The Use and Consequences of AI: An Overview

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Introduction

Artificial Intelligence (AI) is rapidly becoming ubiquitous in industry, finance, defense, and even the arts. The use of predictive algorithms in sales and supply chain management is growing. The future will include industrial production in fully-automated "lights out" factories that allow for continuous operation. In the financial sector, AI can automate risk management, fraud prevention, and other processes. It can also leverage the use of chatbots to expedite customer service. Retail banks can also take advantage of intelligent recommender systems. Image creation tools such as Midjourney and Dall-E allow users to create pictures using plain text descriptions and other parameters. The Department of Defense (DoD) uses, and is developing, AI across multiple domains, from cybersecurity, to personnel healthcare, to autonomous weapons systems. The DoD is investing billions of dollars to integrate the technology into existing systems in order to automate business tasks, predict mechanical failures, and perform complex analysis.[1,2,3,4]

AI tools have evolved rapidly to the point that some are questioning the increased reliance on them. This overreliance includes acceptance of incorrect responses from AI systems and their predictive models. Casual users may have difficulty determining how much or how often to trust online media, because they are unaware of an AI system's capabilities, limitations, and operations. Such users may presume that AI tools lack a margin of error.[5]

AI can also be used to produce targeted emails, texts, and videos to promote political causes and campaigns. Such content can bear little qualitative difference to mass mailers, phone campaigns, and television advertisements. However, there are also inherent issues with the use of deep-faked imagery, video, and audio. Sophisticated tools available at the retail and consumer levels can clone human voices and create visual media indistinguishable from the real thing. These tools can be leveraged to create misinformation and disinformation. Misinformation is incorrect information that is spread, regardless of intent to mislead. Disinformation is deliberately misleading or biased information intended to create a false impression. When distributed via social media, this content can quickly spread to targeted audiences. Threat actors can create inaccurate depictions of elected and unelected officials and current events. Although there exist programs to detect and flag AI-generated content, the sheer volume of misleading images, videos, and text is difficult, if not impossible, to fully police. A manipulative piece of artificial media need only be seen by a small subset of users to create a false and lasting impression.[6]

Consumer AI Tools

In November 2022, San Francisco-based firm OpenAI released the AI chatbot ChatGPT, which was made available to the public as a free research preview. Open-source estimates suggest that ChatGPT was the fastest-growing internet service ever, reaching 100 million users by January 2023. Utilizing OpenAI's GPT-3 large language model, which was developed in 2020 with the ability to generate human-like text, ChatGPT can respond to prompts such as questions or instructions. Furthermore, learning from human feedback, the program's dialogue format enables the chatbot to answer follow-up questions, admit errors, challenge false premises, and deny inappropriate inquiries. The current iteration of ChatGPT's knowledge base is cultivated from information available up until September 2021. Ultimately,

OpenAI's advancements have led tech giant Microsoft to invest billions of dollars in ChatGPT, as they incorporated the technology into the search engine Bing in February 2023. While the search engine runs on the same framework as ChatGPT, Bing Chat also can find information from the internet. Furthermore, in March 2023, Microsoft announced ChatGPT would be added to Microsoft 365, which will embed the "Copilot" system into Word Excel, PowerPoint, and Outlook.[7,8,9,10]

Highlighted by the rise in generative AI-related deals in the venture capital space, other chatbots have gained significant consumer interest. In Q1 of 2023, these deals totaled $1.69 billion worldwide, which was approximately a 130% increase from the previous quarter. Competitors to ChatGPT, such as Google's Bard, also have developed unique functions for their chatbots. For instance, Bard, which was launched in March 2023 as a descendant of the earlier language model "Lamda," includes a "Google it" button that enables users to fact-check and identify sources.[11,12]

Despite the benefits of AI chatbots, many experts are concerned about potential drawbacks and misuse. For instance, while ChatGPT was trained using reinforcement learning from human feedback, OpenAI states that its limitations include writing "plausible-sounding but incorrect or nonsensical answers," and sensitivity to "tweaks to the input phrasing or attempting the same prompt multiple times." Furthermore, OpenAI notes the chatbot will "sometimes respond to harmful instructions or exhibit biased behavior." In addition, in 2020, researchers at the Center on Terrorism, Extremism and Counterterrorism at the Middlebury Institute of International Studies indicated that GPT-3 had an advanced knowledge of extremist communities and could be manipulated to create polemics in the style of mass shooters, establish fake threats about Nazism, and produce rhetoric defending the QAnon conspiracy theory. Experts also fear that chatbots could be exploited by foreign agents to spread disinformation in English.[13,14]

Misinformation and Disinformation Concerns

Increasing consumer AI capabilities have also led to a rise in demand for AI image generators such as DALL-E, Midjourney, and Stable Diffusion. These tools have introduced additional concerns about misinformation and disinformation. These sites can develop artwork in a specific artist's style and illustrate events that never happened. For example, Adobe's recently released AI tool, Firefly, allows users to create images from text prompts in Photoshop. This integration of AI technology in image generators has many experts worried that AI-generated illustrations could advance to a point where humans cannot differentiate between real and artificial images.[15,16]

As AI technology has advanced, it has become significantly more difficult to identify artificial content. Regardless of intention, the potential impacts of unidentified AI content can be severe. For example, in May of this year, a lawyer utilized OpenAI's ChatGPT to research a brief. The program cited six (6) non-existent court decisions. These false citations, if not identified immediately, could have become embedded into legal documents and follow-on discourse. Recently, an AI-generated image of an explosion outside the Pentagon briefly circulated on social media before being confirmed as false. In the future, similar scenarios could trigger panic if they are not quickly identified, evaluated, and/or discredited as necessary.[17,18,19]

The creation of AI-generated content to spread disinformation is likely to increase as tools become more accessible and their outputs more realistic. AI images, videos, and audio could also impact future elections via generated media created to confuse voters, slander a candidate, or incite violence. Even the use of AI-generated media for comedic or satirical purposes can result in the spreading of misinformation or disinformation. AI-generated images and audio have already been used to present hypothetical situations and stir debate or reactions. For example, right-wing internet influencer Jack Posobiec created a video that depicted President Joe Biden announcing a draft to send American forces to Ukraine. While this was initially presented as AI content, it was shared without context, becoming misinformation by those accidentally sharing and disinformation by those deliberately misrepresenting its origins.[6,20]

Countering the spread of misinformation and disinformation is already a challenge. AI-generated content makes both even more difficult to identify. Tools to identify AI-generated writing and images already exist. These include Content at Scale, Copyleaks, Corrector App, Crossplag, GPT Zero, Illuminarty API, Kazan SEO, Originality.AI, Sapling, Truepic, and Writer. However, as AI advances, so too must detection tools. Current identification of AI content is focused on mitigation rather than elimination, as available solutions are not completely reliable.[21,22]

AI-generated content is not inherently malicious, and the vast majority of it is protected by the First Amendment. Even deliberately misleading content may fall still under the legal protections of satire or political speech. As such, monitoring and restricting it on social media is exceptionally difficult. For platforms that seek to reduce or eliminate the spread of misinformation and disinformation, a solution being explored is the addition of a digital marker or watermark on content when it is initially created by an AI tool. This method aims to stop the misrepresentation or identification of AI-generated content at the source.[22]

The Department of Defense and AI

The DoD is seeking to further promote and develop AI capabilities in national defense in order to preserve American military advantage. In June 2021, the Deputy Secretary of Defense announced the launch of the AI and Data Acceleration (ADA) Initiative. The ADA Initiative is intended to support Combatant Commands by improving data management with "Operational Data Teams" and creating a cross-component AI expert team (AIET). Through continuous experimentation, the AIET was tasked with developing interoperable AI-enabled sensor fusion, asset tasking, mission autonomy, and real-time decision advantage planning tools. Furthermore, in December 2021, the DoD announced the new position of Chief Digital and AI Office (CDAO), which became an Office of the Secretary of Defense and Principal Staff Assistant as of 01 February 2022. The CDAO integrated the Joint Artificial Intelligence Center, Defense Digital Services, the Chief Data Officer, and the enterprise platform Advana into a single entity. Achieving full operating capacity in June 2022, the CDAO was tasked with leading the DoD's strategy and policy on data, analytics, and AI adoption, advancing digital and AI-enabled solutions throughout the DoD, and offering technical experts that could address AI challenges and crises.[23,24,25]

Since reaching operational capacity, the CDAO developed a "Tradewind Solution Marketplace," created to help the DoD solicit, evaluate, and curate AI technologies and accelerate the acquisition of digital capabilities. Furthermore, in partnership with the Joint Chiefs of Staff, the CDAO relaunched Global Information Dominance Experiments in January 2023. Throughout 2023, there will be four (4) iterations of the experiment aligned to the Joint Warfighting Concept and the Joint All-Domain Command and Control Implementation Strategy. The experiments were developed to identify data-sharing barriers due to policy, security, connectivity, or other areas, as well as highlight how AI can improve joint workflow across missions. In addition, the CDAO is also responsible for developing and accessing a DoD Responsible Artificial Intelligence (RAI) ecosystem. According to a June 2022 report prepared by the DoD Responsible AI Working Council, the AI capabilities of the CDAO and all DoD Components must align with the DoD Ethical Principles for AI. These tenants include RAI governance, warfighter trust, AI product and acquisition lifecycle, requirements validation, responsible AI ecosystem, and AI workforce.[26,27,28]

Congress also has promoted DoD AI development and use in the 2023 National Defense Authorization Act (NDAA), signed in December 2022. The NDAA mandated that the defense secretary establish data repositories involving the development of AI and technology. Section 1554 of the Act advises the U.S. Cyber Command director, DoD Chief Information Officer, Undersecretary for Research and Engineering, heads of the Defense Advanced Research Projects Agency and National Security Agency, and the CDAO to work with the Defense Intelligence Agency director to develop a thorough assessment regarding the threat posed by adversaries' use of AI. The section mandates that the DoD collaborate to create a five-year plan to adapt and acquire AI systems, applications, and data management processes for the Cyberspace Operations Forces.[29]

As the DoD works to develop additional AI capabilities, the U.S. military is currently engaging in operational experiments in the field. The Navy's Task Force 59 is deploying a fleet of unmanned surface vessels that utilize AI with primary functions such as computer vision, anomalous behavior detection, multi-system command and control, and edge intelligence. The technology enables drones, which are monitoring waters surrounding the Middle East, to interpret objects, establish patterns through data and images, and maneuver without human direction.[29,30]

The DoD has also invested in AI-driven readiness improvements, such as the Defense Innovation Unit's Rapid Assessment of Threat Exposure project (RATE). The project uses an algorithm trained with hospital data from COVID-19 cases. Furthermore, RATE's algorithm can use biometric data from wearable technology. Ultimately, given that the 2023 NDAA authorized additional funding for development of AI technology, more AI-capable weapons and systems could become operational in the coming years.[31]

Conclusion

The ascendance of AI technologies represents a foundational change for the U.S. and its allies. Efforts to slow or stop its development are unrealistic. AI-powered chatbots have the potential to accelerate research, perform routine and business-critical tasks, and translate text between languages. However, their output has limitations and can include errors. They can also be intentionally misused. Chatbots like ChatGPT and Bard can write fake news stories based on user prompts. DALL-E, Midjourney, and Stable Diffusion can generate realistic images with the same level of effort. While some AI-generated content is clearly satirical, in other cases it is designed to give an inaccurate impression to a subset of users, who may share or otherwise perpetuate false stories, images, and video clips. Identifying this content and preventing the spread of misinformation and disinformation are fraught with technical, ethical, and legal issues. Some content will be protected by the First Amendment as creative or political expression. The proper response will be an ongoing challenge for both social media platforms and legacy media outlets.

There are ample uses for AI by the DoD as well as in other industries, especially where predictive models can be an asset. The DoD has demonstrated its commitment to the use of AI tools with the launch of the ADA Initiative and similar programs designed to promote American military advantage. The DoD is continuing to solicit, evaluate, and curate AI technologies and accelerate the acquisition of digital capabilities. Congress also has promoted AI development and use in the 2023 NDAA.

AI and associated technologies will continue to rapidly proliferate in the coming years. This proliferation will bring a number of benefits, as well as a variety of challenges. It will remain incumbent upon not only the DoD and its personnel, but elected and unelected officials, the private sector, and everyday internet users to recognize the seismic shift that the technology represents. RMC's Intelligence & Analysis Division will continue to monitor AI-related developments pertaining to current and prospective clients, with a focus on threat actor use of AI.

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