Foundations of Computer Science 2

AI

Quickly paraphrasing the Wikipedia article, artificial intelligence (AI), otherwise known as machine intelligence, is the intelligence shown by machines. AI is defined as any device that can take in it is environment and make decisions with that information to increase its chance of completing any tasks given to it.

In terms of what is and is not considered AI, there is a joke in Tesler’s Theorem saying that “AI is whatever hasn’t been done yet.” This joke references what is known as the AI effect, a phenomenon whereas machines get more and more capable of doing things, tasks that are thought to need intelligence are not considered to be AI anymore. For example, a process known as optical character recognition, the conversion of any type of physical text to machine-encoded text, is not considered to be AI anymore as the technology is used a lot. Modern AI is considered to be comprehending human speech, operating vehicles, routing for delivery and military purposes, and performing in high level strategy games.

AI has applications in many different areas. According to a journal by Thomas Davenport and Ravi Kalakota (2019), in the healthcare sector, that the most common application of traditional machine learning, or artificial intelligence, is precision medicine. Precision medicine is the prediction of what treatments are the most likely to succeed on the patient, based on different characteristics of the patient and the context.

A more complex application is the neural network. The neural network has been used in the healthcare sector for a few decades. It has been used to do things like figuring out whether a particular patient will come down with a disease or not. The neural network looks at things as inputs, outputs, the weights of variables that link inputs with outputs. The neural network has been compared to how the brain works, but the comparison is not great.

There is another, more complex use of AI in healthcare called deep learning. Deep learning is a neural network with a lot more levels of variables to predict outcomes. One of the most common uses of deep learning is identifying possibly cancerous areas in radiology photos. Another use is for radiomics, which is the finding of important features in image data that cannot be found by the human eye.

Another use for deep learning outside of the healthcare sector, mentioned in a paper by Ana Maqueda, Antonio Loquercio and more (2018) is in self-driving cars. Deep learning algorithms work well for many applications of motion estimation.

A use for AI in the military is AI-based tools to help decision making. In an article by Robert Rasch, Alexander Kott, and Kenneth D. Forbus (2003), they talk about how they had given army officers AI based tools, described as “necessarily crude but sufficiently usable”, and put them into controlled experiments. They say that the results gotten helped lift concerns about the negative impacts of the tool, and it showed the potential for saving immense amounts of time