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Artificial intelligence and its applications- A Review

Varshaa.A[1]Vinitha.V[2], Usha Nandhini.D[3], Yogeshwaran.R[4], Soundharya.B.M[5]
UG Student[1,2,3,4,5], Dept. of Electronics and Communication Engineering, SNS College Of Technology, Tamil Nadu, India

Abstract

In today's world, Artificial intelligence (AI) and machine learning (ML) systems has achieved many tasks that assumed to be computational unattainable. Artificial intelligence (AI) system has the ability to learn and make decisions of its own which allows people to improve one's performance over time. Typically AI systems is used for automation purposes which reduces human effort. This paper presents a brief survey on Artificial intelligence, its uses for the future predictions and its applications on various areas.

Keywords: Artificial intelligence (AI) and machine learning (ML) systems

1. Introduction

The artificial intelligence is an emerging technology which consists of various branches of fields from computer vision to expert systems. The common element that exists in all fields of AI is creating an ability for the machines to "think" on its own. The definitions of AI is varied by different authors depending upon their field type. Some of the definitions are :

1.The exciting new effort to make computers think, machines with mind in the full and literal sense. [11]

2.The study of mental faculties through the use of computation models.[10,11]

3.The automation of activities that we associate with human thinking, activities such as decision-making, problem solving, learning. [9]

4.The study of the computations that make it possible to perceive, reason and act.

1.1 History of AI

John MC Cathy is known as the founder of "Artificial intelligence "who introduced the term in the year 1956.The field of AI was founded initially in the Dartmouth college campus in 1956.Later the technology was available to create machine intelligence as that of human.[4]The AI lead to the human motivation by thinking and such cognitive thinking made AI to grow faster in later years. In the year 1956, the first AI program known as "**The Logic Theorist"** was written by Allen Newell, J. C Shaw and Hebert Simon.[4]

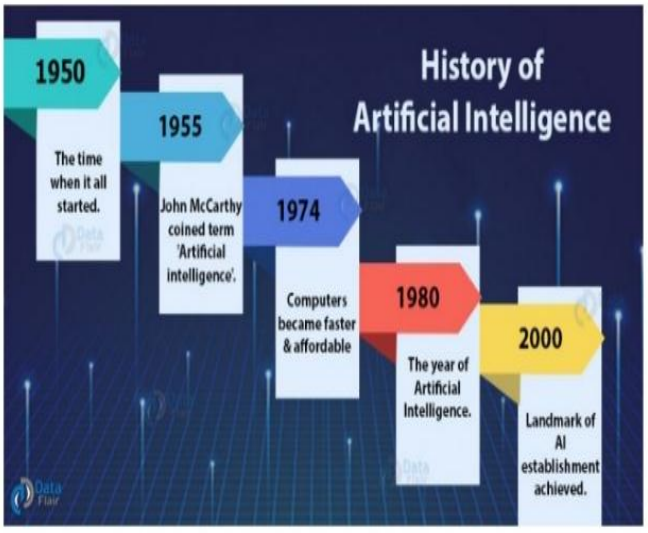

Figure (1) History of AI

1.2 Platforms of AI

Artificial intelligence is being increasingly used to create smart applications. Some of the platforms are :

- **Alaas**- Artificial intelligence as service.
- Amazon AI services.
- IBM Watson Assistant.
- Microsoft cognitive Services.
- Google AI services.

1.3 Types of AI

Artificial intelligence (AI) is categorized as either strong or weak.[1]. The weak AI is designed and trained only for performing particular tasks and hence they are also known as narrow AI. Strong AI systems is an AI system with generalized human cognitive abilities. [1] They are also known as artificial general intelligence as the system has the capability of finding out solutions for any task without any human intervention. [5]

Type 1: Reactive machines

An example of this type is Deep Blue, the IBM chess program that beat Garry Kasparov in 1990s.The Deep blue makes predictions by identifying the pieces on the chess board. It does not has memory and also cannot use the past experiences to inform future ones. Deep blue and alphaG were designed for narrow purposes and cannot easily be applied to another situation.

Type 2: Limited memory

The AI systems uses the past experiences to inform future decision. Some of the decision making functions in self driving cars are designed this way but the observations made cannot be stored permanently.

Type 3: Theory of mind

This terms refers to the understanding that others have their own beliefs, desires and the intentions that impact to the decisions that are made. But this kind of AI does not exist.

Type 4: Self awareness

The AI systems have the sense of self and consciousness. Machines with self awareness understand the current state and use the information to infer others are feelings. But this type of AI does not exists.

2.1 Disciplines of AI

AI is broadly categorized into different branches which ranges from computer vision to expert systems. They are

1.Natural Language Processing (NLP)
2.Pattern Recognition (PR)
3.Machine Learning (ML)

1.Natural Language Processing (NLP)

The Natural language processing (NLP) is a method in which the human language is converted into the machine readable and understandable form. Speech recognition is the technique that uses the NLP which includes tasks like text translation.

2.Pattern Recognition (PR)

The pattern recognition is the ability to detect the characteristics of data that provide the information. Example of this concept is to determine if the email is spam or not, the pattern recognition is used.

3.Machine learning (ML)

The machine learning deals with construction of algorithms in making an machine to learn and make decisions of its own.

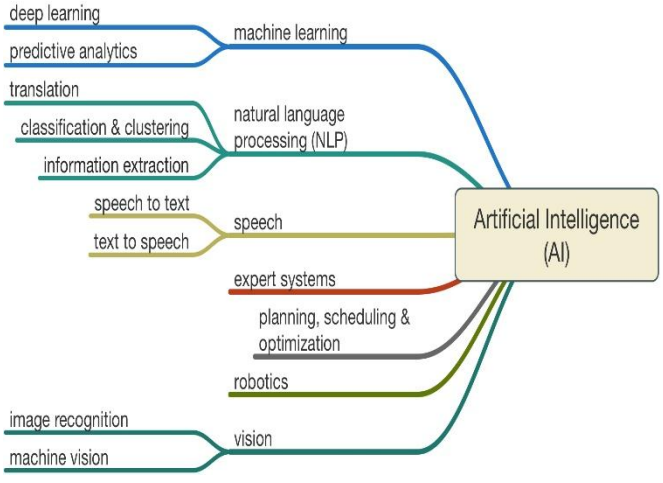

Figure (2) Machine Learning

2.2 Applications of AI

There is a wide range of applications where the AI is used in various different fields. They are classified as

1 . Military applications

2. Medicinal applications

3. Telecommunication applications

4. Industrial applications

1.Miltary Applications

AI is almost used in every military application which further increased the research in developing new and advanced applications in military sector.[8] The robots were designed for these military purposes which was operated either by remote control or these robots work autonomously designed for the military application. Also it uses applications like computer vision, data mining techniques for providing cyber security, surveillance, target recognition[6,7]. The lethal autonomous weapons systems (**LAWS)** are the military robots that work autonomously as they are programmed with descriptions. It targets the enemy by first identifying the potential of enemy based on the sophisticated algorithms.

Figure (3) Autonomous weapons

2. Medicinal applications

The primary aim of AI in health care is to analyze the relationship of prevention or treatment techniques to the patients outcomes. It can synthesize the electronic health record (EHR) data to make predictions of the patients health. [2]

3. Telecommunication applications

In Telecommunication field, the AI can be used for automation purposes.[3].It improves the network efficiency thereby providing good quality of Service. [9]

4. Industrial applications

Artificial intelligence in industries offers a tremendous support for the industries by making the production more reliable and flexible.

Conclusion

In future, the robots will be used in a constructive way where they are used for performing the tasks faster and more efficient compared to human which would lead to growth on population of robots. Hence AI techniques are used to build the intelligent robots where it would be used in every industry.

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