Chapter 1
Introduction to Artificial Intelligence

Sewit T. Yohannes
Zayed University, UAE

Simar Mansi
Beirut Arab University, Lebanon

Sanaa Kaddoura
https://orcid.org/0000-0002-4384-4364
Zayed University, UAE

ABSTRACT

Artificial intelligence (AI) has been a topic of high interest in this day and age. AI has emerged through the early nineties and continues to grow at an unprecedented rate. The idea of having machines that are able to process certain cognition to come to a decision without the intervention of humans is the ultimate idea that is being pursued. Though the stage in which AI is able to completely outperform humans in its cognitive skills is yet to be achieved, there has been remarkable progress towards that area. This chapter aims to provide a brief introduction about AI and the area covered under the topic. Various algorithms are used in programming AI on machines such as evolutionary algorithms, genetic algorithms, and swarm intelligence. AI encompasses machine learning, which will be further discussed in this chapter. Furthermore, the impact of AI on society and futuristic predictions the chapter reviews.

INTRODUCTION

The term artificial intelligence is quite a popular term that has various impressions on various audiences around the globe. Some people see it as a great risk to develop machines that can learn and improve themselves. People directly link the idea of AI with robots and science fiction where the robots control the world and enslave humans. While on the other side people hope to have a much simpler reality where their chores and all hard work are managed by programmed intelligent machines.

The initial intention of many researchers and scientists was to have machines that can run on a certain level of intelligence to perform their activities. The definition of intelligence was one of the main controversial aspects of whether a machine can have its own intelligence or not. To replicate human intelligence the researchers tried to use children as their model as children do not know everything, to begin with, but keep learning new things as they grow (Zhang & Lu, 2021). Accordingly, even the current definition of AI is not explicitly stated. According to Dall'Anese (2020), some relate AI only to high-level machine intelligence while others consider other technologies to be a part.

Then what is artificial intelligence? AI is when a machine is made to simulate human consciousness in wholesome or particular matters. The AI advancements made until now are yet to portray an all-rounded human consciousness that responds to everything just like humans do, which is called general AI. However, there are various advancements in this technology to tackle particular events in human life by mimicking human intelligence; and this is referred to as narrow AI.

The technology has been around for some years now, though the advancement and dynamics of the field are escalating exponentially. One of the main concerns is can a programmed machine come to a state where it can think for itself and generate original work as humans do.

BACKGROUND

Artificial intelligence can be defined as the way machines are programmed to mimic the intelligence of humans to perform tasks that require humans by being independent or partially dependent. Though there were many studies and research on the topic in the previous years, intelligent machines started to be taken seriously during the 1950s starting from the Bomb, a machine, that was able to break the enigma code. While the idea of machines having the ability to think seemed ideal, the Turing test introduced by Alan Turing started proving a point. The Turing test is conducted by two individuals and a machine where one of the individuals tries to guess if he is conversing with a machine or a human. The Turing test is held every year and will be continuing until the intelligence of such a machine becomes a replica of human intelligence. Though there are no machines that completely pass this test, this was one of the tests that convinced people of the possibility of AI and how close it is to human intelligence.

Afterward, in 1955 Professor John McCarthy named the technology "the science and engineering of making intelligent machines". In the following year, 1956, he organized a research team at Dartmouth College and came up with the term Artificial Intelligence (Buchanan, 2005). In 1961 the Unimate robot became the first mechanical robot with a granted patent; it performed repetitive tasks that were performed by employees (Wallén, 2008). Then there was a major research and contribution in the area of algorithms the machines used which birthed the first chatbot named Eliza which was developed between 1964 and 1966 at MIT.

In 1966 the first electronic person was launched named Shakey stirred up predictions of super-powerful AI in the following 8 years (Wu, Liu & Wu, 2018). The robot was a general-purpose mobile robot with multiple sensors and cameras, and it was designed to make decisions after considering multiple input factors to perform a reasonable task (Wu, Liu & Wu, 2018). There was a dynamic improvement in computer vision and language processing.

While there was an increase in the attention and funding AI was receiving from various scientists, the WABOT project began in 1967 in Japan and was completed in 1972 (Liu et al., 2019). The WABOT-1

Related Content

A Multi-Agent Decision Support Architecture for Knowledge Representation and Exchange
Rahul Singh (2007). *International Journal of Intelligent Information Technologies (pp. 37-60).*
www.irma-international.org/article/multi-agent-decision-support-architecture/2413

Design, Measurements, and Analysis of Enhanced Bandwidth UWB: On-Body Antenna for Ambient Intelligence Environment
Raghvendra Singh, Kanad Ray, Preecha Yupapinand Jalil Ali (2021). *International Journal of Ambient Computing and Intelligence (pp. 140-158).*
www.irma-international.org/article/design-measurements-and-analysis-of-enhanced-bandwidth-uwb/272042

Estimation of MIMO Wireless Channels Using Artificial Neural Networks
Kandarpa Kumar Sarmaand Abhijit Mitra (2012). *Cross-Disciplinary Applications of Artificial Intelligence and Pattern Recognition: Advancing Technologies (pp. 509-543).*
www.irma-international.org/chapter/estimation-mimo-wireless-channels-using/62706

Using Contextual Information for Recognising Human Behaviour
Hans W. Guesgenand Stephen Marsland (2016). *International Journal of Ambient Computing and Intelligence (pp. 27-44).*
www.irma-international.org/article/using-contextual-information-for-recognising-human-behaviour/149273

A Scalable Algorithm for Constructing Frequent Pattern Tree
Zailani Abdullah, Tutut Herawan, A. Noraziahand Mustafa Mat Deris (2014). *International Journal of Intelligent Information Technologies (pp. 42-56).*
www.irma-international.org/article/a-scalable-algorithm-for-constructing-frequent-pattern-tree/111324