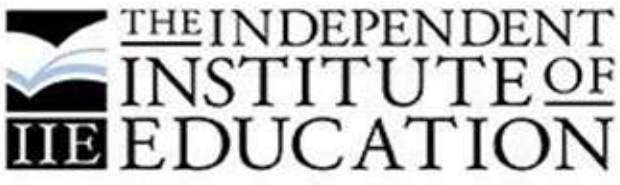

Bachelor Honours in Computer and Information Sciences

at The Independent Institute of Education

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Activity 1.1.1

Comprehensive Definition of Artificial Intelligence

Artificial Intelligence (AI) can be understood as the design and development of computational systems that demonstrate the ability to perceive, reason, learn, adapt, and act either autonomously or in collaboration with humans in ways that resemble or extend human intelligence. Earlier perspectives defined AI narrowly as machines that mimic human thinking (Turing, 1950), but modern approaches extend this understanding to include technologies such as machine learning, deep learning, natural language processing, reinforcement learning, and generative AI (Russell and Norvig, 2020). In this integrated definition, AI is not only about replicating human cognitive processes, but also about enhancing decision-making and performing tasks that surpass human cognitive and physical capacity (IBM Research, 2024).

Addressing Shortcomings of Existing Definitions

Many of the earlier definitions of AI, particularly those from the 1950s to the 1980s, focused heavily on symbolic reasoning and rule-based systems (McCarthy, 2007). While important, these approaches often neglected the adaptive nature of intelligence and the ability to learn from data. Later definitions, especially those that became prominent during the rise of machine learning in the 1990s and 2000s, placed greater emphasis on statistical learning methods, but often overlooked the ethical implications and the necessity of human oversight (Russell and Norvig, 2020). My integrated definition responds to these shortcomings by presenting AI as both an adaptive and ethically conscious system that not only mimics but also augments human capabilities. By including adaptability, ethics, and human–AI collaboration, the definition acknowledges contemporary advancements and the evolving role of AI in society (WHO, 2021).

Practical Scenario: Application of AI in Public Health

One practical example of my definition in action can be seen in the application of AI for public health and disease monitoring. A national health surveillance system powered by AI could combine machine learning algorithms with satellite-based Earth observation data, hospital records, and environmental data to detect unusual health patterns in real time (WHO, 2021). For instance, the system could identify spikes in influenza-like illnesses, predict potential outbreaks based on climate and mobility patterns, and issue early warnings to public health officials. Such a system would not only support more informed decision-making but also allow governments to allocate resources such as vaccines, medical staff, and equipment more efficiently (IBM Research, 2024). In this way, AI goes beyond automation and becomes a predictive, adaptive, and collaborative tool that strengthens the human response to public health crises.

Implications and Challenges

The use of AI in public health carries several important implications. Faster detection of diseases could save lives, reduce the burden on hospitals, and prevent local outbreaks from escalating into pandemics (WHO, 2021). It also allows for data-driven decisions that increase the efficiency and fairness of healthcare resource allocation. However, the implementation of such a system would not be without challenges. Issues of data privacy and security are significant, as sensitive patient and national health data must be safeguarded against misuse (Russell and Norvig, 2020). Bias in datasets also presents a risk, as incomplete or skewed data could result in inaccurate predictions and unequal healthcare outcomes (McCarthy, 2007). Furthermore, there is the danger of over-reliance on AI systems without proper human oversight, which could lead to harmful decisions if the technology fails or produces errors (Turing, 1950). Finally, the uneven availability of digital infrastructure, particularly in developing regions, may limit the accessibility and reliability of large-scale AI health systems (WHO, 2021).

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