Sarthak Tyagi, 2024, 12:3
ISSN (Online): 2348-4098
ISSN (Print): 2395-4752

International Journal of Science, Engineering and Technology

An Open Access Journal

Research Paper on Artificial Intelligence

Sarthak Tyagi
Dept. of Computer Science
Bennett University

Abstract- The mere existence of artificial Intelligence has made multiple changes throughout the world, not only in computer science but in multiple fields. This paper presents the research on applications of artificial intelligence, definition, history, growth, and future possibilities.

Keywords- Machine learning, Natural language processing, Deep learning, Artificial neural networks, Computer vision.

I. INTRODUCTION

Artificial Intelligence (AI) can be understood in simpler terms as the intelligence of machines, It is a field of research that enables machines to actually understand their environment and they make use of learning to perform specific tasks or goals.

II. ARTIFICIAL INTELLIGENCE TECHNIQUES

1. Machine Learning

Machine learning is a subset of AI that uses various methods to enable machines to learn from their own past experiences or learn from data.

Machine learning methods can be classified as:

Supervised Learning

Supervised learning is a category of machine learning that uses labelled datasets to train algorithms to predict outcomes and recognize patterns. Here the input and output pairs are provided, the algorithm learns from this relationship and applies it to new data.

Unsupervised Learning

Unsupervised learning is a type of machine learning that learns from data without human supervision. The machine models are given unlabelled data and are allowed to learn without any provided guidance or instructions.

Reinforcement Learning

Reinforcement learning (RL) is a machine learning (ML) technique that trains software to make decisions to achieve the most optimal results. It can be compared to the classic trial and error method to maximize a reward signal.

2. Natural Language Processing

Natural language processing(NLP) helps machines to understand, interpret and even generate a human language.

It combines computational linguistics, rule based modelling of human language with statistical and machine learning models to enable computers and digital devices to recognize, understand and generate text and speech. Various applications of NLP can be found in today's society such as: chatbots, voice assistants, google translate etc.

3. Computer Vision

Computer vision trains computers to interpret and understand the visual world. Using digital images from cameras and videos and deep learning models, machines can accurately identify and classify objects.

Machines capture visual images and then analyse it. the analogue to digital conversion is used to convert the image to digital data, and digital signal processing is employed to process the data, then the resulting data is given to the computer.

4. Artificial Neural Networks

An artificial neural network is based on a collection of nodes also known as artificial neurons, which loosely model the neurons in a biological brain. It is trained to recognise patterns; once trained, it can recognise those patterns in fresh data. Artificial Neural Network has an input layer, an output layer as well as hidden layers. The input layer receives data from the outside world which the neural network needs to learn about. Then this data passes through one or multiple hidden layers that transform the input data. Finally, the output layer provides an output in the form of a response of the Artificial Neural Networks to input data provided. Its multiple applications are: Medical diagnosis, Financial predictions, Personal Assistants, Social Media.

5. Deep Learning

Deep learning is a subset of machine learning that uses multi-layered neural networks to simulate the complex decision-making power of the human brain. Deep learning uses several layers of neurons between the network's inputs and outputs. The adjective "deep" refers to the use of multiple layers in the network. Deep learning models can recognize complex patterns in pictures, text, sounds, and other data to produce accurate insights and predictions.

Its modern day applications are: Virtual assistants, Image recognition, Language processing.

III. HISTORY

From 1952 to 1956, AI surfaced as a unique domain of investigation. During this period, pioneers and forward-thinkers commenced the groundwork

Year 1952: Arthur Samuel pioneered the creation of the Samuel Checkers-Playing Program, which marked the world's first self-learning program for playing games.

Year 1955: An Allen Newell and Herbert A. Simon created the "first artificial intelligence program "Which was named as "Logic Theorist". This program had proved 38 of 52 Mathematics theorems, and find new and more elegant proofs for some theorems.

Year 1956: The word "Artificial Intelligence" first adopted by American Computer scientist John McCarthy at the Dartmouth Conference. For the first time, AI coined as an academic field.

The field of AI research was founded at a workshop held on the campus of Dartmouth College, USA during the summer of 1956.

Most of the 1980s showed a period of rapid growth and interest in AI, now labelled as the "AI boom." This came from both breakthroughs in research, and additional government funding to support the researchers. Deep Learning techniques and the use of Expert System became more popular, both of which allowed computers to learn from their mistakes and make independent decisions.

IV. APPLICATIONS OF AI

1. AI in Education

AI can provide the faculty and students with course recommendations it can adapt to each student's individual learning needs and target instruction based on their strengths and weaknesses. AI can provide tutoring and support outside the classroom.

AI in Robotics

With AI we can create intelligent robots which can perform tasks with their own experiences without being pre-programmed. AI provides robots a computer vision to navigate, sense and calculate their reaction accordingly.

3. AI for Transportation

AI for transportation can help reduce the risk of road accidents and enhance safety by informing driver with real-time updates about traffic conditions and potential hazards. AI is capable of doing various travel related works such as from making travel arrangement to suggesting the hotels, flights, and best routes to the customers.

V. FUTURE OF AI

Artificial Intelligence has a bright future ahead without a doubt but it also contains a lot of difficulties. AI is predicted to grow increasingly as technology develops, revolutionising sectors like healthcare, banking, and transportation. The work market will change as a result of AI-driven automation, necessitating new positions and skills. AI will be deployed to augment both defensive and offensive cyber operations.

VI. CONCLUSION

Until now we have discussed the applications of AI, AI Techniques, History of AI, Future of AI. We can be sure that in this particular field of Computer Science there will be major developments, breakthroughs that are going to revolutionize the entire world.

REFERENCES

1. http:// www.google.co.in
2. https://www.javatpoint.com/application-of-ai
3. https://www.simplilearn.com/future-of-artificial-intelligence-article
4. https://www.geeksforgeeks.org/applications-of-ai/
5. https://en.wikipedia.org/wiki/History_of_artificial_intelligence