



## **Artificial Intelligence – An overview**

**\* Hemashree.S, Dhanalakshmi.B**

MGR College of Arts and Science, Hosur, Krishnagiri, Tamil Nadu, India.

\*Corresponding author Email: [dhanabasappa06@gmail.com](mailto:dhanabasappa06@gmail.com)

**Abstract.** Artificial Intelligence (AI) is a multidisciplinary field whose goal is to automate activities that presently require human intelligence. Recent successes in AI include computerized medical diagnosticians and systems that automatically customize hardware to particular user requirements. Artificial intelligence (AI) is intelligence - perceiving, synthesizing, and inferring information - demonstrated by machines, as opposed to intelligence displayed by animals and humans. Example tasks in which this is done include speech recognition, computer vision, translation between (natural) languages, as well as other mappings of inputs. AI also draws upon computer science, psychology, linguistics, philosophy, and many other fields. The field was founded on the assumption that human intelligence "can be so precisely described that a machine can be made to simulate it".

**Keywords:** ML, Cyber security, Voice Recognition, IOT

### **1. Introduction**

Artificial Intelligence is a branch of computer science which displays or stimulates human intelligence by machines or a process of to make machines think intelligently. According to the father of AI, JOHN McCarthy, it is "The science and engineering intelligent computer programs". AI researchers have adapted and integrated a wide of problem-solving techniques – including search and mathematical optimization, formal logic, artificial neural networks, and methods based on statistics, probability and economics. AI also draws upon computer science, psychology, linguistics, philosophy, and many other fields. In today's world, technology is growing very fast, and we are getting in touch with different new technologies day by day. Here, one of the booming technologies of computer science is Artificial Intelligence which is ready to create a new revolution in the world by making intelligent machines. The Artificial Intelligence is now all around us. It is currently working with a variety of subfields, ranging from general to specific, such as self-driving cars, playing chess, proving theorems, playing music, Painting, etc. AI is one of the fascinating and universal fields of Computer science which has a great scope in future. AI holds a tendency to cause a machine to work as a human.

### **2. History of AI**

1956 - John McCarthy coined the term 'artificial intelligence' and had the first AI conference. 1969 - Shakey was the first general-purpose mobile robot built. It is now able to do things with a purpose vs. just a list of instructions. 1997 - Supercomputer 'Deep Blue' was designed, and it defeated the world champion chess player in a match. It was a massive milestone by IBM to create this large computer. 2002 - The first commercially successful robotic vacuum cleaner was created. 2005 - 2019 - Today, we have speech recognition, robotic process automation (RPA), a dancing robot, smart homes, and other innovations make their debut. 2020 - Baidu releases the Linear Fold AI algorithm to medical and scientific and medical teams developing a vaccine during the early stages of the SARS-CoV-2 (COVID-19) pandemic. The algorithm can predict the RNA sequence of the virus in only 27 seconds, which is 120 times faster than other methods.

### **3. Latest technology in AI**

Natural language processing: Natural language generation is a trendy technology that converts structured data into the native language. Speech recognition: Speech recognition is another important subset of AI that converts human speech into a useful and understandable format by computers. Virtual agents: Virtual agents have become valuable tools for instructional designers. A virtual agent is a computer application that interacts with humans. Decision management: Decision management helps in making quick decisions, avoidance of risks, and in automation of the process. The decision management system is widely implemented in the financial sector, the health care sector, trading, insurance sector-commerce etc....

Machine learning (ML): Machine learning is a division of AI which empowers machine to make sense from data sets, without being actual programmed. It helps businesses to make informed decisions with data analytic performed using algorithms and statistical models. Robotic process automation (RPA): RPA is an application of artificial intelligence that configures a robot to interpret, communicate and analyse data.

#### 4. Most advanced and leading AI research

**Natural language processing:** NLP is a branch of artificial intelligence (AI) that focuses on helping computers understand the way that humans write and speak. As such, these systems capture meaning from an input of words and produce an output that can vary depending on the application.

**Enhanced Collaboration:** Rapid advancements in machine learning are playing a key role in helping to understand and manage collaboration. You see it in the growing sophistication of voice prompt systems, and in systems that interpret with some accuracy what you need based on a few words stated. With each passing month, the technology gets better and better. “While there are various tools available that provide a bird’s eye view into collaboration, innovative applications of NLP and Social Network Analysis (SNA) can provide much deeper insight,” said Jason Morgan, Vice President of Behavioural Intelligence, Aware.

**Work place Sentiment:** Modern natural language processing techniques are now able to accurately assess in real time the sentiment, toxicity, and hot topics of conversation occurring in a workplace. This is probably something valued by top management but viewed with suspicion by the workforce in general. Everything you say over Teams, phone, and email, could be interpreted by faceless software and evaluated. Obviously, such approaches are open to interpretation. The danger is that some quiet and somewhat anti-social programmer decides that anything rambunctious or enthusiastic is to be labelled as counter-productive and the workplaces get turned into a morgue. But that is only one possible outcome. Workplace spying systems became popular during the early days of the lockdowns. With everyone at home, management became suspicious that no one was working. Fortunately, sense eventually prevailed in most organizations. Such systems are now mainly deployed to note general employee behaviour and only flag the very worst offenders. But NLP can take them to another level. “These tools give leaders unprecedented real-time insight into an organization’s collaboration environment,” said Morgan. “Tracking organization sentiment and toxicity can arguably serve as key performance indicators for leaders who are supporting company culture, engagement, and wellbeing.

**NLP and Enterprise Collaboration:** Morgan added that effective use of NLP requires close integration with enterprise collaboration platforms. Only purpose-built tools with deep integrations will offer a comprehensive, contextualized view into conversations happening on collaboration platforms. “It’s important for collaboration leaders to incorporate such tools into their community management workflows in order to get the most out of their collaboration strategies,” said Morgan.

**Chatbots :** Chatbots are one of the most popular of current NLP applications. They have proliferated rapidly in recent years. Why have a human answer when a robot can do just as well? Or so the theory goes. Some systems are better than others. “NLP has grown in popularity for its ability to power applications that are proving to be helpful for businesses, from customer service chatbots to medical health lines,” said Rachel Roumeliotis, Vice President of AI and Data Content Strategy at O’Reilly Media. “Today, NLP is used to help to automate a variety of tasks for everyday employees, whether that’s auto completing a piece of writing or a line of code.

**Analysis of Data:** So much of the data we have is either spoken or in text. As time moves on and the technology becomes cheaper and faster, NLP could play an important role in gathering unstructured data and analysing it. Roumeliotis believes NLP will eventually become a de facto technology within organizations. “In the meantime, with the dearth of expertise in AI and the rise of APIs, in the near future we’ll see more Auto ML solutions and APIs that you can plug in,” she said. “They won’t necessarily be state-of-the-art and powerful, but they will be good enough for particular use cases, such as chatbots that aren’t mission critical, especially as we work through challenges like cost and compute power. In order to get to those kinds of mission critical use cases – such as assistance needed during a medical surgery – making models open source will be a critical step to teach people about NLP and help move innovations in the space forward at a fast pace.” [1]

**Brand’s Immersive Presence in Voice-driven Navigation Assistants:** The voice control technology is used in a number of different segments of products and services. Especially in cars, the technology is used to help achieve hand-free capabilities as drivers rely on an in-car voice assistant to accomplish many functions. Some of the primary tasks that can be accomplished using voice control technology include setting navigation, receiving hands-free calls, placing orders at restaurants, controlling in-car temperatures, windshield wiper operation, door locks, and so on. In fact, don’t be surprised if tomorrow your car’s voice assistant notifies you about your favourite restaurant on your destination route that is offering an attractive discount on your favourite cuisine! Brands are going to immerse themselves in every part of your journey and you as a customer will definitely enjoy the experience. [2]

**Cyber security:** “Most interestingly we see behavioural analysis tools increasingly using AI,” Finch said. “By that I mean tools analysing data to determine behaviour of hackers to see if there is a pattern to their attacks — timing, method of attack, and how the hackers move when inside systems. Gathering such intelligence can be highly valuable to defenders. “In a recent study, research firm Gartner interviewed nearly 50 security vendors and found a few patterns for AI use among them, says research vice president Mark Driver. “Overwhelmingly, they reported that the first goal of AI was to ‘remove false positives’ insofar as one major challenge among security analysts is filtering the signal from the noise in very large data sets,” Driver said. “AI can trim this down to a reasonable size, which is much more accurate. Analysts are able to work smarter and faster to resolve cyber-attacks as a result. “In general, AI is used to help detect attacks more accurately and then prioritize responses based on real world risk, Driver said. And it allows automated or semi-automated responses to attacks, and finally provides more accurate modelling to predict future attacks.

**Internet of things (IOT):** The Internet of things (IoT) describes physical objects (or groups of such objects) with sensors, processing ability, software and other technologies that connect and exchange data with other devices and systems over the Internet or other communications networks. Internet of things has been considered a misnomer because devices do not need

to be connected to the public internet, they only need to be connected to a network and be individually addressable. The field has evolved due to the convergence of multiple technologies, including ubiquitous computing, commodity sensors, increasingly powerful embedded systems, as well as machine learning. Traditional fields of embedded systems, wireless sensor networks, control systems, automation (including home and building automation), independently and collectively enable the Internet of things. In the consumer market, IoT technology is most synonymous with products pertaining to the concept of the "smart home", including devices and appliances (such as lighting fixtures, thermostats, home security systems, cameras, and other home appliances) that support one or more common ecosystems, and can be controlled via devices associated with that ecosystem, such as smart phones and smart speakers. IoT is also used in healthcare systems. There are a number of concerns about the risks in the growth of IoT technologies and products, especially in the areas of privacy and security.

**Asset Monitoring:** Asset tracking automates labour-intensive and error-prone equipment and inventory management by tracking assets and their usage in real-time throughout a facility, such as a building, warehouse, yard, or campus. How is IoT used in asset tracking sensors are built into or attached to equipment to collect real-time location and usage data. This information is then forwarded to a centralized management software for processing and analysis.

**Industrial Monitoring:** By monitoring the condition of assets, predicting maintenance, and ensuring quality, industrial monitoring improves the performance, productivity, and efficiency of industrial processes in manufacturing, mining, oil and gas, utilities, and other industries. What role does the IoT play in industrial monitoring? Smart sensors and actuators are used in industrial monitoring to assess machine status and transmit that information to centralized management software.

**Smart Badges:** Organizations can take a simple yet sophisticated approach to identifying, locating, and providing secure access to employees in their facilities by issuing sensor-based badges to employees and guests. How do smart badges make use of IoT? Smart badges are ID card-sized portable trackers that use embedded IoT sensors to provide accurate and continuous geolocation for tracking, zone notification, and workforce safety and security monitoring.

**Fleet Management:** Fleet management enables fleet managers to automate processes by providing real-time visibility into vehicle maintenance, usage, and driver performance. What role does IoT play in fleet management? Fleet management makes use of telematic sensors attached to vehicles that send data back to management software, allowing organizations to better allocate resources, plan, and adapt to changing situations.

**Smart Buildings:** Smart buildings enable organizations to monitor and control various building characteristics in order to optimize the environment and operations of a building, such as automating and controlling security or air conditioning. How is IoT used in smart buildings? Organizations can monitor, manage, and analyse multiple building systems using connected sensors and software to gain insights into patterns and trends to optimize building and/or campus operations. [3]

## 5. Future of AI

AI will undoubtedly produce more jobs. However, it will also reorganize many of the present employment roles. From fast-food restaurants to healthcare and agriculture, you name it, and everything will be present. For example, in cloud computing, AI can accurately predict the level of workload, allowing the Dev Ops team to design tests and cooperate with the site reliability engineering (SRE) team. The incorporation of AI into healthcare would necessitate nursing practice with robots. Manufacturing sector to be impacted by AI: Because it was an early adopter, AI has a strong presence in the manufacturing industry. According to recent reports, 60% of firms are already utilizing Artificial Intelligence in the two most popular areas – maintenance and quality control. However, in order for new technology to function, specialized skills are still required. Collaborative robots, for example, may help humans with complex tasks, but humans must program them to teach them how to do so. Certainly, there is an obvious need for people's talents to evolve in order to fill positions that machines cannot. AI's role in cyber security: Cyber security has one of the fastest wage growth rates. With artificial intelligence gaining traction in cyber security, young and inexperienced cyber security executives are fearful about losing their jobs. It clearly has the advantage in terms of maximizing speed, providing protection, breadth of coverage, and assisting in the automation of complex procedures. However, these technologies are only as effective as their human controllers. Only humans are capable of spotting deeper layers of company risk. This is one area where cyber security firms would like to put a potential employee to the test. Engineers' role in sure site reliability's roles will experience significant transformation as AI and ML redefine them. The SRE team can use ML to avoid chores like preparing apps for production and tweaking them for a specific task. Because it requires a multitude of permutations and combinations, Artificial Intelligence may be able to handle it better, freeing up humans for higher-value tasks. AI in Robotics: One key technology that has the potential to replace people on a massive scale is robotics. According to the latest industry estimates, the Robotics market is currently valued at \$103 billion and is expected to increase to \$ 210 billion by \$210 billion. Given the potential for expansion, one can fairly expect that the job market will only expand, with a growing demand for robotic engineers. Artificial intelligence and the creative industry: It is common knowledge that AI is not only creative but also has a high level of creative intelligence. This is a valid assumption because mental skills such as having several approaches to a problem and the capacity to connect dots to uncover a pattern constitute creative thinking, and AI is capable of doing it all fairly effectively. However, the ability to use intuition, identify context, and hence have emotional responses are unique to humans. The metaverse and AI: The metaverse is no longer a buzzword, but rather a self-contained system with its own economy. As a result, it has the ability to open the door to a variety of options in an AI-enabled virtual reality universe. Though it is still in its early stages, the convergence of technologies such as AI, VR, gaming, blockchain, 5G, and augmented reality (AR) has already spawned a plethora of opportunities such as game designers, NFT strategists, Blockchain designers, and so on. No code – low code AI: "The low-code-no-code trend in AI is viewed as a threat to the developer's employment. According to experts, it will just fill

holes rather than make developers obsolete. However, in order for this to happen, IT and software engineers must make the necessary transitions away from traditional IT positions. To supplement their technical knowledge, they should take on additional duties such as engaging with business teams. Augmented workforce: As Artificial Intelligence becomes more widely adopted; businesses will look for ways to teach their employees to be more adaptive to greater levels of abstract thinking. Aside from making individuals 'AI-ready,' a big take away from this initiative would be the large-scale system upgrade. Some may consider it a utopian condition, as a totally automated work environment may not become a reality for decades, if ever: As AI continues to kill jobs; people will be required to train and sustain it. Artificial intelligence is based on algorithms that have been trained to do specific tasks. When a chatbot recognizes sarcasm in your remarks, it is because it has data from thousands of humans uttering the words in varied tones. Clearly, techniques like NLP and voice processing require human input for varied conversational circumstances, and this element is far too dynamic to render people obsolete as trainers. In addition, as an interface between AI-enabled technologies and business leaders, a new breed of employment categories such as explainers and strainers will develop. [4]

## **6. Conclusion**

AI is like a two-edged sword, at one end can solve problems "Intelligently" at another end they pose a problem themselves. AI holds the key to unlocking a magnificent future where, driven by data and computers that understand our world, we will all make more informed decisions. These computers of the future will understand not just how to turn on the switches but why the switches need to be turned on. Even further, they may one day ask us if we need switches at all.

## **Reference**

- [1]. Drew Robe, editor – in-chief in an international engineering magazine, currently works freelance for IT publications.
- [2]. AiT staff writer, for more reference visit [news@martechseries.com](mailto:news@martechseries.com)
- [3]. Tushar – currently works at CIS (Software Development Company).
- [4]. Dhriti.M – MBA in finance, Indian institute of foreign trade, Delhi.