

THE APPLICATION OF ARTIFICIAL INTELLIGENCE: CHALLENGES FOR TECHNOLOGY FROM SOCIAL AND ETHICS PERSPECTIVES

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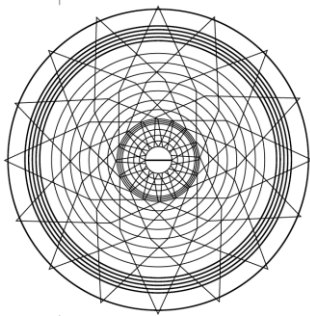
Abstract:

In the 21st century when we embrace the Fourth Industrial Revolution with the various technologies such Big Data, Internet of Things, Internet of Everything, Cloud computing, Blockchain, cryptography, 5G, Artificial Intelligence and many others converging with one another, there is an inherent fear among the people that technology such as Artificial Intelligence (AI) will one day take over the human population. The fear was expounded by the screening of several movies about robots and robotics taking over the human population. The application of Artificial Intelligence actually has many benefits that could enhance the technologies being used currently and will bring more advantages in the coming years. However, Artificial Intelligence has brought forth several discussions about its application from social and ethical perspectives. It has led to various arguments about the usage which could be deemed as unethical and challenges the norms of social practices. Furthermore, Artificial Intelligence, in the hands of unscrupulous criminals will be used for their nefarious objectives which could lead to severe challenges to the authorities. From its noble beginning, Artificial intelligence was a computer science specialty concerned with creating systems that can replicate human intelligence and problem-solving abilities but now the technology itself can be tweaked to do something more ominous and dangerous. In order to maintain and sustain the proper use of Artificial Intelligence, there must be some kind of regulation and enforcement in place to ensure that Artificial Intelligence is not applied for negative activities.

Keywords: artificial intelligence, challenges, sociology, ethics, emerging technology, interaction

Introduction

In this digital age, new technologies are emerging, legacy systems are gradually being replaced, and existing technologies are being reinvented and advanced. Technology is always evolving. In the last few years, the world has seen rapid growth as



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digitalization and the COVID-19 pandemic became a catalyst for pushing ahead into the Fourth Industrial Revolution. Cloud technology, blockchain, cryptography, 5G, and Artificial Intelligence (AI) are the most frequent technology news that reaches the public ears and eyes. New technologies, especially AI, have caused quite a stir when it was thought that AI would one day replace humans in most work-related tasks and pose a threat to their capacity to find employment. With artificial intelligence (AI), machines are taught to mimic or even take over human intelligence and behaviour.

The release of movie "*I, Robot*" (2004) by Alex Proyas made this issue worse and increased human anxiety¹. Robots were given AI memories and used to work for the people in the movie, but eventually, the robots rebelled, went berserk, took over the cities, and attacked the humans. People are hesitant to use AI technologies because of the true fear that exists.

Definition

The term Artificial Intelligence might sound like something new that was the result of the Fourth Industrial Revolution (4IR). It was first coined by John McCarthy in 1956 when he first used the phrase Artificial Intelligence². Alan Turing, who made major contributions to mathematics, cryptanalysis, philosophy, and computer science, in his book '*Computing Machinery and Intelligence*' (Turing, 1950) proposed a test of machine intelligence called The Imitation Game.

The word "Artificial Intelligence" consists of two words: "Artificial" and "Intelligence". "Artificial" refers to something made by humans or non-natural, and "Intelligence" means the ability to understand or think. There is a misconception that Artificial Intelligence is a system, but it is not. AI is implemented in the system. As John McCarthy describes AI (McCarthy, 2007):

It is the science and engineering of making intelligent machines, especially intelligent computer programs. It is related to the similar task of using computers to understand human intelligence, but AI does not have to confine itself to methods that are biologically observable.

Therefore, AI aims to enhance the capabilities of a machine to replicate the intelligence that humans possess.

Artificial intelligence is a computer science specialty concerned with creating systems that can replicate human intelligence and problem-solving abilities. They do this

¹ Similarly, in other movies include *Skynet* from "The Terminator" (1984), *HAL 9000* from "2001: A Space Odyssey" (1968), "The Matrix" (1999) and many more.

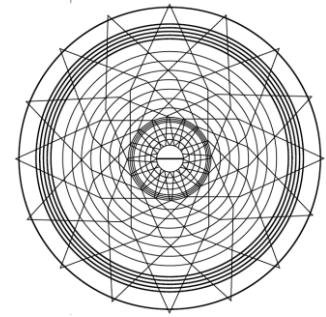
² Dartmouth.edu. (n. a.). Artificial Intelligence Coined at Dartmouth. <https://home.dartmouth.edu/about/artificial-intelligence-ai-coined-dartmouth>

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by taking in a myriad of data, processing it, and learning from their past to streamline and improve in the future. A normal computer programme would need human interference to fix bugs and improve processes.

Artificial intelligence (AI) is currently at the centre of several arguments about its applications (technological), the use of AI in work-related situations, the use of AI in human interaction (social), the regulation of AI to a set of moral principles and practices that aim to guide the proper creation as well as the usage of AI technology in society (ethics).

Background

The use of Artificial Intelligence has been extensively researched. Throughout the early 20th century, AI has been discussed, researched, invested in, then dropped and repeated until the first decade of the 21st century, when AI can be seen as fully operational for public use. AI was developed through algorithms and techniques for solving problems that are capable of imitating human intelligence or at least passing the Turing Test.

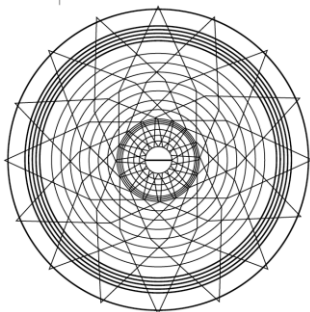
The illusion of understanding and having a conversation with a human is the target of various AI developers, i.e., the ability to mimic human interaction with smooth interaction with no hiccups. AI of today already passed the Logic Theorem or General Problem Solver of the past, as it features planning, creativity, prediction and recovery, knowledge representation, problem-solving, decision-making, and social intelligence.

Furthermore, in addition to the above, AI has made significant progress in areas such as natural language processing, image and speech recognition, robotics, manufacturing, healthcare, finance, and slowly creeping in the music and film industries. AI has brought forth the industry to the new generation by increasing productivity and capacity, predicting demand, and, in general, future growth and expansion.

Geographically, the concentration of AI-using industries is currently mostly located in North American and European continents, China, Japan, and Korea. In the South and Southeast Asia region, the usage and application of AI are still limited to heavy industries and research areas as exposure to AI applications is limited in these regions. Thus, there is limited research done on the effect of AI ethics on the population and development.

Social and Technological Challenges of Artificial Intelligence

Artificial Intelligence (AI) has undoubtedly transformed various aspects of our lives, from powering virtual assistants like Siri and Alexa to enhancing medical diagnostics and automating manufacturing processes. However, with its rapid advancements, AI also presents a range of technological challenges that need to be addressed to harness its full potential while mitigating potential risks.



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A significant area of concern lies in the integration of Artificial Intelligence into business processes and social media platforms. As the world embraces AI, it opens new avenues for cyber attackers to exploit certain AI functionalities. For instance, AI can be harnessed to disseminate false information and sow chaos by spreading fabricated news, potentially impacting a substantial number of susceptible individuals. This nefarious use of AI might also encompass the dissemination of seditious comments, the promotion of hate speech, or even the incorporation of racial undertones.

Achieving 100% precision in AI-driven decision-making is a formidable challenge due to inherent irregularities and flaws in the data collection process, leading to biased outcomes. The presence of outdated information, incomplete data, or low-quality data compounds the issue, exacerbating the inaccuracies in AI results. In addition, AI is being utilized more by cybercriminals due to its profitability which, in turn, emerges as a paramount concern for cybersecurity, demanding robust defences to safeguard both infrastructure and sensitive data.

Simultaneously, the issue of data privacy is driven by the widespread collection of personal information, prompting concerns about privacy rights, and necessitating a delicate balance between AI growth and the preservation of personal privacy. Regulations and policies are having a monumental challenge in the ever-changing AI landscape. The compatibility challenges impede the seamless integration of AI with existing technologies, potentially requiring costly upgrades or adjustments to ensure adaptability and interoperability across diverse systems.

Amid the progress of artificial intelligence, there is a growing recognition of the profound ethical challenges that AI presents. These challenges revolve around the ethical dilemmas and moral quandaries that arise from the deployment of AI systems in various aspects of our lives.

The advent of Artificial Intelligence (AI) has undoubtedly brought about transformative advancements in technology, promising increased efficiency, automation, and convenience across various sectors. However, along with these benefits, AI also poses a set of significant social challenges that demand careful consideration and proactive management. These challenges are multifaceted, touching upon various aspects of our society.

Currently, there's a big concern about AI replacing human jobs. As AI generative can create logical and creative articles or art which makes it more discerning of AI generative creation between human results and AI. Midjourney AI³ or DALL-E 2⁴ software and

³ Midjourney. (n. a.). <https://www.midjourney.com>

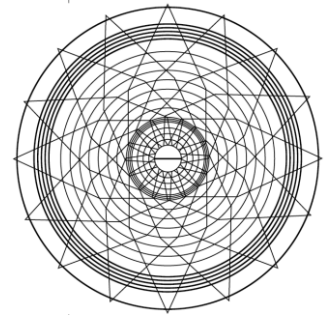
⁴ OpenAI. (n. a.) DALL-E 2 is an AI system that can create realistic images and art from a description in natural language. OpenAI.com. <https://openai.com/product/dall-e-2>

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services can create thousands of rendered images from user descriptions. Music and short films are also being created by AI which can be seen within various social media platforms.

Not to mention, the famous or infamous depends on your opinions on AI, the ChatGPT. It can generate conversational text with a chatbot. It can also answer questions and assist people with tasks, such as DIYs, composing emails, essays, and stories. Nonetheless, this also gives rise to ethical issues regarding its capacity to produce fabricated or inaccurate news or other deceptive materials. Such a scenario could result in serious consequences, such as damaging reputations, disseminating false data, or even provoking violence. It is also alarming that ChatGPT can write code snippets in popular programming languages such as JavaScript, Python, C#, PHP, and Java. The dark side of this is that it teaches an unskilled hacker to hack and perform phishing attacks and write functional malware to breach a computer system or network.

Deep fakes, an AI tool, that is capable of *cloning* anyone's face to another person digitally. This advancement of AI has created opportunities and chaos within all industries. Social media utilises this tool for entertainment for all its users meanwhile being exploited by others. Currently, there is a rise of news in the entertainment industry replacing its human employees with AI technology, such as radio DJs, voice actors, writers, and even content creators of various social media platforms.

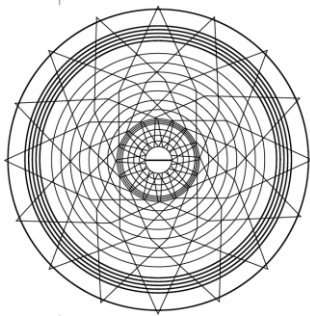
What's even more alarming is when governments employ AI and machine learning for shaping policies, legislation, or even pre-emptive law enforcement decisions. It's crucial to infuse these algorithms with a sense of moral integrity. The prevailing sentiment globally is that anyone can't prevent the integration of AI into our daily lives, decision-making processes, or automation, but can certainly create AI systems that align with human values and become an inherent part of the nation's constitutional framework.

Artificial Intelligence Attacks

Hackers have been employing AI for some time now, allowing them to target a larger number of victims while minimizing their risks.

From a technical perspective, hackers can utilize AI to outsmart security algorithms by training them on data. This leads to the expectation of increasingly sophisticated cyberattacks as hackers leverage artificial intelligence and machine learning software to boost the frequency and intricacy of their attacks on specific targets. It is seen as an ideal tool for generating strategies on whom to target, when, where, and how.

These autonomous cyberattacks may have specific targets and aims related to intellectual property. They offer cybercriminals ongoing opportunities for personal gain, financial profit, and malicious activities. As they maintain a strong presence, they can



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grow more potent by accumulating insider knowledge and gaining control over data and entire networks.

Once initiated, these self-learning attacks operate independently and don't require constant guidance from a central command. They make decisions based on predefined algorithms and instructions, often deep within corporate networks, delivering subtle, untraceable blows over time.

Artificial intelligence possesses the ability to employ data mining techniques on public domains and social networks to extract Personally Identifiable Information (PII), such as account details, identification numbers, birthdates, genders, locations, and phone numbers, associated with individuals' accounts.

AI can also automatically monitor emails and text messages and craft personalized phishing emails for social engineering attacks. Furthermore, AI can easily modify malware and ransomware. It also can intelligently search for and exploit vulnerabilities within a system.

Suggestion

To address artificial intelligence (AI) solutions is a complex and ever-changing problem that involves a variety of activities, from development and deployment to maintenance and ethical concerns. Artificial intelligence (AI) has swiftly advanced and been incorporated into many facets of our lives, revolutionising whole sectors, improving decision-making techniques, and providing creative answers to challenging issues.

Technological Approach

Requires ongoing research, collaboration among various stakeholders, and a commitment to ethical AI development. As AI continues to advance, new challenges will likely emerge, but these challenges also present opportunities for innovation and progress in the field.

Organizations should operate under the assumption that they will experience breaches. While it's crucial to focus on keeping AI-powered criminals out of the network, organizations must also acknowledge that breaches may occur and should develop a cyber resilience strategy to mitigate their impact.

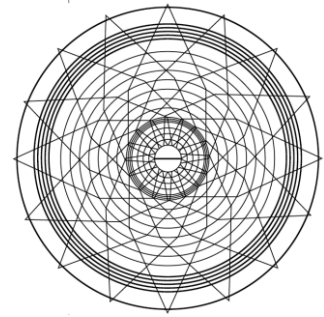
Cyber resilience takes a broader approach that combines cybersecurity with business continuity management. Its goal is to defend against potential cyberattacks and ensure an organization's survival following an attack.

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Social Approach

Requires a multi-stakeholder approach involving governments, industry, academia, and civil society. Ethical considerations, transparency, and inclusivity should be at the forefront of AI development and deployment to ensure that AI benefits society.

Education and awareness are the tools that are critical in any community. People should have at least a basic understanding of AI to make informed decisions and participate in discussions regarding AI. A simple campaign of awareness can make a difference, especially in today's fast-moving information digital world.

Ethical Approach

It is imperative to implement government oversight to ensure the responsible use of AI and machine learning, preventing them from eventually replacing human reasoning and decision-making capabilities. Organizations must also take responsibility by regulating AI systems in conjunction with traditional security measures like firewalls and antivirus software, which have proven insufficient in today's evolving threat landscape.

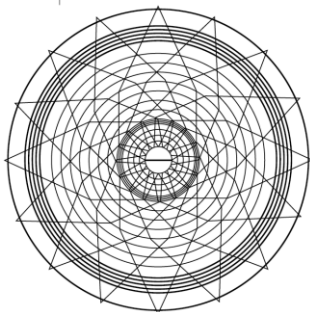
Further research is necessary to delve into the implementation of AI ethics. This updated approach to AI ethics should also encompass the need for a holistic and adaptive cybersecurity strategy, which means it cannot solely rely on technology but must also involve people and processes.

AI should be utilized as an assistant, a coach who helps along the way instead of fully replacing anyone. This can be seen with any AI tools, ChatGPT offers to reduce the workload and increase the efficiency of employees or direct them to tackle different tasks, assignments, or projects.

Conclusion

Technology, society, and ethics have undergone profound changes as a result of the rapid development of artificial intelligence (AI). While AI has a great deal of promise to advance innovation and society, it also presents a complicated set of problems that call for thoughtful analysis and proactive solutions. The following can be taken into consideration:

- To make sure that AI systems are fair, comprehensible, and reliable, it is technologically necessary to solve the issues of bias, transparency, and security. The ethical issues that AI raises are interwoven with these technical obstacles.
- AI ethically raises concerns about justice, responsibility, and the ethical application of technology. It requires us to define precise policies for the design and implementation of AI systems that put people's needs and the needs of society first, while simultaneously ensuring fair access and minimising harm.



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From a societal standpoint, AI's impact on the labour market, privacy, and social dynamics necessitates thorough adaptation techniques to avoid undesirable outcomes. The necessity for education and knowledge regarding AI's potential and limitations becomes critical as technology is more incorporated into daily life.

These challenges will be difficult to address if nations work in silos within and across their national boundaries. Addressing these challenges requires a multi-stakeholder approach, involving governments, government agencies, industry players, academia, researchers, and civil society. Ethical considerations should be at the core of AI development, guiding policies, regulations, and standards to promote responsible AI innovation.

In navigating the complex landscape of AI challenges, we have the opportunity to harness the full potential of this technology for the betterment of humanity, fostering innovation, inclusivity, and ethical use. By fostering collaboration and remaining vigilant about the ethical implications, we can work toward an AI-powered future that aligns with our values and aspirations.

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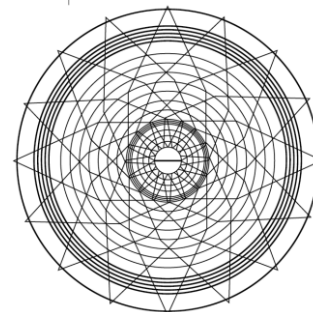
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ПРИМЕНЕНИЕ ИСКУССТВЕННОГО ИНТЕЛЛЕКТА: ВЫЗОВЫ ДЛЯ ТЕХНОЛОГИЙ С СОЦИАЛЬНОЙ И ЭТИЧЕСКОЙ ТОЧЕК ЗРЕНИЯ

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Аннотация:

В 21 веке, когда мы вступаем в Четвертую промышленную революцию, где происходит конвергенция таких технологий, как большие данные, интернет вещей, интернет всего, облачные вычисления, блокчейн, криптография, 5G и искусственный интеллект (ИИ), у людей возникает врожденный страх, что такие технологии, как ИИ, в один прекрасный день поработят человечество. Страх только усилился после выхода на экран нескольких фильмов о роботах и роботизированных системах, захватывающих власть над человеком. Применение искусственного интеллекта на самом деле имеет много преимуществ, которые могли бы улучшить технологии, используемые в настоящее время, и в ближайшем будущем количество таких преимуществ будет только расти. Тем не менее, ИИ вызвал ряд дискуссий о его применении с социальной и этической точек зрения. Это привело к различным спорам о его использовании, которое может быть расценено как неэтичное и бросающее вызов нормам социальной практики. Кроме того, ИИ в руках криминальных элементов, неразборчивых в средствах, будет использоваться для их преступных целей, что может создать серьезные проблемы для властей. В светлые времена своего зарождения ИИ был специальностью в области компьютерных наук, связанной с созданием систем, способных воспроизводить человеческий интеллект и решать различные задачи, но теперь саму технологию можно изменить, чтобы сделать что-то более злое и опасное. Чтобы ИИ применялся надлежащим образом, должна существовать какая-то нормативная база, регулирующая право и правоприменение, которая будет выступать гарантом того, что ИИ не будет использоваться для действий, несущих за собой негативные последствия.

Ключевые слова: искусственный интеллект, вызовы, социология, этика, новые технологии, взаимодействие