

## A Review of AI Research and Development

Latika & Dr Gaurav Aggarwal

### **Abstract**

*Artificial Intelligence, is the development of computer systems which can perform tasks performed by human beings like reasoning, identifying patterns, making decisions. There are various parts which are covered in artificial intelligence like expert systems, neural networks, robotics, fuzzy logic, and natural language. There are various programming languages which are used to build AI programs. Artificial Intelligence is known to reduce human efforts. This paper review's role of AI in different fields.*

*Keywords: Artificial Intelligence, Machine learning, AI ethics, Education*

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*\*Research Scholar*

*\*\*Professor, Dept. of Computer Science, Jagannath University  
Bahadurgarh, India-124507*

### **I. Introduction**

Artificial Intelligence is the branch of computer science that deals with programming or training computer systems so that they can response in the same manner as the human. This process involves reasoning, making decisions, giving expert advice, etc. AI is made up of two terms: “Artificial “which means something non -natural and “Intelligence” refers to the ability to understand and respond as per the situation. AI focuses on three skills, one is to learn, second is to give a reason i.e., reasoning, third is self-correction. All three aspects make up a system which gives higher accuracy. Machine learning is the subset of AI which focuses on programming a program which it can use for itself. Machine learning focuses on self-learning i.e., learning through own experience without any kind of human intervention. Deep Learning is sub part of Machine Learning which uses Neural Networks, In short Machine Learning is the subset of Artificial Intelligence and Deep Learning the Subset of Machine Learning.

*Overview of Artificial Intelligence:*

Artificial Intelligence involves different branches like computer science, neuron science, philosophy, Maths, Biology, etc depending upon their applications in respective fields.

### *Applications of Artificial Intelligence:*

Artificial Intelligence is widely used in almost all major sectors. AI is widely accepted as it offers solutions in less effort and time. Some major sectors are discussed in brief:

1. **Social Media:** Social Media is one of the major sectors where AI exists. Various social media platforms like X, Facebook, Instagram have large amount of data as millions of people are registered on these networks. Data is scattered but still can be used to train machines which can help in recognizing hash tags, trending reels, videos. AI gives various new business or start-ups a new approach through social media platforms through which they can increase their business reach to the intended customers as it helps in recognizing viral trends in different age groups that further help in providing best results.
2. **E-commerce Industry:** In the E commerce industry, like Amazon, Flipkart, Myntra, Nykaa, etc AI provides a very impressive interface which captures your likes, dislikes, etc and present you with list of products like clothing, electronics, Home Products, etc.
3. **Automobiles:** Like other fields, AI gives its presence in Automobiles sector as well in the form of Automated cars, providing virtual assistant in cars for giving better experience to the user.
4. **Entertainment:** In Entertainment Industry AI plays the role when platforms like Amazon Prime, Netflix, Jiocinema, Zee5, etc recommends you certain shows depending on your watched shows and events or movies.
5. **Data Security:** AI plays a vital role in Data Security as well as Cyber crimes are on a rise. More is the invention more is the risks. So here AI helps by noticing abnormalities in data access and simultaneously updating cyber security techies by providing them information relating to the risks involved by saving the valuable time in detecting the issues. As Problems are detected by AI, much time and efforts of human are saved.
6. **Robotics:** AI in robotics aimed at creating intelligent environment for better automations' it involves computer vision techniques, reinforced learning to teach robots to make human like decisions and accordingly perform tasks.
7. **Finance:** AI in finance takes insights of data analytics and measures the performance and give real time results, thereby giving better services to customers. Various AI tools like Domo, Rebank, Nanonets are widely used.
8. **Health care:** AI proves its existence in medical field by providing help in diagnose patients, drug discovery and development. Say for example, in radiology, AI is used to identify abnormalities in MRIs. AI promises to give more organized medical data using deep learning to the medical researchers to eliminate redundant methods of data analytics.

9. **Education:** AI in education field can conduct human like conversations/instructions thereby explaining difficult concepts to the students. AI has the potential to make studies interesting and can keep student engaged.
10. **Agriculture:** Agriculture is the most important sector that if taken AI can create revolutions. You can collect data on plant growth, use AI tools and produce crops with better weather conditions. AI when used in agriculture can produce Smart Farming. Smart Farming involves Machine learning, Deep Learning and time series analysis.
11. **Language Translation:** AI translation uses neural networks models to produce high quality translations. It can analysis language and help you differentiate between two words to ensure you have the right translation.
12. **Image Recognition:** You can use AI to identify written characters, human faces, objects, etc. which can reduce the risk of human error and thus increasing productivity.
13. **Government:** Ai in Government allows agencies to minimize and prevent cyber-attacks which can thus protect you from cybercrimes.

#### Goal of AI:

The Goal of AI is to read human behaviour to build intelligent machines which can work intelligently with higher accuracy and independently. The traditional goals of AI include reasoning, planning, learning, language processing, perception and support for robotics.

## II. Review of Research and Development In AI

### A. Table1: A Review of Research on AI

S No	Title	Year	Keyword	Summary
1	Artificial Intelligence in Healthcare: Past, Present and Future [1]	2017	AI, Health	The paper reviewed AI in medical care. Paper discussed two major AI devices: ML and NLP. Paper surveyed three major categories of AI application in stroke care.
2	An Overview of Artificial Intelligence Ethics [2]	2023	AI, AI ethics, ethical Issue, ethical theory, ethical principle	The article provides a comprehensive overview of AI ethics by summarizing and analysing the ethical risks and issues raised by AI. Furthermore, some challenges in the practice of AI

				ethics and some future research directions are pointed out.
3	A Comprehensive Overview of Artificial Intelligence Trends in Education [3]	2022	Artificial Intelligence, Education, Machine Learning	The Paper discuss about role of AI in Education. Areas in education industry are categorized in to educational administration, instructional design, and Learning. The AI literature is explored and new research aspects in education are discussed. Various AI education programs like “Knewton” is discussed. With AI, students can be facilitated with more resources so that they can learn new stuff.
4	Artificial Intelligence [4]	2023	AI, Principles, Machine Learning, Robotics	The paper discusses about artificial Intelligence, its role and came to a conclusion that AI role is to develop technology in an intelligent way.
5	Artificial Intelligence in Information System Research [5]	2021	Artificial Intelligence, Machine Learning, Systematic Literature Review, Research Agenda	Paper provides a systematic review of AI papers from 2005 and 2020. This Study makes three important contributions one is identification of current reported business value and contribution of AI, second is research and practical implications of AI and third is opportunities in AI for future implementation. Overall author provided a detailed description of AI present, Past and Future scope of Implementation.
6	Research Paper on Artificial Intelligence & Its Applications [6]	2023	Machine Learning, Deep Learning, neural Networks	Paper discusses about AI, its roles, its applications and achievements.

				Paper stats that AI can accomplish tasks more efficiently as compared to Humans.
7	A Review on Artificial Intelligence in Education [7]	2021	Artificial Intelligence, Education, Teaching	Paper aims at Studying AI and Its role in education. AI can improve teaching and learning process, may improve teacher teaching quality and student learning efficiency hence making learning more diversified and personalized.
8	Applications of Artificial Intelligence in Transport: An Overview [8]	2018	AI, Genetic Algorithms, Artificial Immune system	Paper presented an overview of application of AI in transport related problems. The review focussed on a number of application areas including autonomous vehicles, public transport, traffic management and control. AI can also be used to solve challenges in Transport like safety concern ,wasted fuel,etc.

The Table described above can be explained as:

1. The first paper provides information about role of AI in Medical care and overview of Medical Artificial Intelligence research. Two AI devices ML and NLP are discussed. Paper details about Deep Learning as well. Applications of AI in Stroke is Discussed. Paper came to a conclusion that A successful AI system must possess the ML component for handling structured Data and NLP component for mining unstructured texts.
2. The second paper talks about artificial Intelligence ethics. Paper provides a detailed review of ethical issues in AI. Paper beautifully categorized all the issues at different levels like social, algorithm related, long term, etc. Paper provided a detailed view of issues at every stage if AI. Paper concludes that AI ethics as a broad and multidisciplinary research area.
3. The third paper discusses AI trends in AI. Paper concludes with AI as a future to education as AI can play an important role in education.

4. The fourth paper gives a detailed description of AI. Gives overview of role of AI in different fields.
5. This paper talks about the role of AI in information system research. Paper provides a systematic literature review. Paper concludes on increasing the number of rigorous academic studies on AI.
6. This paper gives a detailed view of AI, with its applications. Paper also discusses future aspects of AI.
7. This paper is a review paper which gives a review on role of AI in education. Paper discusses about challenges and impact of AI on education. Paper concludes with the fact that AI can make both teaching and learning interesting.
8. This paper gives an overview of AI in transport. Paper discusses about transport related problems and how AI can help in solving them. Paper provides a literature review which showcases case studies that how AI is effective in designing and developing algorithms for transport hence solving various transport related issues. Key limitations of AI are also addressed in paper.

### III. Future Scope

AI is a revolution in field of Computer science, as it has become a core component of all modern software. This presents a threat but also an opportunity. There are different challenges but at the same time there is also an opportunity to explore AI algorithms and models so that they can be effectively implemented in different fields. Some future researches may include:

1. Exploring AI in different fields
2. Structuring the data
3. Using AI tools for better results
4. Using Machine Learning, Deep Learning models to achieve best results.

### IV. Conclusion

The paper represents a clear understanding of AI, its concepts and Applications, along with-it paper gives a review of research and development in the field of AI. Paper also discusses about the future opportunities which the AI offers.

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