ARTIFICIAL INTELLIGENCE AND ITS APPLICATIONS IN VARIOUS FIELDS

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ABSTRACT

Artificial intelligence refers to the cognitive capabilities shown by computers or computer programmes. This particular field pertains to the discipline of computer science. The discipline of Artificial Intelligence (AI) is gaining momentum within the realm of computer science as a result of its notable accomplishments across several fields, consequently augmenting the overall quality of human existence. Considerable advancements have been achieved in the domain of artificial intelligence throughout the last twenty years, leading to noteworthy enhancements in operational efficiency and the effectiveness of production and service systems. The field of artificial intelligence has had a significant impact on the development of expert systems, which have seen rapid growth as a technological advancement. The many sectors of society have had a substantial influence from the application fields of Artificial Intelligence (AI). Expert systems, a prevalent kind of artificial intelligence (AI) technology, are extensively used for the resolution of intricate issues across several domains like science, engineering, business, medical, and weather prediction. The use of Artificial Intelligence technology has led to enhanced quality and productivity in several sectors. This article provides a comprehensive review of the aforementioned technology and its many application domains. This paper will additionally examine the contemporary utilisation of Artificial Intelligence (AI) technologies in various domains, including Power System Stability (PSS) design to mitigate power system oscillations resulting from interruptions, Network Intrusion for safeguarding computer and communication networks against unauthorized access, the medical field for enhancing hospital inpatient care and medical image classification, accounting databases to address associated challenges, and computer games.

Keywords: Artificial Intelligence (AI), Power System Stability (PSS), Network Intrusion, Communication, Computer, Databases, Expert Systems

INTRODUCTION

There is a proposition that artificial intelligence is increasingly gaining a prominent position within the field of management science and operational research. Intelligence is often seen as the ability to acquire knowledge and use cognitive processes to tackle complex problems. It is quite probable that in the near future, intelligent machines will replace human abilities in several sectors. The discipline of artificial intelligence involves the study and progress of intelligent machines and software that has the ability to engage in thinking, learning, knowledge acquisition, communication, manipulation, and object perception.The phrase "artificial intelligence" was introduced by John McCarthy in 1956, referring to a field within computer science that focuses on enabling computers to exhibit human-like behaviour (Haenlein& Kaplan, 2019). The focus of investigation is the analysis of computational processes that facilitate the abilities of perception, cognition, and action. Artificial intelligence (AI) differs from the discipline of psychology by prioritising computational aspects, while simultaneously setting itself apart from computer science by its specific attention on perception, reasoning, and action. The integration of this technology enhances the cognitive capabilities and practical utility of machines. The functioning of this system relies on the use of artificial neurons, which are components of an artificial neural network. Additionally, the system incorporates scientific theories, namely using if-then statements and logical reasoning (Bhosale et al., 2020). AI technologies have reached a level of maturity where they are capable of providing tangible and practical advantages across many applications. Expert Systems, Natural Language Processing, Speech Understanding, Robotics and Sensory Systems, Computer Vision and Scene Recognition, Intelligent Computer-Aided Instruction, and Neural Computing are the core subfields that fall under the umbrella of the subject of Artificial Intelligence (AI). The field of study known as Expert Systems is seeing rapid expansion and is having a substantial impact on a wide variety of aspects of modern life. Neural

Networks, Fuzzy Logic, Evolutionary Computing, and Hybrid Artificial Intelligence are some of the subfields that fall under the umbrella of artificial intelligence (Pannu, 2015).

The advantages that artificial intelligence offers over natural intelligence are many. It exhibits greater permanence and consistency, incurs lower costs, offers ease of replication and transmission, can be effectively documented, and demonstrates superior performance in specific jobs compared to human capabilities (Shukla & Vijay, 2013).

The approach of the Turing Test: Alan Turing came up with the idea for the Turing test in the year 1950.The purpose of this experiment was to ascertain whether or not a particular computer is capable of cognitive reasoning by testing it. During the course of the experiment, there will be exchanges taking place between a human interrogator and a human participant, as well as between the human interrogator and a machine participant. The purpose of the experiment is to determine which of the two participants is the human and which is the machine. When an examiner, after the presentation of written inquiry, is unable to determine whether the written response originated from a human or a machine, the computer has successfully met the requirements for passing the test (Akman & Blackburn, 2000).

Areas of Artificial Intelligence (AI)

a) ***Language Understanding:***The ability to "understand" and speak successfully in a context with naturally occurring language. Examples of translation include converting a spoken language into written form and converting one natural language into another natural language. Translation may also refer to the process of converting one natural language into another natural language.

b) ***Learning and Adaptive Systems:***The ability to adjust one's conduct based on previous experiences as well as the ability to create broad rules controlling the universe based on the basis of such experiences is referred to as the capacity for experience-based learning.

c) ***Problem Solving:***The ability to define an issue in a suitable manner, to plan for its solution, and to understand when further knowledge is necessary as well as how to get it.

d) ***Perception (visual):***The ability of a perceiving organism to assess a circumstance that has been seen by linking it to a mental model that includes the organism's "knowledge of the world." This study has led to the production of a compiled list that details the many connections that may be made between the various components of the scene.

e) ***Modeling:***The ability to develop an internal representation in addition to a set of transformation rules, both of which may be used to predict the behaviour of some collection of real-world objects or entities as well as their relationship to one another, is referred to as having the "capability to generate an internal representation."

f) ***Robots:***A combination of several or even all of the skills described above, in addition to the capacity to navigate treacherous terrain and exert influence on elements of the surrounding environment.

g) ***Games:***Accepting a formal set of rules for games such as Chess, Go, Kalah, and Checkers, etc., and translating these rules into a representation or structure that allows problem-solving and learning abilities to be utilised in achieving an appropriate level of performance.

Table 1: Different Areas of Artificial Intelligence (Pannu, 2015)

AI Area	Key Techniques	Applications
Language Understanding	NLP, Sentiment Analysis	Chatbots, Language Translation, Content Categorization
Learning and Adaptive Systems	Adaptive Learning, Content Recommendation	Personalized Education, Automated Assessment
Problem Solving	Genetic Algorithms, Simulated Annealing	Optimization, Complex Problem Solving
Perception (Visual)	Computer Vision	Autonomous Vehicles, Surveillance, Medical Imaging
Modeling	Predictive Modeling, Simulation	Weather Forecasting, Economic Analysis
Robots	Robotics, AI Integration	Healthcare, Manufacturing, Process Automation
Games	AI Behaviors, Procedural Content Generation	Enhanced Gameplay, Player Experience

Applications of Artificial Intelligence (AI)

a) ***AI and Education:***The field of Artificial Intelligence (AI) research has the potential to significantly enhance the educational experiences of individuals. In several instances, an intellectual quandary may be effectively resolved by the process of breaking it down into smaller components and devising specific methodologies to address each subproblem. The subproblems remain consistent regardless of whether the issue is being tackled by a machine or a human. If a certain methodology demonstrates its value in the context of computer systems, it may be advantageous for a human problem solver to possess knowledge of the procedures used by the computer.

Certain scholars in the fields of cognitive science and education have put forward the concept of intelligent computer-assisted instruction (CAI), whereby a computer would be designed to function as a "tutor" that monitors a student's problem-solving endeavours. The instructor has knowledge on common misconceptions that individuals may have regarding a certain category of problems, and is capable of identifying instances when a pupil may succumb to such misconceptions. Subsequently, the system has the potential to provide personalised guidance based on the specific requirements of each learner. Another educational benefit is indirectly significant but ultimately more crucial. Through intentional practise, the learner acquires the ability to replicate mechanical thinking, so enabling them to express its defining characteristics and distinguish it from other modes of thinking. Engaging in physical activity has the potential to enhance one's self-assurance in selecting a cognitive approach that aligns with the given challenge (Verma, 2018).

b) ***Expert Systems:***The first domain of artificial intelligence (AI) application that we investigate pertains to expert systems. These systems include AI programmes that possess the capability to render judgements that typically need a degree of competence comparable to that of a person. The emergence of expert systems may be traced back to the development of a programme known as DENDRAL, which was created at the Stanford Research Institute in 1965. Similar to a chemist, the system has the capability to analyse data pertaining to chemical substances in order to ascertain their molecular configuration. In the mid-1970s, a subsequent programme known as MYCIN was established with the purpose of assisting doctors in the detection of bacterial illnesses. Frequently, it is denoted as the first authentic expert system.

Expert systems are considered to be one of the most readily deployed and extensively used technologies within the field of artificial intelligence. Despite the fact that the impacts of such systems may not be immediately apparent, they have had a significant influence on our daily existence. Indeed, a considerable number of the computer programmes being used may be classified as expert systems. The spell-checking feature included into our word processor may be classified as an expert system. The function of this tool is to assume the responsibility of a proofreader, whereby it examines a set of phrases, compares them with established spelling and grammatical conventions, and provides the writer with ideas for potential adjustments (Riahi et al., 2021). The integration of

expert systems with robots has facilitated the automation of industrial processes, resulting in increased production rates and decreased mistake occurrences. In the 1950s, a conventional assembly line required the involvement of several individuals, however nowadays, a much reduced workforce of ten to twenty personnel is sufficient to oversee the operation, since it is mostly carried out by expert systems. Japanese automotive manufacturers, namely Toyota and Honda, are widely seen as the trailblazers in the field of industrial automation. These companies have achieved remarkable levels of automation, with up to 80% of their production processes being automated.

Expert systems, which are at the forefront of technological advancements, are widely used in many military contexts. One such instance is to the next iteration of the United States Air Force's fighter aircraft, namely the F-22 Raptor. The targeting system installed aboard the Raptor aircraft assumes the function of a radar controller, since it interprets radar signals, detects and identifies potential targets, and cross-references their radar signatures with known adversary types recorded in its database.

c) ***Neural Networks:***Neural networks, which incorporate the capacity for learning into computer programmes, represent an additional domain of considerable fascination. The capacity to establish correlations among pieces of information and derive logical inferences is fundamental to the process of acquiring knowledge. Human beings depend on a cognitive faculty known as common sense in order to establish and comprehend these associations. Nevertheless, the implementation of some concepts that seem intuitive to humans may pose significant challenges when translating them into computer programmes. One example of a commonly seen phenomenon is the establishment of a causal relationship (Zhang & Friedrich, 2003). The occurrence of an event may be attributed to preceding events that have a causal relationship with it. Consequently, the impact of an event is experienced by following occurrences that are organised in specific collections. In a neural network, it is necessary for every node to possess the capability of accepting many inputs, analysing them to ascertain the appropriate connections to establish, and transmitting outputs to the corresponding nodes identified in the preceding stage. In a neural network, every processing element is responsible for receiving a set of inputs and making decisions on the appropriate processing elements to which these inputs should be directed. Subsequently, the processed data is sent to the designated processing elements, mirroring the behaviour of a biological neuron.

There are many challenges within the domain of neural network research, including the development of algorithms for establishing connections, the identification of appropriate data sets to be interconnected, and the ability to discard unnecessary data as needed. Various facets of the human learning process may provide difficulties in the use of a neural network. The intricacy of these difficulties is the underlying factor that necessitates more theoretical investigation in the respective sector. Although the existing theories and technologies do not provide a comprehensive set of answers, significant progress has been made in implementing the concepts and partial solutions to the issue, resulting in notable results. Deep Blue, the chess-playing programme created by IBM, represents a limited number of instances where neural networking ideas have been used. The system demonstrated the ability to acquire knowledge from past games and make anticipatory assessments of an adversary's potential actions. As our comprehension of the human brain and the process of learning expands, our capacity to develop more efficient algorithms for learning and establishing associations between existing concepts will also increase (Segal et al., 2004)

d) ***AI in Robotics:***Robotics is a distinct domain included within the broader discipline of artificial intelligence. The process entails the use of mechanical equipment, often under computer control, to execute activities that need a high degree of accuracy or involve laborious or dangerous labour that would otherwise be performed by people. Traditional robotics use artificial intelligence planning approaches to programme the behaviours of robots, with the aim of developing and controlling these technological devices via human engineering.

The Autonomous Robotics paradigm posits that robots have the potential to achieve self-development and autonomous control. These robotic systems possess the capability to effectively adjust and respond to ambiguous and insufficient data inside dynamic and evolving surroundings. This may be achieved by emulating the cognitive development of an individual biological creature or

by using the principles of Evolutionary Robotics, whereby selective reproduction is used within communities of robots. The system facilitates the development of adaptable robots via a simulated evolution process (Vrontis et al., 2022).

Robotics is often regarded as the most appealing domain within the field of artificial intelligence technology, garnering significant attention from the general public. Indeed, the field of robotics has the potential to greatly benefit humanity via the use of artificial intelligence. The use of industrial robots, which possess the capability to do repeated tasks with precision, has already resulted in enhanced productivity within assembly lines situated in manufacturing facilities. The integration of artificial intelligence into these industrial robots has the potential to enhance their productivity by enabling them to perform a broader range of activities with increased efficiency. In the foreseeable future, it is anticipated that nano-robots, which are of a size comparable to that of a small insect, would possess the capability to penetrate the human body, undertake organ restoration procedures, and eradicate harmful bacteria and cancerous cells. Specialised robots, such as those designed for bomb defusing and space exploration, has the capability to navigate and operate in hazardous situations, hence doing activities that are considered perilous for human beings (Jain & Raheja, 2015).

The SHRDLU robot has the ability to visually perceive and arrange boxes on a flat surface, as well as provide responses to inquiries on the things present on that surface. The development of such a robot was a significant advancement, since it has the capability to see things in three dimensions and possessed rudimentary knowledge of physics, which it could use autonomously to do tasks. Nevertheless, it is important to acknowledge that the capabilities of these robots are restricted to a confined setting including a small number of stationary geometric objects, often referred to as "the micro-blocks world" by researchers (ai.about.com). The complexity of the actual world is significantly heightened due to the presence of a multitude of moving items (Laird et al., 2017).

e) In Power System Stabilizers (PSS):Since the 1960s, PSSs have been utilised to dampen electromechanical oscillations in many applications. A secondary control mechanism that is often employed as a crucial part of an excitation control system is the Power System Stabiliser (PSS). The Power System Stabiliser (PSS)'s main function is to deliver a signal to the excitation system in order to provide electrical torques that are coordinated with speed changes. The purpose of these torques is to reduce power oscillations. The excitation system of the generator is responsible for generating a component of electrical torque known as damping torque, which is directly proportional to changes in speed (Talaq, 2012). A cyber-physical system (CPSS) may be represented by a mathematical model consisting of a two-stage network. This network is characterised by similar lead-lag components and is described by three parameters: a gain factor K, and two time constants T1 and T2. The network is interconnected by a washout circuit including a time constant denoted as Tw. The signal washout block functions as a high-pass filter, characterised by the time constant Tw, which permits the passage of the signal related to the oscillations in rotor speed without alteration. Furthermore, it prevents steady state fluctuations from changing terminal voltages. The phase compensation blocks, which exhibit the requisite phase-lead characteristics to compensate for the phase delay between the input and output signals, are identified by the time constants T1i through T4i. Power system operation computer programmes are routinely run and updated in response to varied variances. The complicated non-linearities present in real systems may be efficiently handled by artificial intelligence (AI). Several methods used in optimisation issues for PSSs include Artificial Neural Networks (ANN), Fuzzy Logic (FL), and Evolutionary Strategies (ES), among others (Jiang, 2009).

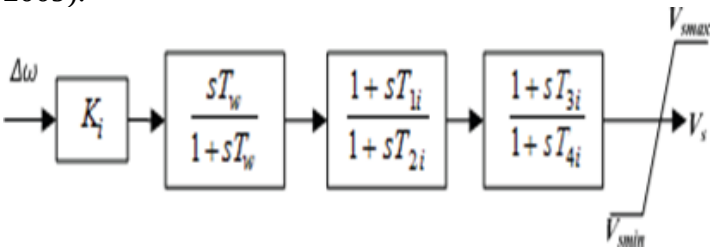

Figure 1: Structure of PSS

f) ***In Network Intrusion Detection:*** Intrusion Detection Systems (IDS) use a variety of Artificial Intelligence (AI) techniques to protect against unauthorised access and malicious attacks on computer and communication networks. The Intrusion Detection System (IDS) refers to the systematic monitoring of network events and the identification of indicators of unauthorised access or intrusion (Shone et al., 2018).

- The Use of Artificial Neural Network in Intrusion Detection Systems: An artificial neural network (ANN) is a mathematical model comprising a network of linked artificial neurons that are capable of processing information. In the field of Intelligent Data Systems (IDS), Artificial Neural Networks (ANN) are used for the purpose of representing intricate connections between input and output variables, as well as for the identification of patterns within datasets. Within the context of neural networks, a neuron performs a summation operation by multiplying the input values with their corresponding weights and then applies a threshold function. The outcome is sent to future neurons. This can be generalized as:

$$y_i = f\left(\sum_k w_{ik} x_{k+} \mu_i\right)$$

- Shah et al. (2004) suggested Artificial Neural Networks and Fuzzy Inference Systems as viable strategies for creating an Intrusion Detection System (IDS) in their research. SNORT was used to do real-time traffic analysis and packet recording on an IP network during the system's training phase. Through the use of Protocol Analysis and Neuro-Fuzzy learning techniques, a database of signature patterns was produced. The 1998 DARPA Intrusion Detection Evaluation Data and TCP dump raw data were used to conduct extensive testing and validation processes on the models. There are 24 different attack kinds in the dataset altogether. Denial of Service (DOS), Remote to User (R2L), User to Root (U2R), and Probing are the four main divisions into which the assaults may be divided. Compared to artificial neural networks, which took a few minutes to attain convergence, the fuzzy inference system had a quicker training period, according to the study's results, needing just a few seconds. In general, both approaches were determined to be beneficial, albeit the Fuzzy Inference System outperformed Artificial Neural Networks owing to its higher classification accuracy. The experiment also showed the importance of variable selection since both techniques performed worse when all variables were employed simultaneously without any selection procedure. Results were promising when a selection containing around 40% of the variables was employed.

g) ***In Medical Area:***

- The use of fuzzy expert systems in the field of medicine involves the application of fuzzy logic, a data processing approach that allows for the consideration of ambiguity. This characteristic makes fuzzy logic especially well-suited for many medical applications. The idea of fuzziness is well captured and used in a computational way. The theory is primarily applicable in the field of medical diagnostics, with a secondary use in the characterization of biological systems. Fuzzy expert systems use a framework consisting of a set of conditional statements, often referred to as "if-then" rules, to facilitate modelling (Neill, 2013).
- The Application of Evolutionary Computation in the Field of Medicine: Evolutionary computing encompasses a range of computer methodologies that emulate the natural evolutionary process, namely the principles of natural selection and survival of the fittest, to address real-world challenges. Genetic Algorithms (GAs) are the predominant kind of evolutionary computing used in medical applications. Genetic algorithms, which draw inspiration from natural biological development, are extensively used as a prevalent kind of evolutionary computing in the field of medical applications. The use of Genetic algorithms has been employed in the prediction of patient outcomes in critically unwell individuals. The use of evolutionary computing is also employed in the process of MRI segmentation of brain tumours for the purpose of assessing the effectiveness of treatment regimens. Mammographic microcalcifications have also been used in computerised analysis (Neill, 2013).

h) ***In Accounting Databases:***As a possible remedy for the issues with accounting databases, artificial intelligence is now being investigated. In the lines that follow, we list a number of issues that existing accounting database systems face.

Accounting information fails to adequately satisfy the requirements of decision makers. The comprehension and processing of computerized accounting databases by humans is limited or challenging. The usability of systems is often challenging. The emphasis is placed on quantitative data.

Whether the decision maker is involved or not, the integration of intelligent systems with accounting databases has the potential to help in the analysis of large volumes of data. In order to help users understand or interpret transactions and determine the accounting events that the system records, the systems have the power to analyse the data. Natural language knowledge may be stored and retrieved thanks to artificial intelligence. Several artificial intelligence techniques and technologies might help in the thorough understanding of the accounting system's happenings. There is a greater focus placed on the use of symbolic or textual data as opposed to only numerical data in order to capture contextual information. The integration of artificial intelligence and expert systems incorporates intelligent capabilities inside the database, hence providing assistance to users. These models assist users by effectively organising and analysing substantial volumes of data, even in the absence of direct user involvement. These models can aid decision makers who are operating under limited time restrictions by providing suggestions for alternate approaches in the process of looking for and evaluating data (Shukla & Viajy, 2013).

i) ***In Computer Games:***It's a commonly accepted practise to employ computer technology for gaming. Computer games have seen a tremendous shift over their history, moving from simple text-based forms to the more complex world of three-dimensional graphical games, which are typified by complicated and vast virtual worlds. When coupled, the incorporation of several technologies including user input, audio playback, graphics rendering, and game artificial intelligence (AI) enhances a computer game's overall quality and intended entertainment value. Artificial intelligence (AI) is a crucial component inside computer games, making them indispensable (Puri et al., 2016). The absence of AI would inevitably result in a diminished level of enjoyment during gameplay. The absence of artificial intelligence in computer games would result in a significant reduction in complexity, perhaps leading to a decline in player engagement and interest in these games. The absence of game artificial intelligence would significantly reduce the level of difficulty in achieving victory. Artificial intelligence (AI) is used for the purpose of addressing prevalent challenges inside computer games and furnishing enhanced functionalities to those games. The investigation of non-playing character (NPC) pathfinding, decision-making, and learning processes is the main goal of this work. Modern computer games are significantly improved by artificial intelligence (AI) in a number of ways. Unit movement, simulated perception, scenario analysis, spatial reasoning, learning, group coordination, resource allocation, steering, flocking, target selection, and several more noteworthy features are among the notable features. The usage of animation and music that depend on contextual elements is an example of artificial intelligence in action (Al Ghatrifi et al., 2023).

- Solutions to Computer Game Issues with Artificial Intelligence (AI) Implementation: Artificial intelligence addresses three prevalent challenges in the realm of non-playing character (NPC) functionality, including NPC mobility, NPC decision-making, and NPC learning. The use of four distinct artificial intelligence approaches, namely route Finding, Bayesian Networks, Fuzzy Logic, and Genetic Algorithms, facilitates the provision of non-playing character route finding, decision making, and learning capabilities inside a computer game.

Ethical and Moral Issues in AI

Currently, we find ourselves situated in a future era, when we are seeing a remarkable period of technological advancement. This era may be described as a golden age, characterised by an abundance of technological innovations, and it shows no signs of reaching its culmination or encountering any discernible boundaries.

The moral and ethical ramifications of artificial intelligence are readily apparent, and the discourse around this topic may be categorized into three distinct perspectives. One perspective is that given the existing prevalence of poverty and unemployment, there seems to be little or no justification for the development of autonomous mechanical labourers. Furthermore, it is imperative that we refrain from developing robots capable of engaging in argumentation with humans about such matters. An alternative perspective posits that the progression and utilisation of societal resources need the assistance of robots capable of exhibiting a certain degree of autonomous cognitive abilities. Party number three exhibits a lack of concern towards the situation, which is a common characteristic seen in human civilization.

Isaac Asimov, a renowned science fiction author, is widely recognised for his literary contributions, particularly his robot novels, among numerous others. In the early years of the previous century, Asimov formulated the Three Laws of Robotics, which were subsequently integrated into the "positronic" brains of his fictional robots. The primary objective of these laws was to safeguard humanity from a potential "robot revolution" and to mitigate the risk of human exploitation of these artificial beings (Shukla & Vijay, 2013).

- **Three Laws of Robotics:**

→ According to the first law of robotics, it is prohibited for a robot to do injury to a human person, either actively or passively by failing to take action.

→ According to the First Law of Robotics, a robot is obligated to comply with the commands issued by human individuals, unless such commands are in direct contradiction with the aforementioned law.

→ In accordance with the First and Second Law, it is imperative for a robot to safeguard its own life, provided that this objective does not contradict the aforementioned laws.

- **Brainwashing:**

The aforementioned three principles serve as a noteworthy illustration of the challenges inherent in designing an artificial neural network. The human brain has undergone evolutionary changes over millions of years in response to the need for survival and social interaction. The procedure is still ongoing.

When examining human civilization, characterised by its many cultural, religious, ethical, and moral perspectives, it is pertinent to inquire about the specific objectives and underlying intentions driving our collective endeavours.

On a pragmatic level, it is conceivable to develop an artificial intelligence in the form of an android or machine, which would operate as an impartial entity (assuming the feasibility of defining neutrality, given the need of establishing a value system). The primary objective of this entity, for instance, would be to engage in educational endeavours.

A comprehensive examination of the many domains within the field of artificial intelligence was undertaken, whereby an extensive survey of existing scholarly works was done to compile pertinent knowledge and perspectives. The process included doing searches in scholarly databases, perusing research papers, examining conference proceedings, and consulting credible web sources. In order to assure the timeliness of the material, we opted for recent research that have been published within the last five years. The primary emphasis was placed on comprehending the fundamental principles, methodologies, and progressions within each domain of artificial intelligence.

In relation to each specific application domain, we executed the following procedures:

➢ Literature Review: Our research included a comprehensive examination of scholarly articles, industry reports, case studies, and empirical illustrations that demonstrated the practical use of artificial intelligence within the relevant domain.

➢ Data Collection: In instances where it was appropriate, we gathered pertinent data or statistics pertaining to the influence and efficacy of artificial intelligence (AI) inside each respective domain.

➢ Expert Interviews: The researchers conducted interviews with professionals from several fields to get valuable insights into their personal experiences, encountered problems, and professional perspectives about the integration of artificial intelligence (AI).

Advantages and Disadvantages of AI

Advantages:

- The relentless execution of tasks is a significant benefit of artificial intelligence. Surprisingly, it is feasible to accomplish a certain task without the need of taking a lunch break or a coffee break, thanks to the use of artificial intelligence. In contrast to humans, who need frequent breaks, machines possess the ability to swiftly complete tasks, which may not necessarily be disadvantageous. Therefore, it is evident that the concept of the "tireless factor" has made a significant contribution to the achievements of artificial intelligence in its current form.
- The advent of artificial intelligence has significantly facilitated the process of replication. The act of copying, in this context, does not pertain to a student replicating the work of another individual during an examination. The term "artificial intelligence" refers to the process of instructing an artificial cognitive system to carry out a certain activity, essentially replicating task execution. In contrast to educating a substantial workforce to execute a certain set of duties, training an artificial intelligence to complete the same tasks presents a somewhat more viable alternative (Khanzode & Sarode, 2020).
- In the most, if not whole, of instances when a human being engages in decision-making, they do it by giving significant weight to their emotions. The psychological hindrance experienced by humans is not there when a task is performed by an artificial intelligence. The use of an artificial intelligence system prioritises the making of rational and practical judgements, while minimising the influence of emotional factors. Perhaps this might be attributed to the absence of genuine emotions experienced by an artificial intelligence.
- Artificial intelligence (AI) is used in the domain of space exploration. The use of intelligent robots has potential for space exploration.
- The devices have the capacity to withstand the challenging conditions present in the interplanetary space due to their mechanical nature. These organisms possess the ability to undergo adaptations that enable them to withstand the impact of planetary atmospheres without compromising their physical condition and functionality.
- Intelligent robots have the capability to be designed in such a way that they can successfully navigate and reach the lowest points on the Earth's surface, often referred to as nadirs. Excavation tools are used for the purpose of extracting fossil fuels. They have the potential to be used for mining applications. The use of machine intelligence has the potential to be employed in the exploration of oceanic depths. These technologies effectively assist humans, particularly in situations when human intellect is significantly constrained.
- The potential for intelligent robots to replace human beings in several domains of employment is a distinct possibility. Robots has the capability to do certain arduous jobs.
- Robotic technology has the potential to assume the tasks traditionally performed by humans, therefore relieving individuals of laborious and meticulous operations. Due to the inherent intelligence embedded inside them, robots possess the capability to assume a certain degree of responsibility. Individuals have the capacity to develop self-management skills and effectively allocate their time in order to successfully accomplish the tasks allocated to them.
- The presence of emotions often impedes the capacity for logical thought in human individuals, while artificial thinkers are unaffected by such hindrances. Robots, although devoid of emotional capacity, possess the ability to engage in logical reasoning and make sound judgements. Sentiments are linked to emotional states that have an impact on human productivity. However, robots equipped with artificial intelligence do not exhibit the same characteristics.
- Therefore, the use of artificial intelligence may effectively streamline the execution of monotonous and labor-intensive operations.
- Intelligent machines have the potential to be used for the execution of certain hazardous jobs. Machines endowed with artificial intelligence have the capability to engage in serious planning in order to achieve job fulfilment, and thereafter adapt their parameters, such as speed and time, appropriately. Individuals have the capacity to exhibit prompt action, remaining impervious to emotional influences, while striving for optimal job execution (Khanzode & Sarode, 2020).

Disadvantages:

- The potential for system failure is a significant drawback, if not the most prominent one, of artificial intelligence. Purchasing a vehicle for a substantial amount of money with the intention of using it for transportation between two points, only to have a breakdown shortly after acquisition, may be likened to an unfortunate scenario. Likewise, artificial intelligence pertains to the seamless execution of tasks, although in the case of a malfunction, the whole situation might become unfavourable.
- In addition to the potential for system failure, there exists a constant and impending threat of data loss. In some instances, as a result of the dysfunction of particular components, a system may have a failure to retain the data it is intended to store in its memory. This phenomenon may also occur in human beings. When an individual assumes responsibility for the gathering and retention of data yet neglects to fulfil their obligations, it is often acknowledged and categorized as human error. However, the absence of expectation associated with a machine significantly distinguishes it, eventually rendering it a disadvantage (Khanzode & Sarode, 2020).
- One primary consideration pertaining to the implementation of artificial intelligence is on the ethical and moral implications. Is it morally acceptable to produce duplicates of human beings? Do our ethical principles permit us to replicate or generate artificial intelligence? Intelligence is ultimately an innate endowment bestowed by nature. The act of incorporating it into a machine for the purpose of harnessing its advantages may not be ethically justifiable.
- Consider the scenario of robots operating inside healthcare settings. Can you see them demonstrating care and concern towards the patients? Consider the hypothetical scenario of highly intelligent robots being used inside creative industries. Do you believe that robots will demonstrate exceptional performance in these fields? The absence of a creative intellect is a characteristic inherent in thinking robots. Human beings possess both emotional and intellectual capacities. Cognitive and affective processes are attributed to them. The emotions experienced by individuals influence their cognitive processes (Khanzode & Sarode, 2020).
- The potential widespread substitution of people by robots across many industries might result in a significant rise in unemployment rates, leaving individuals without gainful work opportunities.
- The absence of occupied time might potentially lead to its detrimental use. It is anticipated that artificial intelligence would assume control over several domains and displace human workers from their current roles.
- In addition to the aforementioned concerns, there exists apprehension over the potential of robots surpassing human capabilities. Ideally, it is desirable for human beings to retain their position as the dominant entities over robots. In the event of a reversal of circumstances, there is a potential for the world to descend into a state of disorder and confusion. There is a possibility that intelligent robots might surpass human intelligence, perhaps leading to a scenario in which they subjugate humanity and assume global governance. The excessive and self-serving nature of human creativity has the potential to pose a significant threat to the well-being and survival of the human species. Ultimately, the decision to support artificial intelligence or acknowledge the potential catastrophic consequences it may entail rests with the individual. From my perspective, it may be argued that there exists no optimal substitute for the presence of human individuals. Artificial intelligence has the potential to mitigate the challenges encountered by humans; nonetheless, it is important to acknowledge that intelligent computers can never possess the whole range of human qualities (Khanzode & Sarode, 2020).

CONCLUSION

The machines possess the ability to engage in analytical thinking by using conceptual frameworks. Significant advancements have been achieved in different domains as a result of the use of Artificial Intelligence methods throughout the last two decades. The significance of Artificial Intelligence is expected to grow significantly across several domains. This paper explores the concept of artificial intelligence (AI) and its application in various domains. In particular, it focuses on how AI approaches are used in accounting databases, medical picture categorization, network intrusion

detection, and power system stabilisers (PSS) to maintain system stability and reduce oscillation. Additionally, the paper discusses the utilisation of AI techniques in computer games to address common The field of Network Intrusion Detection has promising prospects for future advancements, while the subject of Power System Stabilizers also exhibits clear potential for further development. It is evident that there is potential for more study in this field, given the very promising and financially advantageous outcomes that may be achieved via the use of these methodologies. Scientists have not yet fully realized the potential and capabilities of artificial intelligence. The potential impact of this technology and its many uses on human existence in the foreseeable future is expected to be extensive.

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