

A Study of Applications of Artificial Intelligence

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DOI: <https://doi.org/10.51244/IJRSI.2025.12040067>

Received: 22 March 2025; Revised: 01 April 2025; Accepted: 05 April 2025; Published: 10 May 2025

ABSTRACT

It is the science and engineering of making intelligent machines, especially intelligent computer programs. It is related to the similar task of using computers to understand human intelligence, but AI does not have to confine itself to methods that are biologically observable. While no consensual definition of Artificial Intelligence (AI) exists, AI is broadly characterized as the study of computations that allow for perception, reason and action. Today, the amount of data is more so for a human it is not possible to make decision fast and in minutes so here AI plays a crucial role. AI not only helps in complex problem solving but makes our day-to-day life easier and efficient. It is broadly growing in every field. This paper examines features of artificial Intelligence, introduction, definitions of AI, history, applications, growth and achievements.

Keywords: Machine learning, deep learning, neural networks, Natural Language Processing and Knowledge Base System

INTRODUCTION

Artificial Intelligence (AI) is the study of ideas which enable computers to do the things that make people seem intelligent. The central principles of AI include such as reasoning, knowledge, planning, learning, communication, perception and the ability to move and manipulate objects. It is the science and engineering of making intelligent machines, especially intelligent computer programs. Artificial Intelligence (AI) is the field of technology that enables the machines to automatically perform tasks that would otherwise require human intelligence. AI is a huge spectrum in the field of Computer Science and is developed and programmed through machine learning and deep learning.

Machine Learning-

Machine Learning (ML), is simply the field of study that deals with teaching computer programs and algorithms to keep improving on a particular task. Machines make use of insights extracted from data. In a world where machines complete most of the tasks, they need to learn how things are done and also anticipate. This is where machine learning steps in. It teaches machines to learn on their own and make predictions based on previous insights. Machine Learning is the science of getting computers to learn and act like humans do, and improve their learning over time in an autonomous fashion, by feeding them data and information observations and real-world interactions. There are three types of machines learning supervised learning, unsupervised and reinforcement learning. Supervised learning is like teaching a child using a flash card, it is one of the easiest method. Unsupervised learning is more popular because it learns from unlabelled data and unorganized data it is used in recommendation system, to identify people habits and behaviour. Reinforcement learning is different from supervised and unsupervised because it does not learn from labelled and unlabelled data but it run from its own mistakes. It is put in a environment where he learns from good and bad behaviours. Its is used in video games

Natural Language Processing (NLP)

In simple words Natural Language Processing is a branch of artificial intelligence that gives machines the ability

to understand human text and spoken words. Think of it like this: the way you are talking to your friend today, is the same way you are interacting with a machine and it has become possible because of Natural Language Processing.

It converts the “written text” into structured data; parsing, speech recognition and part of speech tagging are a part of NLP. NLP breaks down the language into small and understandable chunks that are possible for machines to understand.

NLP can be thought of as anything that is related to words, speech, written text, or anything similar. Google, use NLP to show the desired search results. Models in NLP are usually sequential models, they process the queries and can modify each other.

Lemmatization and Stemming (this process involves converting the word into its base form), tokenization (splitting the whole text into the list of tokens), Named Entity Recognition (identification of categories and their classification) are some NLP techniques that are employed for extracting information.

Automation & Robotics

Robotic Process Automation or RPA is the use of Artificial Intelligence (AI) and Machine Learning abilities to deal with high volume, repeatable errands those earlier expected humans to perform. The fundamental objective of the RPA cycle is to supplant monotonous and exhausting clerical tasks performed by people, with a virtual labour force. Consequently, in simple words, Robotic Process Automation is the innovation that permits anybody today to arrange PC programming or a "robot" to copy and coordinate the activities of a human collaborating inside advanced frameworks to execute a business cycle.

RPA robots use the UI to catch information and control applications simply like people do. They decipher, trigger reactions and speak with different frameworks to perform on an immense assortment of redundant undertakings. Just significantly better: an RPA programming robot never dozes and commits zero errors. RPA robots are equipped for impersonating many—if not all—human client activities. They sign in to applications, move records and envelopes, reorder information, fill in structures, remove organized and semi-organized information from reports, scratch programs, and many more.

Machine Vision-

Machine vision uses cameras to capture visual information from the surrounding environment. It then processes the images using a combination of hardware and software and prepares the information for use in various applications. Machine vision technology often uses specialized optics to acquire images. This approach lets certain characteristics of the image be processed, analysed and measured. The Machine vision systems are advanced technologies designed to replicate human vision and perception in the context of automation and industrial processes. These systems integrate a combination of hardware and software components to capture and analyse visual information from the surrounding environment. The primary objective is to enable machines to make informed decisions based on the visual data they acquire.

Knowledge-Based Systems (KBS):

A KBS can be defined as a computer system capable of giving advice in a particular domain, utilizing knowledge provided by a human expert. A distinguishing feature of KBS lies in the separation behind the knowledge, which can be represented in a number of ways such as rules, frames, or cases, and the inference engine or algorithm which uses the knowledge base to arrive at a conclusion.

Neural Networks:

NNs are biologically inspired systems consisting of a massively connected network of computational “neurons,” organized in layers. By adjusting the weights of the network, NNs can be “trained” to approximate virtually any nonlinear function to a required degree of accuracy. NNs typically are provided with a set of input and output exemplars. A learning algorithm (such as back propagation) would then be used to adjust the weights in the

network so that the network would give the desired output, in a type of learning commonly called supervised learning.

Applications of AI

Artificial Intelligence has various applications in today's society. It is becoming essential for today's time because it can solve complex problems with an efficient way in multiple industries, such as Healthcare, entertainment, finance, education, etc. AI is making our daily life more comfortable and faster.

Following are some sectors which have the application of Artificial Intelligence:

AI in Banking: There are numerous applications for artificial intelligence in our banking system. It is heavily involved in ensuring the security of our transactions and detecting fraud. AI is at work behind the scenes when you deposit a cheque by scanning it with your phone, receive a low-balance alert, or log in to your online banking account. Whether you go to a shop for lunch and buy a new pair of trousers, artificial intelligence will verify the purchase to see whether it's a "regular" transaction and

Then either validate or refuse the transaction for fear that someone else is using your credit card.

AI in Finance

Document capture technologies allow financial institutions to automate their evaluation procedures of credit applicants. Cyber and data breaches are one of the primary challenges faced by banks in today's times according to KPMG. As per its survey, over half the respondents reveal that they are able to reclaim below 25% of fraud losses, making fraud prevention an indispensable task.

- * AI technologies have advanced significantly to keep track of fraudulent actions and handle system security. AI adoption in the Adopting AI for fraud detection can also boost general regulatory compliance matters, minimize the workload, and operational expenses by cutting down on being exposed to fraudulent documents.
- * American Express, for instance, adopts fraud algorithms optimized with NVIDIA Tensor RT for monitoring each transaction on their platform in real-time for over \$1.2 trillion spent annually. The platform has leveraged deep-learning-based models for detecting fraud and generating decisions within the blink of an eye.

AI in Content generation

Regularly publishing excellent content is critical for any digital marketing plan. Unfortunately, content creation takes time, and not everyone has the writing talents or willingness to produce content every week. For example, if you own a business, you may have a blog with infrequent content updates, or you may have avoided starting one entirely since you don't have the time to write.

- Writing is not easy, yet it is necessary for all businesses. Blog entries, website copy, and social media postings demand you to roll up your sleeves, brainstorm ideas, and create unique, instructive content that resonates with your target audience. Unfortunately, writer's block can strike even the most experienced digital marketers.
- An AI content generator, also known as an AI writing generator or AI writer, generates and writes various sorts of content using machine learning (ML). It may help you boost your content strategy by writing articles; social media post descriptions, adverts, blog posts, landing page text, and even emails.
- AI content generating systems scan and learn from similar topics on the internet, then generate copy using natural language processing (NLP). Essentially, they rework current information from the web to produce new content; they can assist with content generation or write full blog entries for you using the information you enter into the system as a guideline.
- AI is becoming an increasingly significant tool in the healthcare industry since it can execute many activities faster, more precisely, and efficiently at a lower cost. AI can also boost operational efficiency,

connect disparate healthcare data sets, and provide user-centric experiences.

- Healthcare providers, pharmaceutical firms, and life science companies are already using multiple types of AI, including rule-based expert systems, natural language processing (NLP), and ML, for different applications.
- AI helps medical workers better grasp the everyday patterns and demands of the patients they care for. Using AI, professionals may provide greater guidance, assistance, and feedback to patients, ensuring beneficial outcomes. Several diseases, including cancer, can be recognised more reliably in their early stages with AI.

AI in Stock Market

Stock sentiment analysis can be used to ascertain investors' attitudes towards a certain stock or asset. Sentiment can sometimes provide insight into future price action. This is also an example of how trading psychology can influence a market, serving as a forecasting tool for potential future price changes in a specific asset.

Several factors influence stock mood, including news (economic, political, and industry-related) and social media. These factors influence stock sentiment by affecting stock market volatility, trade volume, and corporate earnings.

AI in Climate Science Artificial Intelligence (AI) is a rapidly growing field that has the potential to play a significant role in addressing climate change. The capabilities of AI technology can help us better understand the complex interactions between the earth's systems, the impact of human activities on the environment, and the measures that need to be taken to mitigate the effects of climate change. In this blog, we will explore some of the ways in which AI can be used to tackle the issue of climate change and help achieve a more sustainable future.

AI in Travel & Transport

AI is becoming highly demanding for travel industries. AI is capable of doing various travel related works such as from making travel arrangement to suggesting the hotels, flights, and best routes to the customers. Travel industries are using AI-powered chatbots which can make human-like interaction with customers for better and fast response.

AI use in NETFLIX

AI is a technological advancement that has many sub-branches that specialize in different tasks. In general, AI relies on the history of algorithmic data to train itself to work efficiently and understand the needs of users. It employs tools such as NLP to provide users with a human-like interaction.

Machine learning is a sub-discipline of artificial intelligence. Machine learning is the understanding of computer algorithms that automatically improve their workings when fed data and experience. In fact, most of these technologies don't even require human intervention to complete their tasks. It is used for personalized movie selection, create personalized thumbnail, pre-production's locations for movies, provide high quality streaming.

Aims :

Objectives of the Study

- To identify the challenges pre-service teachers, face in adopting AI, such as ethical concerns, data privacy, and accessibility issues.
- To explore the benefits of AI in higher education for pre-service teachers, including enhanced teaching practices and personalized learning.
- To provide recommendations for effectively preparing future educators for AI-enhanced learning environments.

- To compare the significant difference in AI literacy with respect to age group.
- To identify the significant difference in AI literacy with respect to computer proficiency.
- To investigate the significant difference in AI literacy with respect to gender.

Hypothesis

1. There is no significant difference in AI literacy with respect to age group.
2. There is no significant difference in AI literacy with respect to computer proficiency.
3. There is no significant difference in AI literacy with respect to gender.

Scope of the Study

The study offers valuable insights into the evolving role of AI in education and highlights the importance of integrating AI literacy into teacher training programs. It provides a foundation for future research to expand on areas not covered in this study, such as the long-term impacts of AI adoption in classrooms and its influence on teaching practices over time. By focusing on pre-service teachers, the study contributes to on going discussions about preparing educators to harness AI's potential while addressing the ethical and practical challenges it presents.

The Significant of the Study

This study holds significance because it aims to support the development of future-ready educators who can confidently integrate AI into their teaching while preserving the human-cantered values that are fundamental to education. As AI continues to evolve, it is crucial to prepare teachers who can critically assess its role, adapt to new technologies, and harness its potential to improve learning outcomes. By focusing on pre-service teachers, this study seeks to shape the foundation of teaching practices in the AI era, ensuring that educators are not only technologically competent but also capable of fostering meaningful and equitable learning experiences for all students.

CONCLUSION

Till now we have discussed in brief about Artificial Intelligence. We have discussed some of its principles, its applications, its achievements etc. The ultimate goal of institutions and scientists working on AI is to solve majority of the problems or to achieve the tasks which we humans directly can't accomplish. It is for sure that development in this field of computer science will change the complete scenario of the world Now it is the responsibility of creamy layer of engineers to develop this field.

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