

THE ROLE OF ARTIFICIAL INTELLIGENCE IN DIFFERENT FIELDS

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Abstract:- Artificial intelligence is the intelligence exhibited by machines or software. It is the subfield of computer science. Artificial Intelligence is becoming a popular field in computer science as it has enhanced the human life in many areas. Artificial intelligence in the last two decades has greatly improved performance of the manufacturing and service systems. Study in the area of artificial intelligence has given rise to the rapidly growing technology known as expert system. Artificial Intelligence is the combination of science and engineering of developing machines that replicate human level intelligence. It addresses the vital questions of: what information is required in any aspect of thinking; how the knowledge should be represented; and how it should be used. Human capabilities, in future, will be enhanced by intelligent machines in many areas. It focuses on the use of AI to facilitate planning, reasoning, decision making, problem solving and many more. John McCarthy, one of the founders of artificial intelligence research, once defined the field as “getting a computer to do things which, when done by people, are said to involve intelligence.” The point of the definition was that he felt perfectly comfortable about carrying on his research without first having to defend any particular philosophical view of what the word “intelligence” means. The beginnings of artificial intelligence are traced to philosophy, fiction, and imagination. Early inventions in electronics, engineering, and many other disciplines have influenced AI. Application areas of Artificial Intelligence is having a huge impact on various fields of life as expert system is widely used these days to solve the complex problems in various areas as science, engineering, business, medicine, weather forecasting. The areas employing the technology of Artificial Intelligence have seen an increase in the quality and efficiency. The research also draws attention on the various applications of AI such as in medical diagnosis, natural language processing, expert systems and robotics. The goal is to highlight the importance of AI for the present and upcoming generation.

Keywords:- Artificial Intelligence, Natural Language Processing, Expert Systems, Robotics.

Introduction:-

Artificial intelligence is playing an increasing role in the research of management science and operational research areas. Intelligence is commonly considered as the ability to collect knowledge and reason about knowledge to solve complex problems. In the near Future intelligent machines will replace human capabilities in many areas. Artificial intelligence is the study and developments of intelligent machines and software that can reason, learn, gather knowledge, communicate, manipulate and perceive the objects. John McCarthy coined the term in 1956 as branch of computer science concerned with making computers behave like humans. Major Artificial Intelligence areas are Expert Systems, Natural Language Processing, Speech Understanding, Robotics and Sensory Systems, Computer Vision and Scene Recognition, Intelligent ComputerAided Instruction, Neural Computing. From these Expert System is a rapidly growing technology which is having a huge impact on various fields of life. The various techniques applied in artificial intelligence are Neural Network, Fuzzy Logic, Evolutionary Computing, and Hybrid Artificial Intelligence.

Intelligence is the capability to perceive data, acquire or update new or existing knowledge, and to make appropriate decisions according to given situations. Artificial Intelligence, today, plays an increasingly vital role in the advancement of research in various technologies, especially robotics. Some major areas include:

- **Robotics** – deals with designing, constructing and operating of robots that makes human life easier.
- **Natural Language Processing** - to develop such computers that can communicate in human understandable language.
- **Expert systems** – to make decisions and offer advice in areas like medical diagnosis.
- **Automated reasoning** – the ability of computer system to draw new conclusions using the information stored in them.

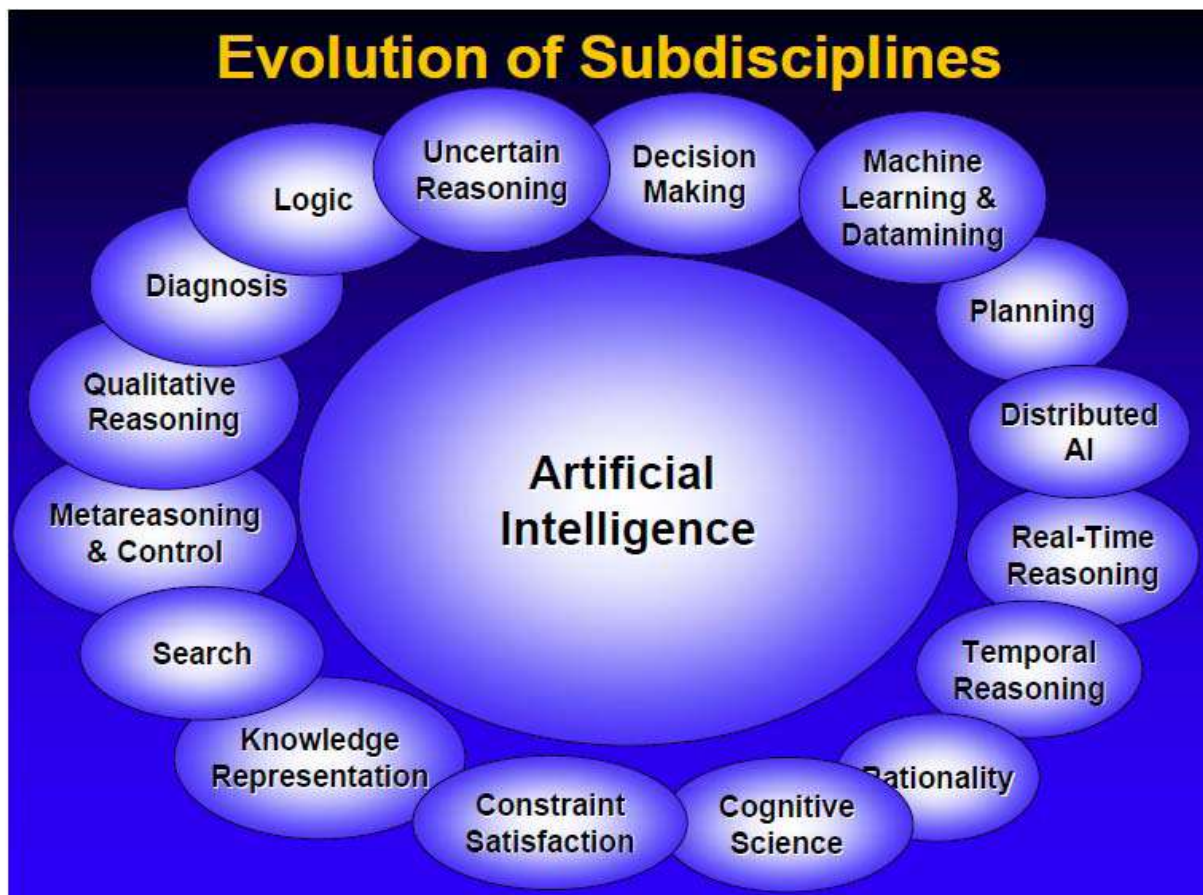
Artificial intelligence dramatically reduces or eliminates the risk to humans in many applications. Powerful artificial intelligence software helps to fully develop the high precision machine capabilities of robots, often freeing them from direct human control and vastly improving their productivity.

Development of Artificial Intelligence

The field of artificial intelligence is relatively new. When scientists and researchers began to consider the possibility of machines processing intellectual capabilities similar to those of human beings. Alan Turing, a British mathematician, first proposed a test to determine whether or not a machine is intelligent. This test later became known as the Turing Test. The term artificial intelligence “itself” was created in 1956 by a professor of Massachusetts Institute of Technology, John McCarthy. McCarthy created the term for a conference he was organizing that year. The conference, which was later called the Dartmouth Conference by AI researchers, established AI as a distinct discipline. The conference also defined the major goals of AI to understand and model the thought processes of humans and to design machines that mimic this behaviour. Much of AI research in the period between 1956 and 1966 was theoretical in nature. The very first AI program, the logic Theorist (presented at the Dartmouth Conference) was able to prove mathematical theorems. Under this conclusion

drawn depend on the data which is called knowledge base in AI. Some of most interesting areas of current AI research include expert systems, neural networks and robotics.

Evolution of Sub disciplines of Artificial Intelligence



AI in daily life

- Communications
- Time Management
- Health & safety
- Education
- Goals information needs
- Games, recreation activities
- Products, purchases, marketing
- Opportunistic Planning

AI in Science

- Automated discovery
- Design of experiments
- Triaging of resources
- Interpretation of data
- Probing complexity
- Biology, Chemistry, medicine, climate

AI and Infrastructure

- Transportation
- Commerce decision making
- Agriculture
- Engineering & architecture
- Power & conservation

AI and Consumers

- Evolving relationship with computation
- Sensing reasoning & learning
- Personalized smart applications

- Products & services
- Challenges and opportunities with data & privacy

Applications of Artificial Intelligence:

Artificial intelligence has been used in a wide range of fields including medical diagnosis, stock trading, robot control, law, remote sensing, scientific discovery and toys. Many thousands of AI “applications are deeply embedded in the infrastructure of every industry.” The late 90s and early 21st century. AI technology became widely used as elements of larger systems but the field is rarely created for these successes.

- Finance
- Hospitals and medicines
- Heavy industries
- Online and telephone customer service
- Transportation
- Telecommunication
- Toys and games
- Music
- Aviation
- News publishing & writing

Finance and AI

AI processes are much more efficient in identifying data patterns than humans which is beneficial for companies to understand their target audience and gain insight. Thousands of companies all around the world are looking at AI as the next big thing for the finance industry.

AI basically is of two types –

1. **Weak AI**
2. **Strong AI**

Weak AI, which can also be described as Narrow AI is the system which is set up only to fulfil or accomplish a particular task. It is designed in a way which can help solve specific problems. Weak AI works according to the rules that are set and is bound by it. It does not go beyond the rules set.

Strong AI, also known as full AI has much bigger prospects than the Weak AI. It is the artificial intelligence that has huge capabilities and functionality. It can broadly mimic the human brain. It is so powerful that the actions performed by the system are exactly similar to the actions and decisions of a human being. It also has the understanding power and consciousness.

Every business aims to reduce the risk conditions that surround it. This is even true for a financial institution. The loan a bank gives you is basically someone else’s money, which is why you also get paid an interest on deposits and dividends on investments. This is also why banks and financial institutions take fraud very, very seriously. AI is on top when it comes to security and fraud identification.

AI and Education

Artificial Intelligence research can make a valuable contribution to the education of human beings. An intellectual problem is solved, at least in many cases, by dividing it into pieces and developing a technique for each sub problem.

Some researchers in cognitive science and education have proposed the idea of intelligent CAI (computer assisted instruction), in which a computer would be programmed as a “tutor” that would observe the efforts of a student in solving a problem. The tutor would know about some of the mistaken ideas people can have about a particular class of problem and would notice a student falling into one of those traps. It could then offer advice tailored to the needs of that individual student. The exercise can lead to greater confidence about the ability to choose a cognitive style that suits the problem.

AI in Medical

Medical artificial intelligence (AI) mainly uses computer techniques to perform clinical diagnoses and suggest treatments. AI has the capability of detecting meaningful relationships in a data set and has been widely used in many clinical situations to diagnose, treat, and predict the results. Health care is compiling and analyzing information (like medical records and other past history), data management is the most widely used application of artificial intelligence and digital automation. Robots collect, store, re-format, and trace data to provide faster, more consistent access.

Analyzing tests, X-Rays, CT scans, data entry, and other mundane tasks can all be done faster and more accurately by robots. Cardiology and radiology are two disciplines where the amount of data to analyze can be overwhelming and time consuming. Cardiologists and radiologists in the future should only look at the most complicated cases where human supervision is useful.

Artificial intelligence systems have been created to analyze data – notes and reports from a patient’s file, external research, and clinical expertise – to help select the correct, individually customized treatment path.

Expert Systems

The first area of AI application we explore is expert systems, which are AI programs that can make decisions which normally require human level of expertise. A program called DENDRAL, developed at the Stanford Research Institute in 1965, was the grandparent of expert systems. Much like a human chemist, it could analyse information about chemical compounds to determine their molecular structure. A later program called MYCIN was developed in the mid-1970s and was capable of helping physicians in diagnosis of bacterial infections. It is often referred to as the first true expert system. The most advanced expert systems, like many other advanced technologies, are used extensively in military applications. An example is the next generation fighter plane of the U.S. Air Force -- the F-22 Raptor. The

targeting computer onboard the Raptor takes the role of a radar controller by interpreting radar signals, identifying a target, and checking its radar signature against known enemy types stored in its database.

AI in Robotics

Robotics is one field within artificial intelligence. It involves mechanical, usually computer-controlled, devices to perform tasks that require extreme precision or tedious or hazardous work by people. Traditional Robotics uses Artificial Intelligence planning techniques to program robot behaviours and works toward robots as technical devices that have to be developed and controlled by a human engineer. The Autonomous Robotics approach suggests that robots could develop and control themselves autonomously.

Advantages

- Using A.I. the chances of error are almost nil because all the operations and manipulations are done by computerised systems.
- It is very difficult for humans to perform laborious tasks and carry bulky items but, with the help of robots it becomes easy to do the same.
- Human body cannot work continuously throughout the day but, robots can function without stopping.
- Robots work faster than humans and make our daily life a lot easier.

Disadvantages

- The artificially intelligent machines are not able to act any different from what they are programmed to do.
- Cost incurred in maintenance and repair of robots is high.
- If the control of machine goes in wrong hands, it may cause destruction.
- Lateral thinking and multitasking abilities of humans may diminish.

Conclusion

The field of artificial intelligence is truly a fascinating one. Like many other new technologies, AI is changing our lives every day. It is quite possible that the near future will bring intelligent machines to make life more convenient and comfortable for all of us. AI machines do what human programmers tell them to do. There is however a need to understand AI for it is through understanding that we can make the AI technology most beneficial. AI will continue to play an increasingly important role in the various fields to enhance human effort and increasing efficiency of desired results.

References

- [1] https://en.wikipedia.org/wiki/Artificial_intelligence
- [2] https://en.wikipedia.org/wiki/Applications_of_artificial_intelligence
- [3] N.Ramesh, C Kambhampati JRT Monson , PJ Drew Artificial intelligence in medicine “2004
- [4] W. Patterson “an introduction to Artificial intelligence and expert system.”
- [5] Nilsson , Nils J Principles of artificial intelligence
- [6] Elaine Rich , Kevin Knight 1991 “artificial intelligence”
- [7] *This paper was presented at National Seminar Titled “Emerging Trends in Information Technology and its influence in various sectors” held at SD College, Hoshiarpur on 27th Aug, 2018