A Survey on Artificial Intelligence

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***Abstract*: Artificial Intelligence (AI) is the branch of computer science concerned with the study and creation of computer of computer system are more intelligence than human. Artificial Intelligence programmed by the human beings. We can increase the AI's capabilities by the supervised and unsupervised teaching. Artificial Intelligence works with pattern matching method which attempts to describe objects, events or process in terms of their qualitative features, logical and computational relationship. AI can also be used to make predications in future. Artificial Intelligence helps people to make their tasks easily and efficiently. Intelligence is the way of thinking and acting upon the environment, this might depend upon the by the programming. There is huge difference on the Natural Intelligence (NI), Machine Intelligence (MI) and Artificial Intelligence. There is wide range of application for that ranges from computer vision to expert system.**

***Keywords*: AI, IQ, MI, Learning, Automation**

1. Introduction

Artificial intelligence is based on disciplines such as Computer Science, Psychology, Linguistics, Mathematics, and Engineering. It consists of the different fields, from machine vision to expert systems. It accomplished by studying how human brain thinks, and how humans learn, decide, and work while trying to solve a problem, and then using the outcomes of this study as on the basis of developing intelligent software and systems. Artificial Intelligence helps in the development of computer functions associated with human intelligence, such as reasoning, learning, and problem solving. Some of the definitions are:

1. Computer science focusing on creating machines that can engage in human behaviours of intelligence is called "Artificial Intelligence" [1].
2. Artificial intelligence is study of mental faculties through use of computational models (Charniak and McDermott, 1985) [1].
3. Artificial Intelligence (AI) is study of intelligent agents that act on environment [1].
4. The ability of a computer to think itself is called Artificial Intelligence.

2. History of AI

In [2] Dartmouth Conference, John MC Carthy is regarded as the father of Artificial Intelligence in 1956. The AI can be traced back to ancient Egypt, but with the development of the electronic computer in 1941, the technology finally became available to create machine intelligence like human intelligence. AI is the biological motivation of human brain. The cognitive thinking and natural language made AI to grow faster. The first ever AI program known as "The Logic Theorist" was written by Allen Newell, J.C. Shaw and Herbert Simon in 1956 [2].

3. Various disciplines in AI

AI in computer science [1], it contains many sub disciplines or branches which deal in specific about the subject. These disciplines are ranges from machine vision to expert systems. They are:

A. Natural Language Processing (NLP)
B. Pattern Recognition (PR)
C. Machine Learning (ML)
D. Artificial Neural Networks (ANN)

A. *Natural Language Processing (NLP)*

It studies the problem inherent in the processing and manipulation of natural language and natural language understanding devoted to making computer "understand" statements written in human language. For example, Speech Recognition in smart phones can understand human language and process the information as per our requirement [3]-[5].

B. *Pattern Recognition (PR)*

PR is the phenomenon of classifying particular data into different classes based on their specific attributes. It is an area of machine learning. For example, there are two different classes A and B. Assume a new data point X, and now it has to be classified whether it belongs to class A or class B that is based on attributes of data point X. The following diagram illustrates about pattern recognition [6].

C. *Machine Learning (ML)*

It deals with study, analysis and construction of algorithms to make a machine to learn for making decisions on its own. ML algorithms use input as past data i.e.., specifically called as training data [7]. For example, making an autonomous car that can take directions on its own using past data.

D. *Artificial Neural Networks (ANN)*

ANN is developed with the inspiration of biological neuron that is how a human brain works. It mainly contains Input layer, Hidden layer and output layer. Whereas all these layers help in thinking process. Input layer takes training data, then ANN is trained with it and now prediction can be done from the built

model [8], [9].

4. Applications of artificial intelligence

There is wide range of applications [8] where AI is used in today's world. AI can be used in various fields. They are

1. Military Applications
2. Medicinal Applications
3. Space Applications
4. Telecommunication Applications

1) Military applications

AI can be help in the development of Intelligent and Autonomous Weapons Systems, including unmanned aerial, surface and underwater vehicles, as well as military robotics and cruise missiles. The military forces of the future will use multi-agent robotic workforces for reconnaissance and surveillance, logistics and support, communications infrastructure, forward-deployed offensive operations, and as tactical decoys to conceal manoeuvre by manned assets [13].

2) Medicinal applications

This technology used in today's state-of-the-art medical robotics. It provides our best expertise to healthcare organizations, medical practitioners, small companies, and educational institutions for the better information and treatment for the human beings.

3) Space applications

In present scenario, with the help of AI our exploration of the Solar System has involved more orbiters and rovers than human astronauts. It provides better option that how to performed any task in easy way. This is because we need more 'intelligent' or autonomous robots.

4) Telecommunication applications

In telecommunication field, AI can be used for automation purposes wherever needed. It helps in communicating with each other in easy way. For example, it provides better signal strength by which we can communicate easily.

5. Advantages of AI

The advantages of AI can perform various tasks such that it may reduce the human's efforts of its working capabilities on their work. It decreases its time period, provide better output,

provides better options to solve any problem in easy way. By help of AI, Robots can do things that are more precise work than humans and can be used in medical sciences and other useful works on other fields.

6. Future of AI

In present scenario, used of AI increasing rapidly this showing that in human can used AI at large scale for their work purpose. Robots will also continue to be used in tasks were danger, repetition, cost, and precision prevents humans from performing. In future, all the technology based on the AI which provide various jobs options in different fields. It can helps solving our challenges in different and in easy way.

7. Conclusion

AI will be used anywhere in the future wherever humans are required. With this cost will be decreased. Particularly in industries currently robots are used for performing certain tasks. Robotics is an engineering field, which uses a technique to build intelligent robots for the purpose of efficiency. The research of Robotics based on AI would lead to a manufacturing of Robots that will be used in every industry.

References

[1] Stuart Russell, Peter Norvig: "Artificial Intelligence: A Modern Approach", 2nd Edition, Pearson Education, 2007.
[2] https://en.wikipedia.org/wiki/John_McCarthy_(computer_scientist)
[3] James Allen, Natural Language Understanding, 2nd Edition, 2003, Pearson Education.
[4] Multilingual Natural Language Processing Applications: From Theory To Practice-Daniel M. Bikel and Imed Zitouni, Pearson Publications.
[5] Natural Language Processing, A Paninian perspective, Akshar Bharathi,Vineet Chaitanya, Prentice –Hall of India.
[6] Pattern Recognition an Introduction, V. Susheela Devi M. Narasimha Murty, University Press. [8]. Pattern Recognition, Segrios Theodoridis, Konstantinos Koutroumbas, Fourth Edition, Elsevier
[7] Machine Learning – Tom M. Mitchell, - MGH
[8] Machine Learning: An Algorithmic Perspective, Stephen Marsland, Taylor & Francis
[9] B. Yegnanarayana" Artificial neural networks" PHI, NewDelhi.
[10] S. N. Sivanandam, S. N. Deepa, "Introduction to Neural Networks using MATLAB 6.0", Tata MCGraw- Hill publications.
[11] J. M. Zurada,"Introduction to Artificial neural systems"–Jaico publishing.
[12] S. R. Deb, "Robotics Technology and flexible automation," Tata McGraw-Hill Education., 2009.
[13] Mikell P Groover and Nicholas G. Odrey, Mitchel Weiss, Roger N Nagel, Ashish Dutta, Industrial Robotics, Technology programming and Applications, McGraw Hill, 2012.