ARTIFICIAL INTELLIGENCE – GENERAL OUTLOOK

Hanushika Shri.K
CSE I Year
Erode Sengunthar Engineering College,
Thudupathi.
Email:hanushikashri@gmail.com.

Kowshika.J
CSE I Year
Erode Sengunthar Engineering College,
Thudupathi.
Email:kowsi1104@gmail.com.

Abstract - This paper was prepared with the view to study and understand what is artificial intelligence, studying history of artificial intelligence, various types of artificial intelligence, advantages and disadvantages of artificial intelligence, goals of artificial intelligence and application of artificial intelligence.

Keywords: **history, types, goals, application and artificial intelligence.**

I. Meaning of AI

It is a subfield of computer science that aims to build machines or computers that are just as intelligent as people.

Although it is related to the related job of utilizing computers to comprehend human intelligence, AI should not be limited to techniques that can be observed biologically.

Artificial intelligence is the study of how to programme computers to perform tasks more effectively that people now perform.

II. Definition

According to the father of Artificial Intelligence, John McCarthy, it is "The science and engineering of making intelligent machines, especially intelligent computer programs".

III. History of AI

Here's a brief timeline of the past six decades of how AI evolved from its inception.

In 1956, John McCarthy organized the first AI conference and created the phrase "artificial intelligence."

Shakey, the first all-purpose mobile robot, was created in 1969. Now, instead of just following a list of instructions, it can act with purpose.

1997 - The world champion chess player was defeated in a match by the supercomputer "Deep Blue," which was created. The development of this big computer by IBM was a significant accomplishment.

The first robotic vacuum cleaner to be a commercial success was developed in 2002.

Speech recognition, robotic process automation (RPA), a dancing robot, smart homes, and other inventions have become commonplace since 2005.

In 2020, Baidu makes the LinearFold AI algorithm available to medical, scientific, and medical teams working on a SARS-CoV-2 vaccine (COVID-19).

IV. Types of AI

AI gives a computer programme the capacity to reason and acquire knowledge independently. It is the artificial simulation of human intellect in robots that do tasks for which we would typically turn to humans. Based on their capabilities, weak, strong, and super AI are the three major types of AI.

• Weak AI - Concentrates on a single task and is limited in its abilities (common in our daily lives)

• Strong AI - Able to comprehend and pick up any intellectual task that a human can (researchers are striving to reach strong AI)

• Super AI - Exceeds human intelligence and is superior to humans at any task (still a concept)

V. Advantages & Disadvantages of Artificial Intelligence

A programme with artificial intelligence is one that is capable of learning and reasoning. Anything that involves a programme carrying out a task that we would typically believe a human would carry out qualifies as artificial intelligence. Let's start with artificial intelligence's benefits.

Advantages of Artificial Intelligence

1. Reduction in Human Error

The ability of artificial intelligence to drastically minimize errors and improve accuracy and precision is one of its main benefits. Every decision made by AI is based on data that has already been obtained and a certain set of algorithms. When properly coded, these errors can be eliminated completely.

2. Zero Risks

Another significant benefit of AI is that it allows people to avoid many dangers by delegating certain tasks to AI robots. Machines with metal bodies are resistant by nature and can survive hostile environments, making them ideal for defusing bombs, travelling to space, and exploring the deepest reaches of oceans. Additionally, they can deliver accurate work with more responsibility and durability.

3. 24x7 Availability

Numerous studies have shown that people only work productively for three to four hours each day on average. To balance their personal and professional lives, people also require breaks and vacation time. However, AI can operate continuously without rest. They can multitask with accuracy and think far more quickly than humans can. With the aid of AI algorithms, they can even do difficult repetitive tasks without difficulty.

4. Digital Assistance

Digital assistants are used by some of the most technologically advanced businesses to interact with customers, negating the need for human staff. Digital assistants are widely used by websites to deliver content that users have requested. We can have a dialogue with them about our search. Some chatbots are designed in such a way that it is challenging to distinguish between speaking with a human and a chatbot.

5. New Inventions

AI is the driving force behind several developments that will help humans solve the bulk of difficult problems in virtually every sector. For instance, recent

developments in AI-based technology have made it possible for medical professionals to identify breast cancer in a woman at an earlier stage.

6. Unbiased Decisions

Whether we like it or not, emotions are what steer human beings. AI, on the other hand, is emotionless and approaches problems in a very practical and logical way. Artificial intelligence has the enormous benefit of being impartial, allowing for more precise decision-making.

7. Perform Repetitive Jobs

As part of our regular work, we will perform numerous repetitive duties, such as proofreading documents for errors and mailing thank-you notes, among other things. Artificial intelligence may be used to effectively automate these mundane operations and even remove "boring" work from people's jobs so they may concentrate on becoming more creative.

Example: In banks, obtaining a loan frequently necessitates many document checks, which is time-consuming for the bank's owner. Using AI Cognitive Automation, the owner may speed up the document verification process to the benefit of both the clients and the owner.

8. Daily Applications

Today, the internet and mobile gadgets are absolutely necessary for our daily activities. We use several different programmes, such as Google Maps, Alexa, Siri, Cortana on Windows, OK Google, as well as other tools like snapping selfies, making calls, and reacting to emails. Using a variety of AI-based methods, we can also predict the weather for the present day and the coming days.

Example: When you were planned a trip about twenty years ago, you must have gotten directions from someone who had already been there. You only need to ask Google where Bangalore is right now. Bangalore's location and the best path between you and Bangalore will be shown on a Google map.

9. AI in Risky Situations

This is one of the key advantages of artificial intelligence. We can overcome many of the severe limitations that humans encounter by developing an AI robot that can carry out dangerous jobs on our behalf. Whether it is used for travelling to Mars, disarming a bomb, penetrating the deepest parts of the oceans, or mining for coal and oil, it may be used efficiently in every form of natural or man-made catastrophe.

Take the explosion at the Chernobyl nuclear power plant in Ukraine as an example. There were no AI-powered robots at the time that could help us lessen the impacts of radiation by managing the fire in its early stages because anyone who came close to the core would have perished in a matter of minutes.

Disadvantages of Artificial Intelligence

1. High Costs

It is an impressive achievement when a machine can mimic human intelligence. It can be very expensive and takes a lot of time and resources. AI is highly expensive because it requires the newest hardware and software to function in order to stay current and meet criteria.

2. No creativity

The inability of AI to learn to think creatively beyond the box is a significant drawback. With pre-fed data and prior experiences, AI is able to learn over time, but it is not capable of taking a novel method. The robot Quill, which can write Forbes earnings reports, is a prime example. Only information that has already been sent to the bot is contained in these reports. The fact that a bot can create an essay on its own is astounding, yet it lacks the human touch found in other Forbes pieces.

3. Unemployment

A robot is one example of artificial intelligence in use, and it is replacing jobs and raising unemployment (in a few cases). As a result, some assert that there is always a possibility of job loss as a result of chatbots and robots taking the place of people. For instance, in certain more technologically advanced countries like Japan, robots are regularly used to replace human resources in industrial enterprises. This isn't always the case, though, since it also gives people more opportunities to work and sometimes even replaces them to boost productivity.

4. Make Humans Lazy

The majority of laborious and repetitive operations are automated by AI technologies. We tend to use our brains less and less because we do not need to memorise information or solve puzzles to complete tasks. Future generations may experience issues as a result of this AI addiction.

5. No Ethics

Morality and ethics are significant human traits that can be challenging to include into an AI. Numerous people are worried that as AI develops quickly, humans will one day become completely exterminated by it. The AI singularity is this point in time.

6. Emotionless

We have been taught from a young age that neither machines nor computers have feelings. Humans work as a team, and leading a team is crucial to accomplishing objectives. There is no doubting that when working successfully, robots are superior to humans, but it is also true that human connections, the cornerstone of teams, cannot be substituted by computers.

7. No Improvement

Artificial intelligence is a technology that cannot be created by humans since it is pre-programmed with knowledge and experience. AI is good at performing the same work repeatedly, but if we want any modifications or enhancements, we must manually change the codes. AI can store a limitless amount of data, but it cannot be accessed or used in the same way as human intellect.

When asked to perform activities for which they were not designed or intended, machines typically fail or produce meaningless results, which can have substantial negative repercussions. As a result, we are unable to provide anything typical.

VI. THE MAJOR GOALS OF ARTIFICIAL INTELLIGENCE

1. Knowledge Representation and Reasoning

Knowledge representation and reasoning, or KR, is a subfield of artificial intelligence that focuses on developing and putting into use computer representations that can interpret data from the outside world in order to solve challenging problems.

KR&R specifically tries to automate different types of reasoning as one of the main objectives of AI. It entails the coding of elements, relationships between concepts, rules, or changes between sets of facts in a way that a computer system can understand.

Applications of knowledge representation and reasoning include natural-language user interfaces, which use human language as input when dealing with computers or software, and computer-aided diagnosis, which helps doctors analyse medical imaging.

2. Automated Planning and Scheduling

Automatic planning and scheduling, sometimes known as AI planning, is a subfield of artificial intelligence that deals with the automated creation of action sequences that match to strategies that can be carried out by an AI system, such as autonomous vehicles or robots.

In order to mechanize and automate the creation of a plan based on preset goals and objectives as well as a collection of potential activities, AI planning seeks to solve one of the traditional difficulties in AI research. The fact that it is one of the essential skills required to boost the autonomy and adaptability of AI systems should be noted.

Self-correcting computer programmes or software applications, robots that act as autonomous agents, automated information collection, and computer-assisted ideas are all examples of AI planning.

3. Machine Learning

Artificial intelligence (AI) is both a particular branch of study and a real-world application. It is a branch of study that examines the algorithms and statistical models that computer systems employ to successfully carry out a given task without the use of explicit instructions.

A new method of computer programming is essential to the machine learning notion. To be more precise, it entails the creation and application of computer algorithms that can process Big Data, evaluate it, and draw conclusions from the results without explicit programming.

The addition of machine learning to data mining, ongoing advancements, and task automation are all advantages. Search engine positioning, content delivery, internet advertising, autonomous driving, and intelligent assistants are just a few examples of real-world uses.

4. Natural Language Processing

Natural language processing, or NLP, is a key objective and component of artificial intelligence. It deals with the analysis and creation of natural human languages that people use to communicate with computers. In other words, NLP is the use of natural

language rather than computer language in human-computer interaction.

NLP attempts to build and implement computer systems, particularly computer programmes that can process substantial amounts of natural language input, as it is also one of the traditional issues of AI. Overcoming difficulties with speech recognition, natural language processing, and natural language production is necessary to accomplish this goal.

Natural language processing is used by intelligent assistant services like Google Now and Apple Inc.'s Siri programme, along with other branches of artificial intelligence like machine learning and knowledge.

5. Computer Vision

Computer vision is the act of gathering and comprehending visual information from still or moving digital images or real-time video in order to process it in a way that artificial intelligence (AI) systems can use to make choices.

One of the main issues in AI research, computer vision focuses on the automation and computerization of tasks that can be carried out by human vision in a natural way, as well as the creation of systems that can process, analyse, and use visual input.

One of the prominent uses of computer vision is facial recognition. Other uses include object detection, automated image editing, video tracking, and augmented and virtual reality integration.

6. Robotics

Robotics is also one of the main objectives, and as such, one of the subgroups and domains of artificial intelligence. Keep in mind that the fields of computer science, electronic engineering, mechanical engineering, and information engineering all play a role in the interdisciplinary field of robotics.

Robotics is the study of the creation, maintenance, and use of machines or robots that can mimic human behavior and perform mechanical activities in their place. Robotics that incorporates computer science and artificial intelligence (AI) provides sensory feedback and information capabilities to enable autonomous operation.

The goal of current robotics research is to introduce residential, domestic security, and military applications. At order to organize products and improve warehouse operations, online retailer Amazon has been utilizing autonomous robots in its facilities.

7. Artificial General Intelligence

Artificial general intelligence, or AGI, is the ultimate and long-term aim of artificial intelligence as a field. AGI, by definition, shows that an AI system is capable of carrying out any intellectual work that a person can.

AGI illustrates a humanized AI system with cognitive intelligence, emotional intelligence, and social intelligence, which are the three sorts of AI systems that Andreas Kaplan and Michael Heinlein described.

An artificial general intelligence (AGI) system has either self-consciousness, self-awareness, or both. This technology will show off its ability to recreate typical human-to-human interactions between machines and humans in real-world settings.

VII. AI APPLICATIONS

Some of the applications of Artificial Intelligent as implemented by AI methods include:

Heavy Industries and Space

Combining artificially intelligent expert systems with robotics and cybernetics has greatly advanced these fields. In the creation of cars, machine tools, computer chips, and nearly every other high-tech activity, a whole manufacturing process is now fully automated, managed, and maintained by a computer system. They perform risky duties, such as handling potentially harmful radioactive materials. Robotic pilots control sentient unmanned spacecraft using intricate manoeuvres. In terms of robotics research and application, Japan is the world leader.

Finance

Banks scan and examine financial data using sophisticated software programmes. Software has been developed that can forecast stock market trends and has been known to outperform humans in this area. Robots defeated people in a simulated financial trading competition in August 2001. Artificial neural network algorithms have been used by financial institutions for a long time to identify charges or claims that are unusual and flag them for further human inquiry.

Medicine

Artificial intelligence systems can be used by a medical facility to arrange patient beds, rotate the staff, and offer medical information.

Computer Science

Dynamic programming, object-oriented programming, symbolic programming, intelligent storage management systems, and many more techniques were developed as a result of research into artificial intelligence. Although developing artificial intelligence as a primary objective is still a long way off, individuals are beginning to understand the final road that might lead there.

Aviation

Expert systems are used by airlines in their aircraft to keep an eye on system health and atmospheric conditions. Once a route has been chosen for the destination, the aircraft can be placed on autopilot.

Weather Forecast

Weather forecasts are made using neural networks. A neural network learns a pattern from previously collected data and applies that understanding to forecast weather patterns.

Swarm Intelligence

This is a neural network-like method of approaching and using artificial intelligence. In spite of the fact that a bee only observes basic rules on a personal level, programmers examine how intelligence develops in natural systems like swarms of bees. In order to understand how intelligence

develops in a swarm or collection from simple principles at an individual level, scientists investigate relationships in nature such as prey-predator partnerships. By designing agent programmes that behave in a way that is similar to these natural systems, they construct intelligent systems.

Toys and games

Some of the first attempts to mass-produce rudimentary AI for education or leisure with a domestic market were made in the 1990s. In particular, Tamagotchi and Giga Pets, the Internet (basic search engine interfaces are one simple form, for example), and the first widely distributed robot, Furby, helped introduce people, especially children, to a life of dealing with various types of AI. This flourished greatly with the Digital Revolution. Aibo, a household robot dog with intelligence and autonomy, was introduced just a year later as an enhanced model. Video games have also used AI in them.

Artificial life, automated reasoning, biologically inspired computing, robotics (behavior-based, cognitive, cybernetic, developmental, epigenetic, revolutionary robotics), concept mining, data mining, hybrid intelligent systems, intelligent agents, intelligent control, and other fields are other areas in which AI methods are used.

CONCLUSION

Artificial intelligence: Is it true? Can intelligence like a human mind transcend itself and produce its own image, in other words? Will this artificial intelligence share our sense of justice and morality, as well as our hopes and secrets, even if it is created? This represents the subsequent stage in the development of intellect. A technology as revolutionary as AI is bound to inspire some worries, therefore we need to be ready for the worst.

For instance, if AI is built on learning, would computers learn that being successful and wealthy is a good thing, then wage war against powerful nations and well-known figures? We must be as ready as we can be for this new technology because there are so many things that can go wrong with a new system. But even though there is a dread of machines, they have limitless potential. If there is a success from what we teach AI, they will suggest it in the future. Similar to children, AI systems require instruction to develop kindness, manners, and intelligence. They should use wisdom if they are going to make crucial decisions.

As citizens, it is our responsibility to ensure that AI programmers maintain the status quo. To prevent mishaps in the future, we should confirm that they are performing their duties correctly. It is true that AI has not yet accomplished its ultimate goal, to sum up. Still, even a three-year-old child might outperform AI systems in several areas, including the capacity to distinguish between and recall various items, adjust to novel circumstances, comprehend and produce human languages, and others. The primary issue is that we still don't fully comprehend how the human mind functions, how we learn new things, particularly how we learn languages and accurately duplicate them.