

# Artificial Intelligence : A Path to Innovation

Rajneesh Kumar

Assistant Librarian, Central Library, IET, Bhaddal, Ropar, Punjab, India

## ABSTRACT

In the future, intelligent machines will replace or enhance human capabilities in many areas. Artificial intelligence is the intelligence exhibited by machines or software. It is the subfield of computer science. Artificial Intelligence is becoming very popular in every field. The purpose of this article is to provide relevant information on the utilisation of artificial intelligent technology and various concepts such as expert system, natural language processing, pattern recognition and robotics and their need, application as well as advantages.

**Keywords :** Artificial intelligence, Areas of artificial intelligence, Robotics, Expert system, Automatic programming.

## I. INTRODUCTION

Artificial intelligence has two main applications in information retrieval: organization of application methods, and the design of classification methods. There is no shared terminology between the fields, making it difficult for the two areas to collaborate initially. Artificial intelligence and information retrieval continue to expand there will still need to be an increase in the cognitive ability of the users to discern what has been retrieved from the original search. The other concern for users was the anticipation that in order to use the system, a user would need to be experts to get the desired results. At the time of the article, there was a growing interest in the ability of these retrieval systems to answer questions and retrieve facts, both items we see have come to fruition today in modern search engines used

every day. Artificial intelligence was seen to have both short term and long term effects on information retrieval. In the short term, it would modify the results of a current search during a query to meet the user's current needs. In the long term, it would modify the document representations to improve responses. The society is becoming increasingly centered on information handling, processing, storage and dissemination, using microelectronic based technologies, today's computers can stimulate many human capabilities such as reading, grasping, calculating, speaking, remembering, comparing numbers, drawing, making judgments, and even interactive learning.

## II. ARTIFICIAL INTELLIGENCE

Artificial Intelligence is a way of making a computer, a computer-controlled robot, or a software think intelligently, in the similar manner the intelligent humans think. AI is 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 a basis of developing intelligent software and systems. 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. It is the study of the computation that makes it possible to perceive reason and act. Artificial intelligence is different from psychology because it emphasis on computation and is different from computer science because of its emphasis on perception, reasoning and action. It makes machines smarter and more useful. It works with the help of artificial neurons (artificial neural network) and scientific theorems (if then statements and Artificial intelligence has the advantages over the natural intelligence as it is more permanent, consistent, less expensive, has the ease of duplication and dissemination, can be documented and can

perform certain tasks much faster and better than the human.

### **Need of Artificial Intelligence**

There are several reasons for using artificial intelligence;

- ✓ Artificial intelligence can be used to perform monotonous operations that are boring or uncomfortable to humans.
- ✓ AI can answer questions and solve problems much faster than the human expert.
- ✓ Due to the capabilities of computers of processing a huge number of complex operations in a guide & accurate way, AI can provide both fast and reliable answers in situation where the human experts cannot.
- ✓ Substantial savings can be achieved from using AI in libraries.
- ✓ Human get tired from physical or mental workload, AI cannot.
- ✓ Human have limited working memory and unable to process complex, large amount data.
- ✓ Techniques of AI does not forget or never make mistake in calculation.

### **Major Areas of Artificial Intelligence**

Artificial Intelligence focuses on symbolic, non-algorithmic problem solving methods. Intelligence relies on ability to manipulate symbols. Artificial Intelligence though is a young discipline, has transformed the society beyond imagination. Some of the recent computational techniques and areas that

are utilized in developing fields of Artificial Intelligence are discussed below;

**1. Computer Vision:** It is a simple task to attach a camera to a computer so that the computer can receive visual images. People generally use vision as their primary means of sensing their environment. We generally see more than we hear, feel, smell, or taste. The goal of computer vision research is to give computers this powerful facility for understanding their surroundings.

**2. Robotics:** A robot is an electro – mechanical device that can be programmed to perform manual tasks. The robotics industries association formally defines to move a Robot as a “ Programmable multi-functional manipulator designed to move material, parts, tools, or specialized devices through variable programmed motions for the performance of variety of tasks”.

Not all robotics is considered to be part of AI. A Robot that perform only the actions that it has been pre-programmed to perform is considered to be a “dumb” robot, includes some kind of sensory apparatus, such as a camera , that allows it to respond to changes in its environment , rather than just to follow instructions “mindlessly”.

**3. Expert system:** Expert means the person who had complete knowledge in particular field, ie is called as an expert. The main aim of this problem is with the help of experts, to load their tricks on to the computer

and make available those tricks to the other users. The expert can solve the problems within the time.

The goal of this problem is how to load the tricks and ideas of an expert on to the computer, till now the research will be going on.

**4. Natural Language understanding:** The main goal of this problem is we can ask the question to the computer in our mother tongue the computer can receive that particular language and the system gave the response within the same language. The effective use of a Computer has involved the use of a Programming Language of a set of Commands that we must use to Communicate with the Computer. The goal of natural language processing is to enable people and language such as English, rather than in a computer language. It can be divided into two sub fields.

**(A) Natural Language Understanding :** Which investigates methods of allowing the Computer to improve instructions given in ordinary English so that Computers can understand people more easily.

**(B) Natural Language Generation :** This aims to have Computers produce ordinary English language so that people can understand Computers more easily.

**5. Image Processing:** Where as in pattern reorganization we can catch the image of real world things with the help of Camera. The goal of Image Processing is to identify the relations between the

parts of image. It is a simple task to attach a Camera to a computer so that the computer can receive visual images. People generally use Vision as their primary means of sensing their environment. We generally see more than we here. i.e. how can we provide such perceptual facilities touch, smell, taste, listen, and eat to the AI System. The goal of Computer Vision research is to give computers this powerful facility for understanding their surroundings. Currently, one of the primary uses of Computer Vision is in the area of Robotics.

**6. Automatic Programming:** Programming is the process of telling the computer exactly what we want to do . the goal of automatic programming is to create special programs that act as intelligent “Tools” to assist programmers and expedite each phase of the programming process. The ultimate aim of automatic programming is a computer system that could develop programs by itself, in response to an in according with the specifications of the program developer.

**7. Planning and Decision Support system:** When we have a goal, either we rely on luck and providence to achieve that goal or we design and implement a plan. The realization of a complex goal may require to construction of a formal and detailed plan. Intelligent planning programs are designed to provide active assistance in the planning process and are expected to the particularly helpful to managers with decision making responsibilities.

**8. Heuristic Classification:** The term Heuristic means to Find & Discover., find the problem and discover the solution. For solving complex AI problems it's requires lots of knowledge and some represented mechanisms in form of Heuristic Search Techniques., i.e referred to known as Heuristic Classification.

**9. Theorem Proving:** Theorem proving is another application area of AI research., ie. To prove Boolean Algebra theorems as a humans we first try to prove Lemma., i.e it tell us whether the Theorem is having feasible solution or not. If the theorem having feasible solution we will try to prove it otherwise discard it., In the same way whether the AI system will react to prove Lemma before trying to attempting to prove a theorem., is the focus of this application area of research.

**10. Neural Architecture:** People or more intelligent than Computers,. But AI researchers are trying how make Computers Intelligent. Humans are better at interpreting noisy input, such as recognizing a face in a darkened room from an odd angle. Even where human may not be able to solve some problem, we generally can make a reasonable guess as to its solution. Neural architectures, because they capture knowledge in a large no. of units. Neural architectures are robust because knowledge is distributed somewhat uniformly around the network.

Neural architectures also provide a natural model for parallelism, because each neuron is an independent unit. This showdown searching the data base a

massively parallel architecture like the human brain would not suffer from this problem.

### **Future of Artificial Intelligence**

Even though, today the role of AI is confined to specific narrow tasks and they don't have adaptable intelligence that humans exhibit, the influence of AI is drastically growing. Research and Markets, a leading Market Research organization's Artificial Intelligence Market - Global Forecast to 2020" report states that "the artificial intelligence market is estimated to grow from USD 419.7 Million in 2014 to USD 5.05 Billion by 2020, at a CAGR of 53.65% from 2015 to 2020. AI holds the power to redefine the current work environment in IT enterprises especially the way Knowledge capital and people capital are deployed. As labor force adapts to the demands of a new technology revolution, it leads to economic prosperity as well. It brings in tremendous opportunities in enterprises to deploy knowledge and people towards value creation as opposed to process management. To tap this huge potential, technology companies in India and abroad have started offering Artificial Intelligence platform as a solution or as a service (AIaaS). With AI getting more mature, let us expect humans will get more empowered with self-learning machines that can create a smarter competition with the human brains and that will probably redefine the whole business ecosystem.

### **III. CONCLUSION**

As a result, we have studied future of Artificial Intelligence and practical applications that will help you to understand in better way. It's likely that the upwards trend in capabilities of AI systems will continue; that systems will eventually become capable of solving a wide range of tasks (rather than a new system having to be built for each new problem), and that the adoption of AI within many industries will continue. Evidence suggests AI is currently unable to reproduce human behaviour or surpass human thinking; it's likely to stay a complementary workforce tool for a very long time to come. However, steady gradual improvements in AI could reach a point where AI exceeds current expectations. The continued development of AI will depend on moral public opinion regarding the benefits and acceptability of it, on businesses continuing to gain competitive advantage from using it, and continued funding for research and development of it.

### **IV. REFERENCES**

- [1]. Agre, P.E. (1995). Computational research on interaction and agency. Artificial Intelligence, 72: 1-52.
- [2]. Anderson, M. and Leigh Anderson, S.L. (2007). Machine ethics: Creating an ethical intelligent agent. AI Magazine, 28(4): 15-26
- [3]. Bacchus, F. and Grove, A. (1995). Graphical models for preference and utility. In

- Uncertainty in Artificial Intelligence (UAI-95), pp. 3-10.
- [4]. Bowling, M. and Veloso, M. (2002). Multiagent learning using a variable learning rate. *Artificial Intelligence*, 136(2): 215-250.
- [5]. Campbell, M., Hoane Jr., A.J., and Hse, F.h. (2002). Deep blue. *Artificial Intelligence*, 134(1-2): 57-83.  
<http://www.sciencedirect.com/science/article/B6TYF-43PHC49-2/1/325879d3cbf078187ea49a232e421ea9>.
- [6]. Freuder, E.C. and Mackworth, A.K. (2006). Constraint satisfaction: An emerging paradigm. In P.V.B. F. Rossi and T. Walsh (Eds.), *Handbook of Constraint Programming*, pp. 13-28. Elsevier.
- [7]. Haugeland, J. (Ed.) (1997). *Mind Design II: Philosophy, Psychology, Artificial Intelligence*. MIT Press, Cambridge, MA, revised and enlarged edition.
- [8]. Jurafsky, D. and Martin, J.H. (2008). *Speech and Language Processing: An Introduction to Natural Language Processing, Computational Linguistics, and Speech Recognition*. Prentice Hall, second edition.
- [9]. Kirsh, D. (1991a). Foundations of AI: the big issues. *Artificial Intelligence*, 47: 3-30.
- [10]. Nilsson, N.J. (1971). *Problem-Solving Methods in Artificial Intelligence*. McGraw-Hill, New York.
- [11]. Pollack, M.E. (2005). Intelligent technology for an aging population: The use of ai to assist elders with cognitive impairment. *AI Magazine*, 26(2): 9-24.
- [12]. Russell, S. and Norvig, P. (2010). *Artificial Intelligence: A Modern Approach*. Series in Artificial Intelligence. Prentice-Hall, Englewood Cliffs, NJ, third edition.  
<http://aima.cs.berkeley.edu/>.
- [13]. Weiss, G. (Ed.) (1999). *Multiagent Systems: A Modern Approach to Distributed Artificial Intelligence*. MIT Press, Cambridge, MA.