

## **Introduction to Artificial Intelligence**

The term artificial intelligence has become widely used recently, and has become widespread everywhere, and has become one of the most preoccupied concepts in the world, but it is simply any system or device capable of simulating human intelligence, which enables it to perform tasks.

### **What is Artificial Intelligence?**

Artificial Intelligence (AI) can be defined as the intelligence of machines that can imitate human capabilities through a set of techniques such as the ability to learn and infer.

The term artificial intelligence is associated with many electronic devices such as: robots, cellular devices and computers, which may have intellectual capabilities similar to those of humans. Examples that suggest the presence of artificial intelligence technology in these devices include medical diagnosis, playing chess, search engines, voice recognition, and electric cars.

### **Advantages and disadvantages of artificial intelligence**

Artificial intelligence has enormous advantages, it can change any field, but in return it is accompanied by disadvantages. The following is an explanation of the most important advantages and disadvantages of artificial intelligence.

#### **Advantages**

- ❖ Reducing the time and effort spent in implementing some difficult tasks.
- ❖ It deals with information better than humans.
- ❖ It provides a new mechanism for solving new problems.
- ❖ Using machines equipped with artificial intelligence in dangerous situations such as sending a submarine to the bottom of the ocean, or sending a robot into space where it is difficult for humans to be present.
- ❖ It provides higher speed and efficiency in performing tasks.

#### **Disadvantages**

- ❖ need to experts who are proficient in the field of artificial intelligence.
- ❖ need to skilled programmers to develop programs to implement artificial intelligence.
- ❖ The cost of implementing artificial intelligence is very high.
- ❖ The development of its own software is slow and expensive.
- ❖ A Robot is one of the applications of artificial intelligence, as it replaces jobs, which will lead to unemployment

### **Risks of Artificial Intelligence**

Despite the great benefits that artificial intelligence offers in several fields, there is another side to this technology, which is the risks that may result if it is used outside the framework of human interest.

- ❖ It is important for governments to set some rules for using artificial intelligence rationally.
- ❖ It is estimated that a many jobs may be transformed into automation, and thus millions of workers and employees will lose their jobs.
- ❖ The use of artificial intelligence technology for military purposes is a greater threat to humanity, and the United States, Russia and China are among the leading countries in this field, as they have allocated huge budgets for this offer, and even they have banned the export of information and equipment in this field.

## The most important areas of artificial intelligence

There is no doubt that artificial intelligence technology has entered all aspects of our daily lives and all sectors that can be affected by it. We have begun to see it in the health, education, industry and space fields. You must have seen it in some robots, self-driving electric cars and some phone applications

These are the most important areas in which AI technology intervenes directly:

- ❖ Industry, through robots that have become characterized by the ability to perform some human tasks.
- ❖ Application and program development. AI technologies help develop some programs and applications in many fields such as engineering, health care, investment, agriculture and trade
- ❖ Develop highly intelligent systems and engines, such as drones and self-driving cars.
- ❖ Develop smart systems that help recognize faces and recognize voices.
- ❖ Develop algorithms that help develop search engines on computers over the Internet.
- ❖ Develop advanced systems that help trade and analyze stocks faster and easier.

## The Evolution of Artificial Intelligence Over the Past 60 Years

Artificial intelligence (AI) has made remarkable advancements over the past six decades, with significant technological developments and research breakthroughs. Here's a look at its evolution:

### The 1950s and 1960s: The Beginnings

- **\*Foundations:** AI began as a concept with the advent of computing.
- **\*Early Research:** The first AI conference was held at Dartmouth in 1956, where foundational theories were established.

### The 1970s and 1980s: Symbolic AI

- **\*Expert Systems:** Development of expert systems that used knowledge-based rules to simulate the abilities of experts in specific fields.
- **\*Challenges:** Limitations in handling unstructured data.

### The 1990s and Early 2000s: Data-Driven AI

- **\*Machine Learning:** Emergence of machine learning and deep learning techniques due to the availability of vast amounts of data and increased computational power.
- **\*Internet:** The rise of the internet and data availability accelerated AI development.

### The Last Decade: Advanced AI

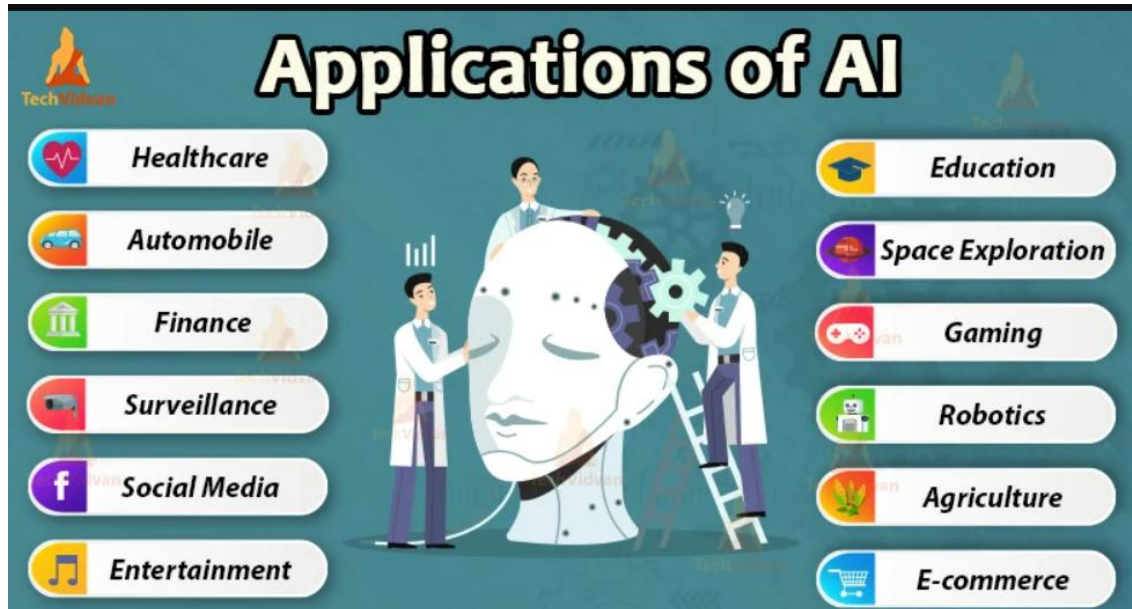
- **\*Deep Learning:** Advancement of deep learning techniques, including applications like speech and image recognition and natural language processing.
- **\*Advanced Applications:** Use of AI in autonomous vehicles, smart assistants like Alexa and Google Assistant.

### Current Era: Interactive and Integrative AI

- **\*Interaction and Integration:** Integration of AI with the Internet of Things (IoT) and cloud computing.
- **\*Challenges:** Addressing security and privacy issues and developing laws and policies to regulate AI use.

Today, AI plays a crucial role in our daily lives, from improving healthcare to enhancing productivity in work and industry, and even entertainment. The continuous evolution of AI promises a bright future filled with new possibilities and innovations.

## Artificial Intelligence Applications



### 1. Healthcare

One of the foremost deep-lying impacts which AI has created is within the Healthcare space.

A device, as common as a **Fitbit or an iWatch**, collects a lot of data like the sleep patterns of the individual, the calories burnt by him, heart rate and a lot more which can help with early detection, personalization, even disease diagnosis.

This device, when powered with AI can easily monitor and notify abnormal trends. This can even schedule a visit to the closest Doctor by itself and therefore, it's also of great help to the doctors who can get help in making decisions and research with AI.

It has been used to predict ICU transfers, improve clinical workflows and even pinpoint a patient's risk of hospital-acquired infections.

### 2. Automobile

At this stage where automobiles changing from an engine with a chassis around it to a software-controlled intelligent machine, the role of AI cannot be underestimated.

The goal of self-driving cars, during which **Autopilot by Tesla** has been the frontrunner, takes up data from all the Tesla's running on the road and uses it in machine learning algorithms. The assessment of both chips is later matched by the system and followed if the input from both is the same.

AI are often witnesses working its magic through robots producing the initial nuts and bolts of a vehicle or in an autonomous car using machine learning and vision to securely make its way through traffic.

### 3. Banking and Finance

One of the early adopter of Artificial Intelligence is the Banking and Finance Industry.

From Chatbots offered by banks, for instance , **SIA** by depository financial institution of India, to intelligent **robo-traders by Aidya** and **Nomura Securities** for autonomous, high-frequency trading, the uses are innumerable.

Features like AI bots, digital payment advisers and biometric fraud detection mechanisms cause higher quality of services to a wider customer base.

### 4. Surveillance

AI has made it possible to develop face recognition Tools which may be used for surveillance and security purposes.

As a result, this empowers the systems to monitor the footage in real-time and can be a pathbreaking development in regards to public safety.

Manual monitoring of a **CCTV camera** requires constant human intervention so they're prone to errors and fatigue. AI-based surveillance is automated and works 24/7, providing real-time insights.

According to a report by the Carnegie Endowment for International Peace, a minimum of 75 out of the 176 countries are using AI tools for surveillance purposes.

### 5. Social Media

Social Media is not just a platform for networking and expressing oneself. It subconsciously shapes our choices, ideologies, and temperament.

All this due to the synthetic Intelligence tools which work silently within the background, showing us posts that we “might” like and advertising products that “might” be useful based on our search and browsing history.

For example, recently **Instagram** revealed how it's been using AI to customize content for the Explore Tab.

This helps with social media advertising because of it's unprecedented ability to run paid ads to platform users based on highly granular demographic and behavioral targeting.

Did you know, we also have AI tools that will actually write Facebook and Instagram ads for us. Another huge benefit of AI in social media is that it allows marketers to analyze and track every step that they take.

### 6. Entertainment

The show business , with the arrival of online streaming services like **Netflix** and **Amazon Prime**, relies heavily on the info collected by the users.

This helps with recommendations based upon the previously viewed content. This is done not only to deliver accurate suggestions but also to create content that would be liked by a majority of the viewers.

With new contents being created every minute , it is very difficult to classify them and making them easier to search.

AI tools analyze the contents of videos frame by frame and identify objects to feature appropriate tags. AI is additionally helping media companies to form strategic decisions.

## 7. Education

In the education sector also, there are a number of problems which will be solved by the implementation of AI .

A few of them being automated marking software, content retention techniques and suggesting improvements that are required.

This can help the teachers monitor not just the academic but also the **psychological, mental and physical well being** of the students but also their all-round development. This would also help in extending the reach of education to areas where quality educators can't be present physically.

For Example, Case-based simulations offered by Harvard graduate school is one such use.

## 8. Space Exploration

AI systems are being developed to scale back the danger of human life that venture into the vast realms of the undiscovered and unraveled universe which is a very risky task that the astronauts need to take up.

As a result, unmanned space exploration missions just like the Mars Rover are possible due to the utilization of AI.

It has helped us discover numerous exoplanets, stars, galaxies, and more recently, two new planets in our very own system.

**NASA** is also working with AI applications for space exploration to automate image analysis and to develop autonomous spacecraft that would avoid space debris without human intervention, create communication networks more efficient and distortion-free by using an AI-based device.

## 9. Gaming

In the gaming industry also , computer game Systems powered by AI is ushering us into a replacement era of immersive experience in gaming.

AI is employed to get responsive, adaptive or intelligent behaviors primarily in **non-player characters (NPCs)** almost like human-like intelligence in video games. It serves to enhance the game-player experience instead of machine learning or deciding .

AI has also been playing a huge role in creating video games and making it more tailored to players' preferences.

## 10. Robotics

With increasing developments within the field of AI, robots are becoming more efficient in performing tasks that earlier were too complex.



The idea of complete automation are often realized only with the assistance of AI, where the system can't just perform the specified task but also monitor, inspect and improve them without any human intervention.

AI in robotics helps the robots to learn the processes and perform the tasks with complete autonomy, without any **human intervention**. This is because robots are designed to perform repetitive tasks with utmost precision and increased speed.

AI has been introducing flexibility and learning capabilities in previously rigid applications of robots. These benefits are expected to reinforce the market growth.

## **11. Agriculture**

Artificial Intelligence is changing the way we do one among our most primitive and basic professions which is farming.

The use of AI in agriculture are often attributed to agriculture robots, predictive analysis, and crop and soil monitoring.

In addition, drones are also used for spraying insecticides and detecting weed formation in large farms. This is getting to help firms like **Blue River Technologies**, better manage the farms.

AI has also enhanced crop production and improved real-time monitoring, harvesting, processing and marketing.

## **12. E-Commerce**

This is one of the Artificial Intelligence Applications that's found to be widely used.

Different departments of E-commerce including logistics, predicting demand, intelligent marketing, better personalization, use of chatbots, etc. are being disrupted by AI.

The E-Commerce industry, a prominent player being **Amazon** is one among the primary industries to embrace AI. This may experience a good use of AI with time.

E-commerce retailers are increasingly turning towards chatbots or digital assistants to supply 24x7 support to their online buyers. Built using AI technologies, chatbots are becoming more intuitive and are enabling a far better customer experience.