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The shortcomings of artificial intelligence: A comprehensive study

Stevie A. Burke* and Ammara Akhtar

Clean Community Inc[a], North Carolina, United States.

Artificial intelligence is considered one of the highly disruptive innovations of the 21st century that has garnered the enormous attention of the global community. Artificial Intelligence (AI) provides unprecedented widespread opportunities for revolutionizing and upgrading the infrastructure of various industries. It is one of the faster-growing go-to technologies for global industries allowing personalized experiences for all individuals. This disruptive technology is evolving and getting smarter daily, offering unique and incredible applications, including robots, facial recognition, customized user experience, language comprehension, voice assistant, and autonomous vehicles. In this study, various challenges regarding implementing AI in diverse fields of human lives were discussed. Indeed, AI is a long-standing controversial topic and is sometimes illustrated negatively. In an ongoing debate, some would refer to it as a blessing in disguise for businesses and industries. In contrast, others would refer to the artificial intelligence technology as an endangerment to the existence of humans due to its potential ability to take over and overpower humankind.

Key words: AI, Artificial intelligence, Robots, ChatGPT, Machine learning.

INTRODUCTION

During the last few years, the evolution of AI technology has certainly attained significant achievements, and deep understanding is one of its distinguished manifestations (Figure 1). AI is defined as a machine's ability to perceive, synthesize, and perform actions that lie within the range of human intelligence. The most prominent aim of AI is to program computers to mimic humans and do their work. AI is usually undertaken in combination with machine learning and data analytics. AI is being used to automate processes across many industries, including finance (Culkin and Das, 2017), tourism (Li et al., 2019), education, information systems (Chi et al., 2020), marketing, and healthcare. It is

responsible for incorporating fresh vitality into digital businesses by facilitating the development of intelligent devices and promoting the digital revolution. According to a report, it is stated that approximately 70% of world organizations will transform their digital strategies by developing AI infrastructure in the future (Goasduff, 2021).

AI can alter the interaction between different businesses and their customers (increasing productivity and improving effectiveness), thereby maximizing business profit. Online companies adopt chatbots to offer their consumers full-time services (Luo et al., 2019). AI-based robots are employed to assist

*Corresponding author. E-mail: stevie@cleancommunityinc.com.

Artificial intelligence

Which allow machine to simulate human behavior

Machine learning

A subset of AI that uses algorithms to allow machine to improve with experience

Deep learning

A subset of machine learning based on artificial neural networks that improves functions with representation learning
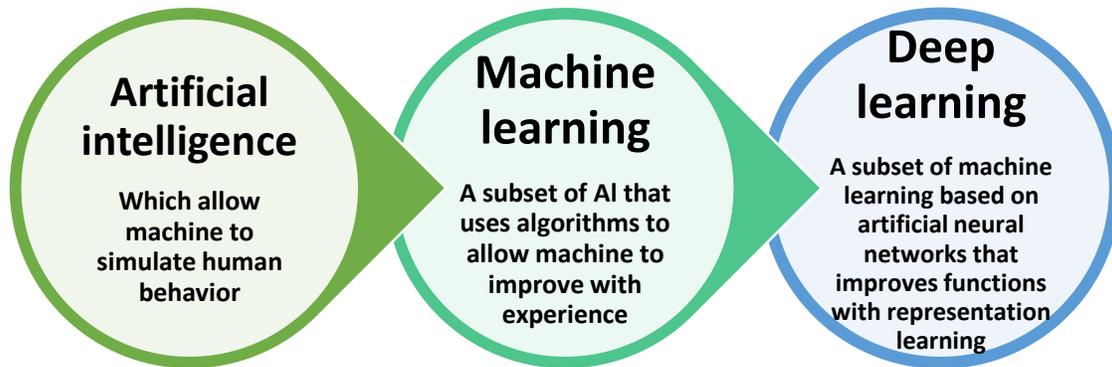
Figure 1. The difference between AI, machine learning (ML), and deep learning (DL).
Source: Jenis et al., 2023

customers in selecting the right products. In the healthcare system, artificial intelligence-based diagnostic systems allow rapid medical imaging, improved treatment planning, and faster diagnostics (Ploug and Holm, 2020). In the transportation industry, the manufacturing of autonomous vehicles has grabbed massive attention from different sectors (Radhakrishnan and Chattopadhyay, 2020). Additionally, AI-based technologies, including deep learning, voice assistant, facial recognition (Xu et al., 2021), image processing, personalized learning, and language translation, are bringing convenience to various aspects of human lives (Bhutoria, 2022). Despite these advantages, AI can potentially induce numerous negative consequences at different individual and organizational levels (Alt, 2018; Cheng, 2022). Currently, the positive features of AI are receiving massive attention, while little is paid to the negative ones.

Considering the availability of limited research on the downsides of artificial intelligence, this study was conducted to provide insight into the dark realm of AI and encourage the researchers to study and explore the risks associated with using artificial intelligence. AI undoubtedly has the potential to bring technological innovation in numerous contexts, but we should not overlook the detrimental consequences associated with using AI (Floridi et al., 2021).

THE SHORTCOMINGS OF AI

Artificial intelligence is omnipresent, and the belief of it becoming hostile against us is not new, as history is full of warnings ranging from famous sayings like the one by Elon Musk that "AI is far more dangerous than nuclear weapons" (Castagno and Khalifa, 2020). Stephen Hawking's said that "the progressive development of complete AI could fully demolish the human race as this disruptive technology has the potential to fully re-design

itself at a constantly increasing rate, while humans that exhibit steady biological evolution rate would not be able to compete and therefore could be potentially superseded" to the bulk of movies signifying the danger of AI turning from a faithful companion to an evil enemy (Curchoe and Bormann, 2019). Artificial intelligence has different cons, including high costs to create machines that mimic humans, inability to think outside the box (lacking creativity), displacing human occupations with robots, promoting human laziness, and the bulk of others. From the societal perspective, artificial intelligence is yielding various dark impacts ranging from data security to privacy issues, ethical problems, and workforce replacement (Dwivedi et al., 2021) (Figure 2).

Data bias

AI has the potential to integrate the bulk of data and modify it in a way that leads to the development of selection tools, AI-based predicted models, and pattern recognition. However, unfortunately, the AI-based science of "bulk data" employing computational strategies of big data sets to recognize unique patterns and connections has significant challenges. These challenges include data bias, data accessibility problems, data security, and ownership issues. The algorithms used in ML go through a training phase and is dependent on sufficient data input. Any systematic errors or inexactness during the steps of DL can substantially cause bias amplification or the absolute disregard of specific kinds of data. For instance, in the healthcare field, if the data in the training stage only includes embryos selected for transfer, the training dataset will not be representative of the entire embryo dataset that it is supposed to be used on later. This can induce data bias in the embryology laboratory (Curchoe and Bormann, 2019).
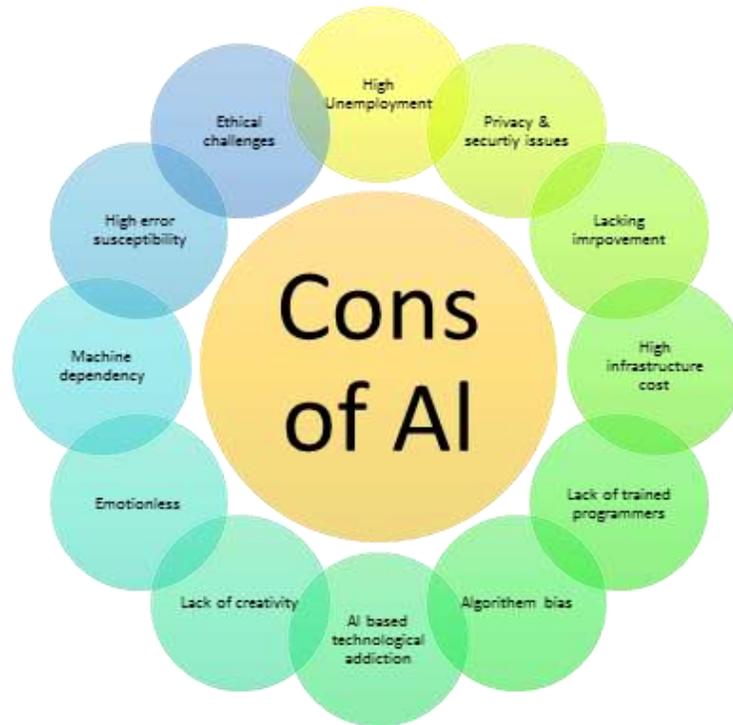
Figure 2. The cons of AI.
Source: Authors

AI carbon footprint

The carbon footprint of AI is another emerging and debatable ethical concern related to artificial intelligence technologies, with a truly global dimension. The increasing prevalence of artificial intelligence technologies has brought about a growing apprehension regarding the AI carbon footprint and its potentially devastating impact on global warming. The emission of greenhouse gases (GHG) is driven by the electricity and computational resources required to train AI models using machine learning methods (Tamburrini, 2022). Strubell et al. (2019) conducted a study to calculate the carbon footprint of training an AI-based model in "Natural language processing" (NLP). They reported that the training of this AI-based model could potentially emit greenhouse gases equivalent to those emitted by five automobiles. Furthermore, it has been noted that the estimated carbon footprint varies based on factors such as location, overall demand, and global disparities in power sources. For instance, the training of the AI-based model "BERT" was found to release approximately 22-28 kg of carbon dioxide in a US data center, which is twice the amount of emissions generated by conducting a similar experiment in Norway (Gibney, 2022).

Failure of chatbots

AI technology has been widely employed as a problem-solving tool that provides high efficiency and increased effectiveness. Recently, a chatbot named Chatbot" ChatGPT has been gaining widespread attention from people around the world. ChatGPT is an AI-based chatbot developed with the latest version of OpenAI and launched at the end of 2022. Although there is much hype globally, in practice, like any other chatbot, these AI-based chatbots have raised several disadvantages, including lack of expression, no feelings, lack of insight, divergence, and inaccuracies (Susnjak, 2022). Hence, AI-based chatbots are not working as intelligently as people expect. For instance, a recent report based on FB project M presented by Griffith (2018) showed that 70% of the interactions between AI and humans failed. Another piece of information submitted by Forbes showed that approximately 80% of the customers that use e-commerce websites are reluctant to communicate with AI chatbots since they cannot perceive their actual needs (Forbes, 2021).

High error susceptibility

Personal virtual assistants (PVAs) are recently gaining significant popularity and becoming a prominent feature of mobile devices. Contrary to its growing use in the private context, the persistent implementation of PVAs at the organizational level has experienced widespread employee resistance. The execution of a specific task by using PVA on a smartphone device is quite simple but

somewhat complex at the corporate level (Adam et al., 2021). The employees in an organization can rarely act on their own as there is a kind of interdepending environment within an organization, and the failure of PVA can severely impact the organization at many levels (such as, financial loss). Moreover, the fear of job loss is another significant factor in employee resistance to PVAs. The prospect of PVAs causing confidential data leakage is one of the fundamental reasons for mistrust among individuals working in large organizations. Hornung and Smolnik (2022) designed a framework to study the role of artificial intelligence in invading the workplace and found the presence of negative emotions and dissatisfaction among employees regarding using PVAs at an organizational level.

Privacy and security concerns

At the individual level, the adverse effects of artificial intelligence are generally reflected in exacerbating privacy concerns. AI has the potential to get deep insights into the lives of users, thereby significantly inducing significant privacy risks. The electronic marketing industry uses AI for content and product recommendations (Grewal et al., 2021). Dickson (2019) reported that AI-based voice assistant like Alexa has the potential to predict the status of an ongoing relationship between a consumer with a marketer by analyzing the tone of voice of the consumer. A recent study by Seo et al. (2022) reported that consumers are still hesitant to use voice assistants for online shopping due to privacy issues. AI-based facial recognition for online payments can induce numerous privacy risks because the human face can reveal much personal information like age, gender, and appearance. Moreover, online recommendations based on previous searches and personal experiences can eventually lead to privacy concerns and perceived information narrowing. Therefore, people are often reluctant to rely on these technologies (Li et al., 2021).

Promoting addictive behaviors

Due to its growing demand in the tech industry, the term "addictive" is observed as one of the greatest compliments given to an artifact. Due to the emerging paradigms based on AI-based technologies, the importance of research connected with addictive digital behaviors is also evolving. Current research focuses on exploring the approaches and methods used by tech companies that ultimately lead to addiction (Ferreri et al., 2018). The development of novel AI-based designs has been reported to be responsible for promoting addictive technology that is growing massively and becoming harder to resist. Moreover, AI and concomitant ethical

debates bring novel perspectives on these addictive designs. AI-based algorithms have the potential to reshape the various aspects of human lives. With the development of novel algorithms capable of learning every user's experiences, habits, and schedules, addiction is expected to be attained at a comprehensive level along with sufficient granularity (Berthon et al., 2019). These addictive properties are generated by machine learning's ability to optimize the computable measures of engagement (Fourcade and Johns, 2020). According to a health standpoint, the excessive use of the internet, binge-watching of videos, obsessive use of social media, and problematic online game playing are some behaviors that can be assumed addictive (Burke et al., 2022). This so-called addiction induced by technology is now recognized as a proper health disorder (Vahia, 2013).

From an economic perspective, the growing need for these addictive technologies can be correlated with the new business models developed to capture and retain the user's attention (Bhargava and Velasquez, 2021). Diverse business companies and manufacturers widely employ AI-based algorithms to promote their services and various available products. For instance, these AI-based business strategies can be considered responsible for the exposure of adolescents and adults to content (either in the form of images, videos, or texts) related to pro-substance use, which has been further reported to be associated with high chances of substance use or substance addiction among those individuals (Burke et al., 2022). Indeed, addictive behaviors are becoming more common due to these addictive technologies. Furthermore, it would not be wrong to say that as our ability to detect addiction by using technology grows, so does our capability to substantially develop software and create experiences that progressively lead to addiction.

Promoting dark patterns

As these technologies are relatively emerging, different addictions are also being identified. The strategy used for gaining such user experiences includes using numerous sophisticated deceptive techniques to deliberately turn the knowledge collected from the users ultimately against them, also known as "dark patterns." These patterns are generally user interfaces intentionally developed by the designers to purposely manipulate or confuse the users by making it complicated for the users to demonstrate their actual preferences (Luguri and Strahilevitz, 2021; Waldman, 2020). For example, a video app called Tik Tok is developed to collect information about its users, including the content they watch, their caption, their location, the total time of use, and even the emotions that the video will develop. This bulk of data is consequently employed to do large-scale

collaborative filtering and developing links that surpass human abilities, thereby giving a unique experience to each user that complements the neurodiversity of every individual user and makes it more addictive (Zhao, 2021). Famous social websites like YouTube, Facebook, Instagram, and others employ similar algorithms and AI-based engines. Mentioned above are some of the ways t developed by artificial intelligence to make users more addicted. Although the harms caused by these AI-based designs on the users are apparent, tech companies continuously design such experiences to be more irresistible (Sin et al., 2022).

High rate of unemployment

Business organizations face significant challenges in successfully executing artificial intelligence strategies in their current business models. Moreover, they have failed to address the grave problem of how this technology will impact the human workforce. One of the most significant alarming concerns of AI is its potential to cause large-scale human unemployment globally, and this mass unemployment is not only expected within e-commerce, but as this technology is rapidly evolving, this could enormously impact global labor markets and eliminate jobs in all walks of life (Danaher, 2019). Though this argument might sound satirical, it is relatively instructive in the sense that it illustrates the idea of how the rise of AI can have an impact on the human world.

CONCLUSION

Artificial Intelligence has been around for many decades, but it has been evolving rapidly and recently sparking primary interest among business enterprises, widely becoming one of the hottest trends of 2023. As with every emerging technology, AI is also a source of excitement and skepticism. Artificial intelligence has several challenges, and people are expressing their anxiety and dissatisfaction over the prospects of AI, wreaking havoc in the lives of humans. Undoubtedly, the impact of artificial intelligence on the global industry is irrefutable, and the most significant role humans can play in this perplexing situation is to ensure that this technology does not get out of hand. There is a dire need to improve artificial intelligence literacy and upskill to get the most out of it. Moreover, there is a need for more research to overcome numerous challenges before we can admit the immense transformational potential of this emerging technology.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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