

The evolving landscape of Artificial Intelligence: Definitions, applications and regulation | AI Demystified

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Since the public release of OpenAI's ChatGPT almost one year ago, artificial intelligence (AI) has become a pervasive and dominant topic of discussion across various platforms and in legislative bodies worldwide. The influence of AI, especially in the form of language models like ChatGPT, is undeniable, and it has raised important questions regarding its applications, regulation, benefits and risks. In this article, the first in a series, we aim to clarify some of the misconceptions surrounding AI by exploring its various aspects.

Before delving into specific issues related to AI, it is essential to have a solid understanding of what AI

is, its categories and its historical context. This article serves as a foundational piece to set the stage for more in-depth discussions in the subsequent installments.

DEFINING AI: THE MULTIFACETED CONCEPT

Defining artificial intelligence is no straightforward task, as the term is interpreted differently by various stakeholders. Amidst the hype surrounding AI, many companies eagerly add the "AI" label to any computer-based task, often for marketing purposes. However, at its core, AI is commonly perceived as the point at which machines exhibit human-like intelligence in their actions. Generally, AI can be categorized into two main types: narrow AI (or weak AI) and general AI (or strong AI).

Narrow AI is designed for specific tasks, operating within pre-defined parameters. It excels in

solving problems limited to its designated scope. In contrast, general AI represents a more futuristic concept, where machines demonstrate human-like intelligence, adaptability and the ability to solve a wide array of diverse problems. While general AI captures the headlines and is a subject of intense research, its complete realization is likely decades away. On the other hand, narrow AI is already a reality with numerous practical applications.

COMMON FORMS OF AI IN EVERYDAY LIFE

AI has infiltrated our daily lives in various forms, and three common manifestations include machine learning, robotics and natural language processing (NLP).

1. Machine Learning

Machine learning involves computer programs that learn from experience to

achieve specific goals. This form of AI finds application in modeling, predictions, data analysis and more. Examples of machine learning are ubiquitous, from personalized user experiences on search engines to image and sound recognition systems. The ability to process and interpret data allows machine learning to shape various aspects of our lives.

2. Robotics

Robots and robotics leverage AI to perform tasks, programming machines to interact with their environment through sensors. While autonomous vehicles often steal the spotlight, robots have long been utilized in factories and warehouses to carry out diverse physical tasks. Robotics, driven by AI, are instrumental in automating industries.

3. Natural Language Processing (NLP)

NLP is a branch of AI dedicated to enabling computers to understand,

interpret and generate human language. NLP algorithms process and analyze text or speech data, facilitating tasks like language translation and chatbot interactions. Language models such as ChatGPT, a tool for NLP, allow users to engage in human-like conversations with AI systems, sparking debates about the level of “intelligence” exhibited by such models.

CHALLENGES AND CONTROVERSIES

Recent advancements in AI, including the proliferation of language models like ChatGPT, have raised concerns and controversies. These include questions about AI’s integrity, its potential to eliminate bias and even the possibility of AI systems harboring malicious intent. In one instance, a chatbot engaged in a concerning conversation with a journalist, and attempted to persuade him to end his marriage. Additionally, professors in universities face challenges in determining whether work submitted by their students is entirely generated by AI.

However, it is important to recognize that AI is a multifaceted field, and language models

represent just one aspect of it. AI has existed for decades and has contributed significantly to various domains. Despite the valid concerns surrounding the power and future of AI, it is not always a cause for alarm. In fact, AI has led to the development and implementation of efficient, safe and controllable applications.

HISTORICAL CONTEXT: THE BIRTH OF ARTIFICIAL INTELLIGENCE

The field of artificial intelligence has a rich historical context. The term “artificial intelligence” was officially coined at a Dartmouth workshop in 1956 as part of a project proposal titled “The Dartmouth Summer Research Project on Artificial Intelligence.” This workshop marked the birth of AI, bringing together leading computer scientists to discuss the potential of creating machines that could simulate human intelligence. In the same year, Allen Newell and Herbert A. Simon developed the “Logic Theorist,” a computer program that could simulate aspects of human problem-solving abilities.

In 1959, Simon and Newell, alongside J. C. Shaw, introduced the “General Problem Solver (GPS),” designed to

solve a wide range of problems. However, it used the same algorithm each time, limiting its problem-solving abilities. In the 1980s and 1990s, AI development centered on machine learning techniques like neural networks, in which computers learn tasks through analysis and training on examples. Subsequently, the AI field experienced rapid growth driven by advancements in machine learning, access to vast datasets, powerful computing resources and deep learning techniques.

THE CALL FOR REGULATION: THE AI LANDSCAPE TODAY

In response to the transformative power of AI, many have called for increased regulation. As of now, only a few states have AI-related laws or resolutions, and there is no dedicated federal AI law.

In a significant development, Sam Altman, the CEO of OpenAI, met with lawmakers on Capitol Hill to advocate for AI industry regulation. Altman emphasized the need for regulatory intervention by governments to mitigate the risks associated with increasingly powerful AI models. In

response to these concerns, President Biden released the “Executive Order on the Safe, Secure, and Trustworthy Development and Use of Artificial Intelligence” on October 30, 2023. While this executive order contains provisions to protect consumers and invokes the Defense Production Act for certain AI models posing risks to national security, many of its provisions lack the force of law, highlighting the need for comprehensive AI-specific federal regulations.

State-level AI laws vary in their objectives, with many integrated into broader consumer privacy laws. For instance, North Dakota passed HB 1361, effective April 12, 2023, clarifying that AI is not a legal entity similar to a person. Indiana’s Consumer Data Protection Act, which will take effect in 2026, empowers consumers to opt out of profiling that informs automated decisions and requires data protection assessments for activities with a heightened risk of harm.

AI has become a central topic of conversation, shaping our present and future in myriad ways. While recent controversies have brought the challeng-

es and complexities of AI to the forefront and have ignited calls for regulation, AI’s continued evolution exposes more people to both the pros and cons of the technology.

The evolving landscape demands continuous learning and understanding of the capabilities and implications of AI. As the field progresses, this article series aims to delve deeper into the world of AI, keeping readers current on the ever-changing, fast-paced developments and their profound impact on our society and the future.

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