The AI revolution: How AI is changing us.

Article · November 2023

CITATIONS
0

READS
4

2 authors, including:

Jonas Vilaire
Universidad Da Vinci
2 PUBLICATIONS **0** CITATIONS

SEE PROFILE

The AI Revolution: How AI is Changing Us

by
Ralph Olliges, Webster University
and
Jonas Vilaire, Universidad Da Vinci, Mexico

Introduction

The earliest substantial work in the field of artificial intelligence was done in the mid-20th century by the British logician and computer pioneer Alan Turing. In 1935 Turing described an abstract computing machine consisting of a limitless memory and a scanner that moves back and forth through the memory, symbol by symbol, reading what it finds and writing further symbols. The actions of the scanner are dictated by a program of instructions that is also stored in the memory in the form of symbols. This is, Turing's stored program concept and implicit in it is the possibility of the machine operating on, and so modifying or improving, its own program. Turing's conception is now known simply as the universal Turing machine. All modern computers are in essence universal Turing machines.

AI stands for Artificial Intelligence. It is the simulation of human intelligence processes by machines, especially computer systems. Specific applications of AI include expert systems, natural language processing, speech recognition, and machine vision. The earliest successful AI program was written in 1951 by Christopher Strachey, later director of the Programming Research Group at the University of Oxford. The computers he designed were mainframes that would be housed on entire floors in buildings. His first attempts at this technology were to make the machine play the game of checkers and then chess at a relative pace that would mimic humans. In the late

1970s and early 1980s, microcomputers were created. In the 1980s, a form of AI program called "expert systems" was adopted by corporations around the world, and knowledge became the focus of mainstream AI research.

Bill Gates was thinking a lot about how AI can reduce some of the world's worst inequities. While the first cell phone was created in 1973, they did not enter the mass consumer world until the early 2000s, specifically about 2004 or 2005. When the cell phone took advantage of the internet and became more than just a device to make a call, we were primed for a revolution. The smart cell phone allowed one to access the internet and to download apps. The apps allowed us to perform tasks that we had never dreamed of before. The AI revolution is now.

Types of Artificial Intelligence

There are four primary types of Artificial Intelligence: reactive, limited memory, theory of mind, and self-awareness. Research is being performed in each of these areas.

Reactive machines. These are AI systems that have no memory and are task specific, meaning that an input always delivers the same output. Examples are the playing of checkers or chess.

Limited memory. The next type of AI in its evolution is limited memory. It is characterized by the ability to absorb learning data and improve over time based on its experience; this is similar to the way the human brain's neurons connect. An example is the self-driving car.

Theory of mind which is having empathy, moral judgment, or self-consciousness. For years, artificial intelligence has proven it can best humans at analytical tasks, but is

less capable of utilizing skills like intuition and inference. Facial expression recognition is an example of this type of AI.

Self-awareness. Google's Bard AI chatbot also appears to be self-aware by answering queries on why it helps people with the response "Because it makes me happy."

Other authors speak of the three key components of artificial intelligence. They are as follows. • Artificial Narrow Intelligence or ANI has a narrow range of abilities. • Artificial General Intelligence or AGI has capabilities as in humans. • Artificial Super Intelligence or ASI has capability more than that of humans. These authors are referring to how artificial intelligence mimics a human in ability.

Chat GPT

ChatGPT is a natural language processing tool driven by AI technology that allows you to have human-like conversations and much more with the chatbot. For example, a student could create the required essay or paper assigned by a professor such as Compare/ Contrast Chinese and Japanese Gardens. This raises the question about how professors need to re-examine how they construct assignments.

Erik Ofgang (2023) wrote in *Tech & Learning* that ChatGPT can help instructors prepare for class. First, Chat GPT can quickly generate semi-detailed lesson plans. Second, an instructor can use ChatGPT to quickly create quizzes, but instructors must still check to make sure that the generated quiz is correct. Third, ChatGPT can be used to generate homework assignments. However, the instructor may still need to tweak it.

Finally, ChatGPT can quickly create a syllabus, though one will need to provide meaning and depth, but the hardest part can be accomplished.

Be My Eyes

Think about the person in your family or a friend that is blind or has low vision. They might be able to tell if it is light or dark outside but may not be able to see much more. Suppose that instead of having to ask a person for help, they could be self-sufficient. *Be My Eyes* is an app that connects sight with low vision all around the world. Originally, *Be My Eyes* paired sighted people with those needing help. But could technology help? Instead of calling a person for assistance in describing what is around them, they simply implore an AI app to describe what is in the refrigerator or on the shelf at a store. ***Be My Eyes*** is a free app for receiving video support at a moment's notice.

Manipulating Photos

In Spring 2023, an AI-generated photo of Pope Francis appeared. It was in good taste with the pope wearing a white puffer jacket. A 31-year-old Chicago construction worker created the fake photo which went viral. Photos of other celebrities have also appeared.

Currently, one way to distinguish between an AI- generated photo and a real photo, is to look at the person's hands. Usually, in AI-generated photos, the AI has trouble rendering the fingers and/or hands. This leads us to teach the lesson to always

question everything.

Fake photo of Pope Francis wearing a large white puffer coat, created with AI-image generator, Midjourney

Problems with AI

- AI can give wrong answers, but can improve over time.
- Computers do not always understand human requests.
- Humans can use AI for good as well as for malice.

Discrimination and Bias

If not trained with unbiased data, AI may perpetuate or even worsen the existing biases that exist in our society. This situation, as highlighted by Buolamwini (2017), can result in unjust and discriminatory decisions in fundamental areas such as training, medical attention, and financial services. To proactively address this situation, it is important to:

1) Create a more inclusive and diverse database to train the algorithms, encompassing information from all demographic and cultural groups. This approach

helps minimize bias and ensures fair representation.

2) Establish an equity-based audit system that tracks, identifies, and corrects any type of bias in AI products before implementing them. This system helps ensure that AI is developed and deployed in a fair and unbiased manner.

Violation of Privacy:

The non-ethical use of AI in surveillance systems can have implications for human rights and privacy, leading to extensive surveillance and potentially oppressing minority groups (Crawford, 2021). Furthermore, interaction that takes place between people and machine is likely to be manipulated by AI. Characteristics that were only known to pertain to humans are now being perfectly imitated by AI. Examples of this are the anthropomorphic interfaces found in both Siri and Alexa. According to Stanford University (2016 report), it has become trendy for people to develop human-like relationships with AI. That is to say, people are now oversharing more personal and intimate information with a machine that has been built to respond to them like a human being would respond. This is a giant leap from the other traditional technology that until now was used to collect data.

Moreover, in terms of data generation, there has been very little talk regarding the asymmetrical relationships between the institutions and the individuals in question. This type of data tends to be traded by the current institutions. The problem here is that often, while the clients may be having a hard time dealing with data gathered through systems they do not know, the same tends not to be true the other way around since the system

has been ingesting all their information. Therefore, the system knows them well, giving the institution a clear advantage, which leaves the individuals at the mercy of a system that can manipulate them (*AI Now*, 2017).

To address this privacy issue, it is imperative to:

1) Enact laws and regulations that restrict invasive surveillance through technology and guarantee the protection of people's right to privacy. Such measures define boundaries on the use of AI in surveillance and ensure the respect of individuals' privacy.

2) Develop privacy-focused AI systems using techniques such as federated learning and encrypted data analysis. These methods enable data analysis while preserving individuals' privacy, ensuring that sensitive information remains protected.

Economic Inequality:

If the benefits of AI development are concentrated in the hands of a few corporations and individuals, instead of being distributed equitably, the automation of the workforce can lead to economic inequities.

Hence, it is imperative to: (1) Implement policies that focus on income redistribution and support educational and training pro- grams in digital citizenship. This approach ensures that everyone has the opportunity to adapt to and benefit from an AI-based economy. (2) Support innovation and competition in the AI field by sponsoring start-ups and research projects in developing countries and regions. This fosters a more inclusive and diverse AI ecosystem, reducing the concentration of power and providing economic opportunities for more individuals (*UNESCO*).

AI and Autonomous Weapons

The integration of AI is prevalent in both civilian and military applications. Algorithms have had a profound impact on sectors such as ride-sharing (e.g., Uber) and online education (e.g., Khan Academy). However, ethical concerns surrounding the use of AI in warfare and autonomous weaponry have received less attention compared to developments in AI technology like ChatGPT versions 3 and beyond.

Stuart Russell (2019) emphasizes the need for ethical guidelines in the development of autonomous and lethal weapons. He argues that the absence of clear rules could result in destructive and uncontrollable military conflicts, posing a severe threat to global security. Diverse viewpoints exist regarding the ethics of AI in lethal autonomous weapons. For instance, Jai Galliott argues against a blanket prohibition on AI in weapons, citing potential unintended consequences due to oversimplification. In contrast, John Forge contends that refraining from weapons research is the only morally acceptable course of action (Galliott & Ai, 2021).

To proactively address this dilemma, it is imperative to: (1) Establish International Agreements: Formulate international agreements and treaties to either prohibit or restrict the utilization of autonomous weapons and lethal AI-based systems; and (2) Promote Defensive and Non-lethal AI Research: Encourage research into defensive and non-lethal AI technologies aimed at safeguarding lives without endangering human beings.

Disinformation and Manipulation

AI has the potential to generate false information and manipulate news, eroding

trust in institutions, democracy, and exacerbating social polarization (Timnit Gebru, 2020). To counter this, it is essential to: (1)Develop AI systems for detection and neutralization: Create AI systems capable of autonomously detecting and mitigating false information and manipulated news online. (2) Implement digital and media literacy programs: Launch educational programs to empower individuals in recognizing and countering misinformation, fostering the ability to distinguish between reliable and unreliable information sources.

Overdependence on AI

Over Reliance on artificial intelligence systems may diminish cognitive and critical abilities use , thus reducing human contact in areas where empathy and human understanding are crucial (Fei-Fei Li, 2020). two ways of mitigating these risks could be to : (1)Design AI systems as complementary: develop AI systems that enhance human abilities instead of replacing them, emphasizing collaboration between humans and machines. (2)Establish Ethical and Legal Limits: Define ethical and legal boundaries governing the implementation of AI in sensitive areas such as healthcare and therapy, where empathy and human understanding are essential.

Use of AI in Education

Personalized Education

AI has the potential to revolutionize education by providing adaptive learning systems that cater to individual needs and skills, thereby enhancing the quality and

efficiency of education for everyone (Bengio, 2019). One practical approach is integrating school curricula into adaptive AI systems, equipping educators with the tools for personalized teaching and learning. This would enable educators to tailor instruction to each learner's unique requirements.

Another strategy is to foster partnerships between educational institutions and AI technology companies to develop and implement large-scale intelligent learning systems.

AI in the Classroom

When it comes to classroom usage, one highly sought after program is ChatGPT, as mentioned earlier. A couple of examples follow: (1) Lesson Planning: AI can serve as a valuable teacher's aide, alleviating the workload associated with lesson planning. ChatGPT can assist by providing clear lesson objectives, tasks, feedback, and more. By offloading administrative tasks to AI, teachers can dedicate more time to ensuring meaningful learning experiences for their students. (2) The Socratic Method: ChatGPT can be employed as a Socratic teacher, wherein it does not directly provide answers to questions. Instead, it facilitates deep understanding of the topic through a series of questions, promoting independent thinking and reasoning skills among students.

Conclusion

We live in an exciting age that can also be very demanding and daunting. Overall, AI-powered tools like ChatGPT hold great potential to enhance education by personalizing learning experiences and supporting teachers in their instructional practices. How will you use it? Will

you design a lesson that is not just an exercise of comparing or contrasting two items? The challenge is to create an assignment that makes students show their understanding of the topic and how it relates to them. Will you take the challenge?

References

AI Now. 2017. https://ainowinstitute.org/AI_Now_2017_Report.pdf p 28.

Be My Eyes. https://www.bemyeyes.com/ The app provides an image-to-text generator.

Bengio, Yoshua. Public Lecture at Amnesty International, Lon- don, UK, Beyond the Hype: How we can make AI work for Humanity? January 31, 2019.

Buolamwini, J. (2017, MIT master's thesis) Gender Shades: Intersectional Phenotypic and Demographic Evaluation of Face Datasets and Gender Classifiers

Crawford, Kate. Atlas of AI (2021). *AI Ethics* **2**, 247–248 (2022).

Encyclopedia Britannica. https://www.britannica.com/technology/ artificial-intelligence/Alan-Turing-and-the-beginning-of-AI

Forbes. March 26, 2023. https://www.forbes.com/sites/mattnovak/2023/03/26/that-viral-image-of-pope-francis- wearing-a-white-puffer-coat-is-totallyfake/?sh=7bc9ecff1c6c

Gates, Bill. The Bill Gates Blog. "The Age of AI has begun: Artificial intelligence is as revolutionary as mobile phones and the Internet." https://www.gatesnotes.com/The-Age-of- AI-Has-Begun. Accessed April 24, 2023.

Murashima, Claire. "What will AI mean for the popular app Be My Eyes?" NPR. April 4, 2023. https:// www.npr.org/2023/04/03/1167683206/why-be-my-eyes-is-a-very-popular-app-for-the-blind-or-visually-impaired

NBC Nightly News. AI Revolution Series:

- Feature on ChatGPT, AI can write an essay. December 22, 2022.
- Feature on ChatGPT, AI Chatbot and Bard. March 29, 2023.
- Feature on Be My Eyes AI. April 24, 2023.

Ofgang, Erik. "4 Ways to Use ChatGPT to Prepare for Class" Tech & Learning. https://www.techlearning.com/how-to/4- ways-to-use-chatgpt-to-prepare-for-class. April 4, 2023.

Stanford University, 'Artificial Intelligence and Life in 2030', *One Hundred Year Study on Artificial Intelligence: Report of the 2015-2016 Study Panel*, Section III: Prospects and Recommendations for Public Policy

S .Russel :Autonomous Weapon Systems: A Roadmapping. September 2019
https://unesdoc.unesco.org/ark:/48223/pf0000381137/PDF/381137eng.pdf.multi (n.d.)