



Artificial Intelligence

Arbeitsbericht

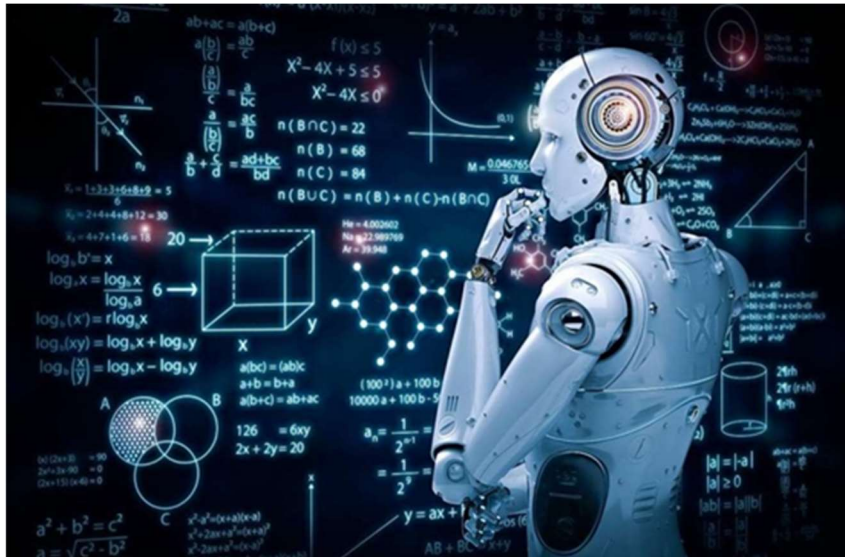
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Definition & Relevance

Alan Turing defined Artificial Intelligence as follows: "If there is a machine behind a curtain and a human is interacting with it (by whatever means, e.g. audio or via typing etc.) and if the human feels like he/she is interacting with another human, then the machine is artificially intelligent" [1]. AI does not mean building an extraordinarily intelligent machine that can solve any problem in no time, but it means to build a machine that is capable of human-like behavior. Thus, it deals with the automation of rational behavior and learning. AI combines mathematics, electrical engineering, statistics, signal processing, and communications along with computer science in pursuit of this goal. A brief history about the trends in AI can be found [here](#).

Machine Learning and Deep Learning [1]

AI is a diverse field [8,9]. Two techniques of AI are described in the following:

Machine Learning (ML): refers to a computer program that can learn to produce a behavior that is not explicitly programmed by the author of the program. This behavior is learned based on three factors: (1) Data (2) Error metrics (3) A feedback mechanism. Various types of machines learning can be read [here](#).

Deep Learning (DL): It is a part of ML and based on neural networks. The concept of neural networks or artificial neural networks (ANNs) is to replicate the processing methodology of the human brain which is composed of connected network of neurons.

AI Categories [2, 3]

Weak/Narrow AI: The kind of AI we meet in everyday life. It means that a machine is not "really intelligent" or does not have an autonomous consciousness. It is often focused on performing a single task extremely well such as watching, listening, speaking etc. examples include voice-assistants like Siri or Alexa [4].

Strong/Artificial General Intelligence:

The kind of AI we see in the movies, like the robots from West World or Data from Star Trek. A strong AI no longer acts only reactively, but also on its own initiative, intelligently and flexibly. Such strong AI is still fantasy and will probably remain so for decades or centuries to come.

Applications of AI:

Examples	AI Algorithms
Alpha go [5]	Monte Carlo Tree Search, Residual CNNs – DL
To filter Spam E-mail [10]	Naïve bayes - ML
Traffic Speed Prediction [11], Google translate [12]	RNN - DL
Grouping Similar Amazon Reviews [13]	K-means clustering - ML

Conclusion [6, 7]

In research and development, AI promises a revolution: systems capable of learning should, for example, be able to detect hidden regularities or find unconventional solutions to problems that would escape a human being [5]. AI is likely to be introduced into all areas of industry, as it has become a serious alternative to many traditional approaches. Companies and institutions are going to take advantage of the enormous possibilities and potentials of this technology and use it profitably. A lot of visionaries like Stephen Hawking, Steve Wozniak, Elon Musk, and others have warned that AI could be dangerous. One must bear in mind that these warnings almost always refer to the vague concept of strong AI. Until such a technology becomes available, we would be better served by not worrying too much about a theoretical thread and apply weak AI to our current problems. Mr. Sundar Pichai, the current CEO of Google and Alphabet once said that everything at Google is going to be AI centered.

References

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Further Information

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Ihr Ansprechpartner



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