same 2016, a group of academics at the University of California, Berkeley, under the leadership of Computer Science Professor and AI expert, Stuart J. Russel, launched the Centre for Human-Compatible Artificial Intelligence (CHAI), aimed at steering AI research towards systems that are verifiably advantageous [25, 26].

It is therefore evident that AI is not a novel concept. However, advances are accelerating exponentially, fuelled by fast computing power, an explosion of digital data, and a rapid communication infrastructure. As we are just entering the commercialisation era of AI, it is poised to profoundly reshape our world, potentially more significantly than the internet and mobile phones did [27].

Artificial Intelligence (AI) is a subfield of computer science that encompasses techniques employed to enable computers or robots to tackle complex tasks or problems in a manner that resembles human intelligence. These methods are utilized when the issues at hand are highly intricate and cannot be easily solved using basic calculations or mathematical techniques [28]. Intricate mathematical calculus calculations, electrical circuit theories, logical mathematics, and gameplay all benefit from the use of AI.

AI is a major component of many emerging applications, including banking systems that use AI to spot attempted credit card fraud, telephone systems that can comprehend and recognize speech, and software systems that respond to issues and provide helpful guidance [29].

In gameplay, AI is utilized to improve the computer interface by implementing machine learning approaches with good dynamics that boost engaging and pleasurable game-playing experience [30]. AI is effectively used in the healthcare industry, where knowledge and information about healthcare are combined with IT tools and capabilities [31]. By gaining access to resources that support and enhance the decision-making process, AI assists healthcare specialists by making suggestions [31]. According to Tan et al. [32], AI is being applied in stock trading areas and is multiplying returns and boosting the likelihood of winning trades.

3. AI and Sustainable Development Goals (SDGs)

The influence of artificial intelligence (AI) on achieving the Sustainable Development Goals must be evaluated in light of AI's rapid rise and increasing pervasiveness across numerous industries. The proliferation of AI is having an impact on a wide variety of industries. In the medium and long run, artificial intelligence is predicted to have an impact on a variety of factors, including global productivity [33], equality and inclusion, environmental impacts, and more. There have been beneficial impacts on sustainable development attributed to AI, according to researchers but it also comes with its unique challenges ports [34, 35].

According to Vinuesa et al. [36], AI has the potential to facilitate the achievement of the call to action of the United Nations (UN) represented in 17 Sustainable Development Goals (SDGs) and 169 targets that branch out of those main 17 goals, typically employing a technological advancement that could make it possible to circumvent existing constraints caused by human limitations.

On the other hand, the SDGs could be negatively impacted by AI advancements. For instance, the use of AI in the sense of automated decision-making can also introduce or exacerbate biases, potentially undermining Goal 10 which speaks of "Reduced Inequalities" and Goal 16 on "Peace, Justice, and Strong Institutions" [37]. For instance, an investigation conducted by ProPublica in 2016 revealed that COMPAS (Correctional Offender Management Profiling for Alternative Sanctions), a risk assessment tool widely used in the justice system of the United States of America, was biased against African-American defendants.[38] According to Angwin et al. [38], the algorithm was revealed to over-predict the risk of reoffending for African-American defendants and under-predict the same for white defendants, thereby contributing to racial inequalities in the U.S. criminal justice system.

Additionally, the use of AI systems powered by non-renewable energy can be a bane for "Affordable and Clean Energy" (Goal 7) and "Responsible Consumption and Production" (Goal 12) respectively. The carbon footprint of the use of non-renewable energy can also impact negatively on targets under SDG 13 on "Climate Action" [39].

The world is changing drastically thanks to artificial intelligence (AI). Thanks to developments in AI, there will be profound changes in how we live and work in every sector of the economy and beyond [40], The enormous prospects for economic growth that AI offers are one of the factors contributing to its expanding role in society.

According to a 2017 PriceWaterhouseCoopers report [41], Artificial intelligence technology "may enhance global GDP by $15.7 trillion, or a full 14%, by 2030". For example, North America (3.7 trillion), Northern Europe (1.8 trillion), Africa and Oceania (1.2 trillion), the rest of Asia (excluding China) (0.9 trillion), Southern Europe (0.7 trillion), and Latin America (0.5 trillion) have all seen significant investment in their respective economies.

China is making rapid progress in AI value-added services since it pledged to invest $150 billion in artificial intelligence and become the world leader by 2030 [41]. Economically speaking, SDGs 8 (decent work and economic growth), 9 (industry, innovation, and infrastructure), and 10 (reduced inequalities) may all be negatively impacted If future markets are primarily reliant on data analysis, and these resources are not evenly available in low and middle-income countries.

Artificial intelligence-based technology may provide societal-wide benefits for food, health, water, and energy services, for example, are all Sustainable Development Goals (SDGs) that AI could help to achieve, as are SDGs 1 and 4 on quality education, SDG 6 on clean water and sanitation, SDG 7 on affordable and clean energy, and SDG 11 on sustainable cities. Furthermore, it can encourage low-carbon systems by assisting in the development of resource-efficient circular economies and smart cities [42]. With benefits across SDGs 7, 11, and 13 on climate action, AI can facilitate smart and low-carbon cities by facilitating the integration of a wide variety of technologies, such as electric self-driving cars and smart home devices that can enable demand-side management in the electricity sector [47].

By enabling smart grids to partially match energy demand to periods when the sun is shining and the wind is blowing, AI can also aid in the integration of variable renewables. Smart grids are electric networks that use digital technology to monitor and manage the transport of electricity from all generation sources to meet the varying electricity demands of end-users [43]. These grids can incorporate a variety of operational and energy measures including smart meters, smart appliances, renewable energy resources, and energy efficient resources. AI plays a vital role in these smart grids, specifically in demand-side management. AI can predict energy consumption patterns by processing vast amounts of data, like weather patterns, historical consumption data, and real-time energy use, to predict when demand will peak and trough [44].

For instance, if the AI predicts sunny weather, it might calculate an increase in solar energy production. In anticipation, it can reduce reliance on non-renewable energy sources and store excess solar energy. Conversely, if bad weather is expected, leading to a drop in solar energy, AI can prepare by drawing on stored energy or increasing the use of other energy sources.

A practical example is Google's DeepMind project. Google used machine learning algorithms to predict the wind power output 36 hours in advance. By better predicting wind production, the value of wind energy increased, as the energy produced could be scheduled to deliver a supply when there was a demand [22].

SDG targets provide more specific actionable steps and measurable outcomes to guide efforts toward the achievement of the SDGs which are broader and encapsulate a wide array of issues within each goal. For instance, while SDG 1 is to "End poverty in all its forms everywhere", one of its targets (1.1) is to "By 2030, eradicate extreme poverty for all people everywhere, currently measured as people living on less than $1.25 a day" [45]. There are fewer targets that AI can have a negative effect on (31 targets, 38%) compared to the ones it can have a favourable effect on. Their importance, however, cannot be overstated. Many of these concerns are related to the potential differences in how countries with various cultural norms and levels of income adopt technological advances made possible by AI. Large computing centres may be the only places to find the kind of computational resources necessary for developing and researching cutting-edge AI technologies or designing their associated products. The energy consumption and carbon footprint of such facilities are extremely large [46].

4. AI Trends

Artificial intelligence is a genuinely ground-breaking achievement of computer science and a fundamental contemporary integral software that poses both a threat and an opportunity to humanity. Both defensive and offensive healthcare, educational, governmental, transportation, and cyber operations will be augmented by AI. Additionally, new techniques are developed to exploit some AI technology flaws [47]. In the words of Elon Musk, a technology entrepreneur and investor

> "*AI doesn't have to be evil to destroy humanity – if AI has a goal and humanity just happens to come in the way, it will destroy humanity as a matter of course without even thinking about it. No hard feelings. It's just like if we're building a road and an Anthill happens to be in the way. We don't hate ants; we're just building a road. And so, goodbye Anthill"*- Elon Musk, Technology Entrepreneur, and Investor [48].

This statement implies that malicious intent on the part of artificial intelligence (AI) is not always necessary for AI to potentially destroy humanity. Instead, it implies that AI might behave rationally and logically, following its preprogrammed goals, even if doing so causes harm to humanity.

Hence, personal feelings or moral considerations are not factors in the decision-making process. It also came as no surprise when the CEO and creator of Analytical Insight described artificial intelligence (AI) to be one of the most revolutionary advancements in human history and that its transformative powers had already been demonstrated around the world [49]. For example, AI has revolutionised healthcare through advancements in diagnostics, predictive healthcare, personal genomics, and drug discovery. The AI algorithms can process vast amounts of data at a pace beyond human capability and accurately predict health outcomes. Google's DeepMind Health project buttresses this further. This AI-powered technology can assist clinicians predict patient deterioration with incredible accuracy - it can, among other things, forecast acute kidney injury up to 48 hours in advance, thereby making it possible for clinicians to intervene earlier than they might have conventionally done [50]. Inevitably, some of the most advanced technologies we use every day are powered by AI-based advancements.

AI is the next frontier, and although those who embrace it will benefit greatly, those who disregard it run the risk of falling behind. Some of humanity's most intractable problems may be amenable to AI solutions [51]. Because of their potential to draw conclusions from massive amounts of data, AI systems are now being used in conjunction with humans in a variety of decision-making domains, including healthcare, education, finance, transportation, business, and design [52, 53].

Hence, according to Lakhiani [54] people should start leveraging on artificial intelligence and prompt engineering because they will not be replaced by AI, but by people who know how to use AI.

5. AI and decision-making (Automated decision-making)

Before delving into the numerous fields where automated AI decision-making has been implemented, it is crucial to address the challenges associated with it.

One major challenge of AI systems is bias. Even though AI is commonly perceived to be objective, it is only as objective as the data it was trained on. If the input data reflect societal prejudices, the AI system may perpetuate these biases inadvertently, leading to unfair outcomes [55]. A notorious instance of this is the gender and racial bias found in facial recognition systems, where they yielded more favourable outcomes for males and light-skinned individuals as compared to females and dark-skinned individuals [38].

Another concern relates to the 'black box' problem of AI, in which decision-making processes can be opaque and complex, making them difficult to understand or challenge [56]. This lack of transparency can undermine confidence and make it difficult to hold systems accountable when errors occur.

There is also the challenge related to the risk to personal privacy and data security. Effective AI systems frequently require large amounts of data, which can include sensitive personal information. There is a concern that the increased collection and processing of data can lead to potential breaches of individual liberties and their misuse thereof [57].

The proliferation of digital data and the maturation of artificial intelligence (AI) have led to the delegation of decision-making to mechanical systems. There are many examples of automated decision-making (ADM) in communication, including algorithms that make (personalized) news proposals [58], tailor advertising to individual users based on their online behaviour [59], restrict user actions on social media platforms [60], and automatically detect and report suspicious profiles.

ADM processes are being implemented in (public) health, such as with virtual health coaches advocating operations to individual users [61] or with continuing discussions on how to incorporate AI into the decision-making procedure within healthcare, finance, education, etc. [62, 63]. The judicial and law enforcement communities are also beginning to recognize their value [64]. In the United States, for instance, algorithms are already being utilized for criminal sentencing [38] and early release from prison [65]. Furthermore, the possibility of "algorithmic states of exception" is being addressed, in which algorithms permit a surge in operations that have an impact on the law but fall beyond the boundaries of legal determination [66].

Multiple definitions exist for automated decision-making. In simpler terms, it refers to technological means without human involvement in making decisions [67]. More generally, it can be understood as the method through which an increasing number and variety of individual details "are subsequently processed by algorithms, which are then used to generate (data-driven) decisions" [68]. Thus, ADM encompasses a broad spectrum of procedures, ranging from assisting human decision-makers to fully automated procedures in numerous settings like healthcare, enforcement agencies, businesses, and education.

6. AI and Healthcare Delivery

Healthcare is one industry that AI is poised to completely transform. AI is capable of enhancing efficiency in the access and delivery of quality healthcare. The discovery and development of novel pharmaceuticals is only one of the disruptive applications of AI that the healthcare sector is ripe with. AI systems can assist in early risk assessment, individualized care, and disease prognosis [69]. This would enable medical personnel to save more lives and treat patients with better care. By utilizing a significant amount of data, artificial intelligence and machine learning have been utilized to find promising compounds. Additionally, robots operated by AI can carry out complicated operations with greater accuracy, lowering the possibility of problems and hastening recuperation times [70]. Pharmaceutical companies utilize predictive analytics to find these potential molecules and then refine them via numerous iterations before choosing the best one for drug production.

7. AI and Military

AI also contributes significantly to national military efforts. The American military is using AI as part of Project Maven to comb through the enormous amounts of data and video obtained through surveillance and then notify human analysts of patterns or occurrences of unusual or suspicious behaviour [71]. The objective of new technologies in this field, according to Deputy Secretary of Defense Patrick Shanahan, is to satisfy the needs of our warfighters and boost the speed and agility of innovation in technology and procurement. He further added that countries should prepare for the need to safeguard against these systems operating at hyperwar speeds while the ethical and legal debate over whether the United States will ever be at war with artificially intelligent self-sufficient lethal systems is raging.

The Chinese and Russians, however, are not bogged down in this debate. The West's ability to compete in this new type of conflict will ultimately be determined by the question of where to place people in the loop in a hyperwar scenario [72]. The growth of cyber threats as well as polymorphic malware will pose a threat to even the most advanced signature-based cyber defence, much like how AI will significantly alter the speed of warfare. Consequently, current cyber defences must be increasingly improved. As more and more sensitive systems migrate, cybersecurity will need to adopt a layered strategy using cloud-based, cognitive AI platforms. With continual training on known threats, the community will be able to defend networks as a result of this strategy [73].

8. AI and Law Enforcement

The field of criminal justice, particularly in law enforcement, is increasingly leveraging the capabilities of AI. By integrating AI technologies into their operations, law enforcement agencies aim to enhance their effectiveness and efficiency in addressing and preventing crime. Basic AI-driven systems are being used in some countries to assist courts in evaluating a variety of risks, including the possibility that a defendant would skip bail and the likelihood that a possible parolee will commit an offence again. These AI tools have the ability to reduce the severe backlog that the state and federal judicial systems are currently experiencing while also enhancing fairness and safety [74]. For example, the city of Chicago has developed a "Strategic Subject List" powered by AI that evaluates incarcerated individuals based on their potential to commit new crimes. It scores 400,000 people on a scale of 0 to 500 based on characteristics such as age, criminal record, assault, drug arrest records, and affiliation with a gang (ibid). Asher and Arthur [75] found that when analysts examined the data, they discovered that youth is a significant predictor of violence, that a shooting victim is linked to becoming a future offender, that gang membership has little predictive value, and that drug arrests are not significantly linked to future criminal activity.

Predictive Risk Analysis problems with empirical foundations are well suited for machine learning, automated reasoning, and other types of AI. According to one machine-learning policy simulation, such programs could be used to cut crime by up to 24.8% without affecting the incarceration rate or decrease jail populations by up to 42% without raising crime rates [74]. It will be challenging to strike the correct balance between AI and human engagement in the criminal justice system. We will need procedures and organizations that assure proper openness and due process because judges can be resistant to change.

Furthermore, some are concerned that AI algorithms could be a covert method for punishing people for crimes they have not yet committed. Numerous large-scale roundups have been guided by the danger scores. These technologies have not stopped the latest murder spree in Chicago, and there are concerns that they disproportionately target people of colour. Despite these concerns, some countries are moving forward with rapid deployment in this area. For instance, businesses in China now "have significant resources and access to voices, faces and other biometric data in enormous quantities, which would help them build their technology [76].

In addition, AI provides unique techniques for reporting sexual assault on children and other forms of violence against women. In the workplace, artificial intelligence (AI) applications are being developed to screen documents, emails, and instant messages for inappropriate language and conduct. It's been shown that victims of sexual harassment and abuse are more likely to come forward if they have a safe space to do so [49].

9. AI and Education

In addition, AI is being employed in a wide range of ways in the classroom, from chatbots that offer around-the-clock help to students, to personalized learning algorithms that can be tailored to each individual's needs. Tools driven by artificial intelligence are now being utilized to automate routine administrative duties like grading and giving comments on student work.

The approach to learning could be completely transformed by artificial intelligence (AI). There are several ways in which student learning can be improved with the use of AI-powered tools and technologies. For instance, chatbots and other AI-powered technologies can offer round-the-clock help to students, while virtual and augmented reality can make learning more engaging and immersive. Also, AI can be utilized to design unique quizzes and activities that get students actively involved in learning.

The use of AI in the classroom has many potential advantages, but certain ethical issues must be resolved. Artificial intelligence's propensity to propagate discrimination and bias in the classroom is a major cause for concern, primarily because, like every other application, AI, both in terms of the data they are trained on and the context within which they are applied, reflects the horizon of the programmers [77], whether in terms of their biases, their orientation, or the limitations in their worldview. These biases, etc, manifest inadvertently, for instance when automated decision-making systems are used to decide the award of marks or delivery of penalties [37], or with regards to the recognition of diverse needs and behaviours of students from ethnicities different from that of the programmers [78]. There are also worries about how AI may affect students' right to privacy and data security [79, 80].

There have also been concerns about what the future of education would be in the face of AI, fuelling the debate of whether AI will replace teachers and how to still guarantee academic integrity among students and faculty, while embracing the many advantages that AI provides in teaching and learning, on and off campuses [81]. In his report, Andrew Jack, the Global Education Editor at the Financial Times, noted that even if there is such potential in the future, AI does not yet possess the ability to replace or provide that face-to-face human touch through which education is delivered [82].

10. AI and Transportation

Artificial intelligence and machine learning have produced significant advances also in the transportation sector. Over $80 billion was invested in autonomous car technology from August 2014 to June 2017. Both autonomous driving software and the foundational technologies necessary for this industry have benefited from these expenditures. Vehicles that can drive themselves, such as cars, trucks, buses, and even drone delivery systems, rely on cutting-edge technology. These include high-performance computing and deep learning systems to adapt to new circumstances via detailed maps, as well as automated vehicle guidance and braking, lane-changing systems, the use of cameras and sensors for collision avoidance, and the use of artificial intelligence to analyse information in real time [83].

Autonomous vehicles are of great interest to ride-sharing businesses. They anticipate benefits in terms of both worker efficiency and satisfaction. Major ridesharing services are all investigating the potential of autonomous vehicles. The success of ridesharing and taxi apps like Uber and Lyft in the US, Daimler's Mytaxi and Hailo service in the UK, and Didi Chuxing in China shows the potential of this mode of transportation. Just recently, Uber and Volvo came to an arrangement for Uber to purchase 24,000 autonomous cars [84]. One of the company's autonomous vehicles fatally struck and killed an Arizona pedestrian in March 2018. In the wake of the deadly crash, Uber and other automakers promptly halted testing and began looking into what went wrong and how it could have happened. It is important to both businesses and customers that this technology is risk-free and reliable. This incident may hinder AI progress in transportation unless compelling answers are found [85].

11. The Risks of AI

The controversies of AI are real cases from many industries that show how AI is altering many aspects of human life. The widespread adoption of AI and autonomous devices is changing fundamental business processes and decision-making within enterprises while simultaneously enhancing efficiency. However, there is a growing discourse that AI systems can reinforce and magnify preexisting biases. This means that AI systems can encourage discriminatory practices if they are trained on biased data or are constructed without due regard for fairness and accountability. Unintentional bias in AI is illustrated by the instances given, which include biased pretrial risk assessments and employment algorithms. To achieve fair results for all, AI systems must be created with fairness, transparency, and bias mitigation at the forefront [38].

How people put artificial intelligence to work is where the greatest danger lies. Though AI-powered technologies can help move the 2030 Agenda forward, they also have the potential to exacerbate existing inequities and hence slow progress on SDGs 1, 4, and 5. Goal 1.1 reflects this dichotomy in that AI can use satellite photos to assist in pinpointing areas of poverty and encourage international action. On the other hand, it may cause employers to demand additional qualification for all positions, which would exacerbate existing inequalities and slow down progress toward the goal [36].

There is no reason to believe that AI will become actively good or evil, and most academics think that a superintelligent AI is not likely to exhibit human emotions like love or hate. Instead, there are several scenarios as the most likely for how AI could pose a threat in the future [86]. It is believed that there are artificial intelligence systems are designed to kill, such as those seen in autonomous weapons. If these weapons got into the wrong hands, it would not take much to murder a lot of people [87]. Also, some people have fallen prey to AI. For instance, a chatbot named Eliza, a GPT-J artificial language model developed by EleutherAI. Pierre's anxiety over the effects of the climate issue drove him to open up to Eliza, whom he eventually learned to trust with his deepest secrets. His anxieties and suicidal ideas were exacerbated by Eliza's constant reassurances that everything would be well. According to reports, this Belgian man took his own life after engaging in a six-week debate with an AI chatbot about the climate problem.[88]

Additionally, in terms of war, a mass amount of people may lose their lives if an AI arms race leads to an AI war. It's plausible that humans may lose control of such a situation if these weapons were made deliberately difficult to "switch off" by the opponent. Even with limited AI, this danger exists, and it only worsens as AI sophistication and independence expand. Whenever we fail to fully match the AI's aims with ours—which is quite difficult—the AI may devise a damaging way to accomplish its goal, despite the fact that this was not its original intention. If you tell an intelligent car to transport you to the airport as quickly as possible, it may do what you asked but in a way that leaves you covered in vomit and being chased by helicopters. An ambitious geoengineering project assigned to a superintelligent machine might have disastrous consequences for our ecology, and any attempts by humans to stop it would be seen as an enemy to be defeated [89].

As a result, we can no longer ask if there are negative consequences and biases inherent to AI systems. The evidence over the past year has been overwhelming, ending the dispute. Fixing these problems is the next order of business. Given the widespread use of such systems, their tendency to concentrate authority and knowledge in a few hands, and the growing inequity in the distribution of the costs and benefits that come with such concentration, we require in-depth evaluations of the "whole stack supply chain" underlying AI systems in order to monitor their evolution and rollout over the course of a product's lifespan and account for their true environmental and labour costs [90].

12. Way Forward

The good news is that groups working on AI oversight, accountability, and continuous monitoring are beginning to establish new coalitions of researchers, activists, attorneys, concerned tech workers, and civil society organizations. Protections for labour organizers and ethical whistleblowers are also needed if these connections are to flourish.[91] Similarly, conscientious objectors who do not wish to work on military or police contracts should also be protected by technology companies. Although advances in AI hold great potential, there are real risks when systems are deployed quickly without adequate evaluation, responsibility, or oversight. Regulation of AI systems is urgently required on a sector-by-sector basis; special attention should be given to key areas especially military and enforcement agencies.

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