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Envisioning the future: The growing impact of Artificial Intelligence on society

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Abstract

This review explores the transformative potential of artificial intelligence (AI) as part of society. The integration of AI can revolutionize every aspect of daily life, including healthcare, economy, education, and architecture, by enhancing efficiency, sustainability, and personalization. These advancements have the potential to significantly improve the quality of life of individuals and communities. However, the widespread adoption of AI also presents considerable challenges, such as job displacement, increased dependency on automated systems, and the risk of critical system failures. Given these concerns, there is a growing need to establish comprehensive ethical, legislative, and social frameworks to mitigate risks while maximizing the benefits.

Keywords: Artificial Intelligence; Society; Education; Automation; Ethics; Legislation

1. Introduction

Artificial Intelligence (AI) refers to systems capable of performing tasks that typically require human cognitive abilities, such as problem-solving, learning, reasoning, perception, language comprehension, and decision-making [1]. Advanced AI systems are designed to adapt to new environments, recognize patterns, and make predictions, enabling their application in various fields, including healthcare, finance, autonomous driving, and customer service [1]. Researchers and engineers are continuously developing more advanced algorithms, improving machine learning techniques, and creating new models that push the boundaries of what AI can achieve. A recent nationally representative United States (US) survey revealed that around 40% of Americans use AI regularly in their daily life [2]. This number is expected to grow exponentially by the end of 2030 [3]. Many ethical and social challenges emerge with this rapid pace of AI usage and its expanding influence on various entities such as healthcare, economy, education, and human interactions [4]. As AI becomes increasingly embedded into our daily lives, the critical question arises: Will AI become our greatest ally in unlocking human potential, or will it redefine humanity itself? Hence, exploring the transformative potential of AI in society is crucial to providing a comprehensive framework for users, policymakers, and scientists to navigate the complexity of AI.

2. Literature review

2.1. The Promising Opportunities

Introducing AI into our daily lives promises transformative changes to improve our quality of life. One of the most anticipated technologies is AI-powered smart homes and smart cities that increase efficiency and comfort [5]. It was reported that smart houses will feature mirrors with facial recognition capable of customized recommendations on skincare and make-up. Smart windows equipped with sensors could automatically adjust lighting and temperature

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based on environmental changes. In the kitchen, sensors will monitor the freshness of food and automate food restocking [5]. Smart cleaning will involve AI algorithms that recognize dirt accumulation and high-traffic areas and adapt to seasonal changes [6]. Furthermore, in 2016, the US presented 12 smart city initiatives for seven different cities. By 2035, the US plans to invest 41 trillion USD into smart cities that include connected transportation, 5G, and electrical vehicles [7]. AI will allow the building of cities and houses that are not only sustainable but also attuned to the needs and well-being of residents.

In addition, AI will revolutionize the education system by delivering personalized learning experiences [8]. AI could analyze a student's data (e.g. performance history, learning preferences, engagement level...) and then tailor the conveyance of information like one-on-one tutoring [9]. Another aspect of future AI in education is immersive learning. Engineering students could explore 3D models using augmented reality (AR), and medical students could practice surgical procedures using virtual reality (VR), enabling hands-on interactive and engaging learning experiences [9]. Immersive learning will assist teachers and make high-quality education widely available and inclusive, and increase academic achievements [10].

AI can improve quality of life by enhancing mental well-being through personalized virtual companions and emotional support systems. AI-powered chatbots and virtual assistants can provide companionship, detect signs of stress or anxiety, and offer tailored coping strategies [11, 12]. These systems can help individuals manage loneliness, provide mental health resources, and even suggest relaxation techniques, ultimately promoting emotional well-being and reducing stress in daily life.

2.2. The Pressing Dangers

As AI continues to advance, it introduces troubling challenges that put daily lives at risk. A major concern is widespread unemployment as a result of job automation, leading to economic instability. McKinsey Global Institute reported that 60% of occupations can be automated, 70% of companies plan to adopt generative AI by 2030, and a projected 1.1 million jobs will be lost by 2030 [13]. Data input, customer support, and even professional occupations like banking may be automated. This can result in mass unemployment in sectors that mostly depend on repetitive routine tasks [14]. Low-skilled workers typically hold positions vulnerable to automation, worsening existing disparities and increasing the gap between the rich and the poor. This automation could additionally lead to a decline in creative efforts and an increase in AI dependency and laziness, particularly in decision-making and problem-solving issues [15, 16].

On top of unemployment, AI is prone to malfunction and errors. As AI accumulates errors, it leads to distorted and unreliable results, a phenomenon known as "model collapse" [17]. This issue affects companies, technology, and the whole digital environment, resulting in costly mistakes. To prevent model collapse, it's crucial to train AI continuously on high-quality, human-generated data. However, as machine-generated content increases online, this becomes more challenging. Wanger points out that AI produces gibberish when trained on too much AI-generated data [18].

As AI becomes more integrated into daily life, there is a risk of losing genuine human connection [16]. Overreliance on AI-driven interactions, including customer service, companionship, or social engagement, could reduce meaningful human-to-human interactions [19]. This shift may lead to increased loneliness, diminished empathy, and weaker social bonds. If AI replaces emotional connections rather than enhancing them, society could face a decline in authentic relationships and a greater sense of isolation [19].

3. Perspectives and Recommendation: Black, white, or gray magic?

The future of AI is largely gray, heavily influenced by control and regulation [20]. Without proper oversight, AI systems may develop unpredictably and dangerously. For example, the idea of Singularity (i.e. when AI hypothetically surpasses human intellect) highlights the possible dangers of unchecked expansion [21]. Experts like Stephen Hawking have warned us that AI may behave in ways that jeopardize human safety: "It would take off on its own and re-design itself at an ever-increasing rate", as he elaborated in his book Brief Answers to the Big Questions [22].

Regulation of AI is still in its infancy, underscoring the need for a comprehensive code of ethics and legislative framework for its use and development [20]. Despite the introduction of the AI Research, Innovation, and Accountability 2023 Act (S.3312), there remains a lack of unified federal legislation in the US. A legal framework would ensure accountability, guard against abuse, and guarantee responsible development, while the ethical criteria would ensure AI aligns with human values.

The controls and regulations we set today will significantly impact AI in the future and guarantee that it will effectively and safely serve societies.

4. Conclusion

In conclusion, AI has the power to transform our daily lives by providing promising opportunities like immersive and personalized learning, chatbot companions, and smart houses and cities. AI also poses pressing dangers such as loss of human connection, decrease in creativity, model malfunctioning errors, and unemployment due to automation. At this point, AI's futuristic outcomes are uncertain and depend on how we will interconnect with AI evolution. As J.K. Rowling once said, "We've all got both light and dark inside us. What matters is the part we choose to act on." The pivotal action at present is to build a comprehensive legislative framework and code of ethics for a stern foundation in support of users, scientists, and policymakers.

Compliance with ethical standards

Disclosure of conflict of interest

None of the authors declare any conflict of interest related to this work.

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