RESEARCH PAPER

TITLE: Artificial Intelligence and Machine Learning

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1. ARTIFICIAL INTELLIGENCE

It was Join McCarthy who had coined the term of AI in 1956. The author had defined the term AI as follows – It is an integrated form of science as well as engineering for making devices intelligent for human welfare.

As per the researcher (Russell et al.), AI is an intellect that is much smarter than the best human brain in every field proactively incorporating linguistic logic and computer science. In the case of machines, it is an advanced method that does muscle work as well as represents complex questions in an intellectual manner. Another significant aspect that is concerned is as follows – Sociology, Neuron Science, Biology, Linguistics, Mathematics, Computer Science, Philosophy, etc. Here are more lists wherein AI plays a significant role is as follows – (a) providing advice to users. (b) demonstrating (c) learning (d) Exhibiting intelligent behavior.

If I talk about AGI (Artificial General Intelligence), it is a system that describes that the machine may do intellectual behavior as the humans may do several processes at a time. Broadly, AI is the combination of problem solving, perception, learning, or opting for new solutions to the system. Besides, it incorporates reasoning as well as logic. AI is of types as follows – (a) Weak AI (b) Strong AI.

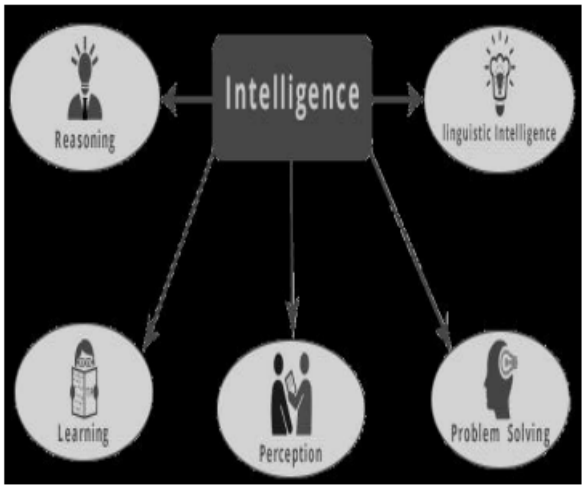

Figure 1: Diagram of sectors in AI

1.1. Weak AI

The basic principle of this aspect is that the machines behave as if they are intelligent. Besides, it also proves that virtual abilities (for instance – moving, talking, or thinking, etc) may be done by the machine if they are programmed in that manner. For example – the computer may play as well as move players automatically in the chess game. Using machine programming, one may add thinking ability to the system, so that system always takes the right step.

1.2. Strong AI

The basic principle of strong AO is that the machines do calculations and then themselves and later predict the answer in the future. For instance – WATSON was invented by IBM which is an AI supercomputer. Therefore, there will be surely such machines in the future or humanoid that will do their work as well as think more powerful than human beings.

Machine Learning:

There are three main types of machine learning algorithms: supervised learning, unsupervised learning and reinforcement learning.

Supervised learning: uses training data and feedback from humans to learn the relationship of given inputs to a given output (for example how the inputs "date" and "sales" predict customers preferences). Use it if you know already how to classify the input data and the type of behaviour you want to predict, but you want to do it on new data.

Unsupervised learning: explores input data without being given an explicit output variable (for example explores customer sales data to identify patterns and classify them). Use it when you want to classify the data, but you're unsure how to label the data yourself or you want to discover hidden patterns.

Reinforcement learning ;learns to perform a task by trying to maximize rewards which you prescribe for its actions (for example maximize returns of an investment portfolio). Use it when you have limited training data and you cannot clearly define the end goal or you want to explore possibilities without assuming what the solution might be.

The most common framework for doing machine learning is Python as a programming language.

Experiments with machine learning models require usually access to powerful computers to 'train' algorithms. That's why the additional cost to doing AI is the cost of the cloud, when data scientists train their models. Those can range from couple hundred dollars per month to millions of dollars, depending on how heavy is the data and machine learning architecture. For most businesses the cost won't exceed couple thousands dollars per month, unless they want to heavily invest in AI capabilities and train their own models, rather than use largely use pre-trained, open source solutions.

The most common architecture for machine learning algorithms are neural networks. You can think of them at Lego blocks of different sizes and colours which you can mix together in order to build a specific construction. The basic parameter of a neural network is how many layers it has and how those layers interact with each other

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