

A Survey on Artificial Intelligence and its Role in Near Future

Nidhi Rai
Assistant Professor
Department of Computer
Science & Engineering
LDCITS, Soraon, Prayagraj
India

Archana Tandon
Assistant Professor
M.C.A Department
LDCITS, Soraon, Prayagraj
India

Akhilesh Kumar Singh
Assistant Professor,
Department of Computer
Science & Engineering
LDCITS, Soraon, Prayagraj
India

Abstract: AI technology has long history which is actively and constantly changing and growing. Artificial Intelligence (AI) is an emerging technology in today's world. Now and then most of the things in the world may use AI. The ability of making a machine to make decisions on its own is termed AI. This paper presents brief survey on AI and its various emerging applications along with real time examples. Intelligence is the way of thinking and acting upon the environment. This might depends on the Intelligence Quotient (IQ) of a person. The goal of this research paper is to give some guidelines to use the AI techniques that can be applied in solving problems associated with different types of problems. AI can also be used to make prediction in future. There is huge difference on Natural Intelligence (NI), Machine Intelligence (MI) and AI. There is wide range of applications for AI that ranges from computer vision to expert systems.

Keywords: AI, IQ, AP, SE, Learning, MI, NI

1. INTRODUCTION

Artificial Intelligence is a combination of computer science, physiology, and philosophy. It is concerned with the study and creation of computer system that exhibit some form of intelligence and attempts to apply such knowledge to the design of computer based systems that can understand a natural language or understanding of natural language. The term intelligence refers to the ability to acquire and apply different skills and knowledge to solve a given problem. Intelligence is integrated with various cognitive functions such as ; language, attention, planning, memory ,perception. The evaluation of intelligence is basically studied about in last ten years. We found that nearly 9 out of 10 respondents from every kind of group believe AI is transformational and that it is leading to a technological revolution.

2. HISTORY OF ARTIFICIAL INTELLIGENCE:

Born In 1950s, artificial intelligence (AI) is hardly new. In [2] Dartmouth Conference, John MC Carthy is regarded as the father of Artificial Intelligence in 1956. The evidence of 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. After suffering from an 'AI Winter' in the late 1980s, recent advances with more powerful computers, more intelligent software and vast amount of "big data" have led to breakneck advances over the last several years mostly based on the "deep learning" breakthrough in 2012. The first AI program called "**The Logic Theorist**" was written by Allen Newell, J.C.Shaw and Herbert Simon in 1956 [2]. The following diagram illustrate the complete history of AI.

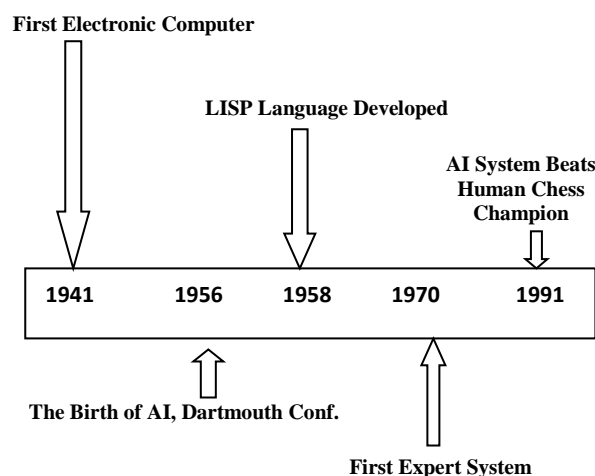


Figure 1: History of AI

3. EVOLUTION OF ARTIFICIAL INTELLIGENCE

Artificial Intelligence is already profound impact in more subtle ways. Weather forecasts, email spam filtering, Google’s search predictions and voice recognition. They developed with common technologies which are machine learning algorithm that enable them to react and respond in real time. With the growing technologies there will be grow in pains, but it will have positive effect on society in terms of efficiently is immeasurable.

3.1 REVOLUTIONARY IMPACT OF ARTIFICIAL INTELLIGENCE

Through some think of robots taking over the world when they envision artificial intelligence. There is no consequence definition of AI, but we can say it is a collection of digital tools that enable machines to perceive, learn and make decision like humans. Most of the advances so far use a sub discipline of AI known as machine learning that is based on mathematical algorithms, whose performance improves as a function of processing more data. Deep learning is type of machine learning designed to mimic neurons in the human brain.

Nearly every day brings news of additional technical breakthrough and useful AI applications. These range from more accurate medical diagnostics tools and personalized drug treatment to boosting the amount of information carried over fiber-optic telecommunication networks board uses in business including spotting fraud in expense reports improving agriculture yields, offering empirical proof that fibromyalgia is a real disease, improving education, minimizing the impact of natural disasters and even helping with methods to identify potential school shooters. AI is fundamentally different from previous technical advances. The development of AI is creating a Cognitive Era, with machines able to perform tasks beyond the capabilities of people.

4. ARTIFICIAL INTELLIGENCE LEADS IN CURRENT TECHNOLOGY SIGNIFICANCE:

Much has been said in various forums about AI being the most significant technology of present time. This survey confirmed that AI ranked top 3 of most significant technologies over the next 5-10 years.

Table 1: Technology Significance

RANKED #1-3 FOR SIGNIFICANCE	TECH EXES
Artificial Intelligence	69%
Cloud Computing	58%
Big Data/ Internet of Things	50%
Robotics	26%
Blockchain	24%
Augmented Reality	18%
Nanotechnology	17%
Virtual Reality	16%
Human /Machine Integration	11%
Ambient Computing	10%

4.1 VARIOUS ARTIFICIAL INTELLIGENCE TECHNIQUES

The various artificial intelligence techniques are listed below:

Table 2: AI Techniques

AI Technique	Purpose
Knowledge Based System	Used in the design phase of software development process.
Neural Network	Eliminates the risk associated with modules in software maintenance.
Fuzzy Logic	Reasoning the uncertainty
Genetic algorithm	Used in the software testing and generating test cases.
Case Based Reasoning (CBR)	Used to calculate time duration to complete a project.
Natural Language Processing	It helps in to improve the time duration of software development life cycle.
SBSE	Reformulating the software engineering problems as optimization problems.

Rule induction	Used to defect prediction.
Expert System	Uses the knowledge to overcome the risk management strategies during development process
Genetic code	It develop automatically generate computer program
Automated tools	Use for system redesign
Simple decision making	Dealing with uncertainty
Intelligent Agent	It generates new intelligent software system for better communication.
Simulated annealing & Tabu search	Used in the field of engineering
Probabilistic reasoning	Dealing with uncertainty

5. NEED FOR ARTIFICIAL INTELLIGENCE IN SOFTWARE ENGINEERING

The most common reasons for which AI methods, tools and techniques are applicable to SE are as follows:

- Automatic Programming (AP) in AI is synonymous with Software Engineering and this represent a new paradigm for SE in the future research.
- AI methodology and techniques can be applied to the software design process.
- It reduces the cost.
- Expert system technology efficiently provides the solution to the certain aspect of SE process and problem.
- For direct application to the SE process, AI development and maintenance environment are most suitable.
- At requirement stage error detection in coding will be isolated.
- Changes should made at requirement stage only.

6.1 ARTIFICIAL INTELLIGENCE LEARNING METHODS AND APPROACHES

Learning methods are the fundamental building blocks of artificial intelligence (AI) solutions. The situated approach in AI builds agents that are designed to behave effectively.

Table 3 : Artificial Intelligence Learning methods

S:NO	AI LEARNING METHODS
1	Failure Driven Learning
2	Learning by being Told
3	Learning by Exploration

Table 4 : Approaches of Artificial Intelligence

S:No	APPROACHES	DESCRIPTIONS
1	Classical approach	Designing the AI
2	Connectivist approach	Letting AI develop

6.2 APPLICATION OF ARTIFICIAL INTELLIGENCE

AI used in today's world in various fields. They are:

1. Space Applications
2. Medicinal Application
3. Military Application
4. Telecommunication Application
5. Industrial Application
6. Automation

6.3 ADVANTAGES OF ARTIFICIAL INTELLIGENCE

In the advantage of AI – robots can perform tasks that, we human just don't want to do or cannot able to do. Robots can able to do things that are more precise work than humans and can be used in medical sciences and others useful work.

6.4 PROBLEMS ASSOCIATED WITH ARTIFICIAL INTELLIGENCE

In the growing era of AI with the advantages of AI there are some problems are also occur, these are:

1. **Job loss problems:** As the AI becomes more smarter day by day even the high paid , high skill worker becomes more vulnerable to job losses as, given the high cost of skilled workers, the companies get better margins by automating their work.
2. **Safety Problems:** There has always been much furor about safety issues associated with AI. When expert express concern related to AI safety we should pay heed to its safety issues.
3. **Trust related problem:** As AI algorithms become more powerful by the day, it also brings several trust-related issues on its ability to make decisions that are fair and for the betterment of humankind.
4. **Computation problem:** AI algorithm involves analyzing the humongous amount of data that require an immense amount of computational power.

6.5 FUTURE PREDICTIONS FOR ARTIFICIAL INTELLIGENCE

With the introduction and successful implementation of AI solutions, many industries in the world are and will benefit from increased profitability and will still have good economic growth rates. AI opportunities will be aiming at innovative. Human centered approaches and measuring the applicability of robotic technology to various industries and companies in the same entire world. Construction of various AI systems will help the entire world to industrial sector to presuppose the available symbolic structures such as, the ability to reason and also knowledge existence.

7. CONCLUSION

Artificial Intelligence bases Its operation on accessing huge amount of information ,processing it, analyzing it and, according to its operation algorithm, executing task to solve certain problem. AI will be used anywhere in the future wherever human are required. With this cost will be decreased. AI techniques are well suited to the complex software engineering problems, because they are designed to deal with the most demanding challenges. AI based system can solve task with help of automated tools and automated programming system.

8. ACKNOWLEDGEMENT

I have taken my effort to complete this survey paper. However, without the previous research paper I could not be able to complete my work. I would like to thank all given citations in the following section that I have acquired knowledge from their paper and books. Also I would like to acknowledge that, some of the images and original definitions are directly written in this paper from the following citations.

9. REFERENCES

- [1] Stuart Russell, Peter Norvig: “Artificial Intelligence: A Modern Approach”, 2nd Edition, Pearson Education, 2007
- [2] [https://en.wikipedia.org/wiki/john_McCarthy_\(computer_science\)](https://en.wikipedia.org/wiki/john_McCarthy_(computer_science))
- [3] Jyoti tewari, Swati arya, Prem narayan singh, “Approach of Intelligence Software Agents in Future Development”, IJARCSSE, ISSN:2277128X, May 2013.
- [4] James Allen, Natural Language Understanding, 2nd Edition, 2003, Pearson Education.
- [5] J. Shabbir and T. Anwer, “A Survey of Deep Learning Techniques for Mobile Robot Application”, ArXiv e-prints, Mar. 2018.
- [6] Industrial Automation and Robotics By A.K. Gupta, S.K. Arora.
- [7] Dr. K.F. Bharti, “A Survey on Artificial Intelligence and its Applications”, IJIRCCE, ISSN:23209798, June 2017.
- [8] Jahanzaib Shabbir, and Tarique Anwer, “Artificial Intelligence and its Role in Near Future”, JLCF, Vol. 14, No. 8, August 2015.
- [9] Luger, G. 2009, Artificial Intelligence, 6th Edition, Boston, MA: Addison-Wesley.
- [10] Machine Learning: An Algorithm Perspective, Stephen Marsland, Taylor & Francis.
- [11] Machine Learning- Tom M. Mitchell, -MGH
- [12] Michael Wollowski, Robert Selkowitz, Laura E. Brown, “A Survey of Current Practice and Teaching of AI”, EAAI-16.