

Introduction

Intelligence: “The capacity to learn and solve problems”

Artificial Intelligence: is the simulation of human intelligence by machines.

- The ability to solve problems
- The ability to act rationally
- The ability to act like humans

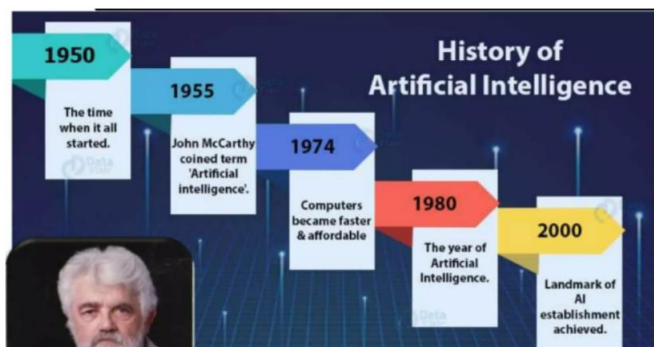
The central principles of AI include:

- Reasoning, knowledge, planning, learning and communication
- Perception and the ability to move and manipulate objects
- It is the science and engineering of making intelligent machines, especially computer intelligent programs.

DEFINITION

- Computers with the ability to mimic or duplicate the functions of the human brain.
- Artificial intelligence is the intelligence of machines and branch of computer science which aims to create it.
- “The branch of computer science that is concerned with the automation of intelligent behaviour.

HISTORY OF AI



APPLICATIONS OF AI IN MEDICINE

- A medical clinic can use AI systems to organize
- bed schedules, make a staff rotation and provide medical information.
- AI has also application in the fields of cardiology(CRG), neurology (MRI), embryology

(sonography), complex operations of internal organs.

- AI also has an application in Image guided surgery and image analysis and enhancement.

APPLICATIONS OF AI IN MUSIC

- Scientist are trying to make computer emulate the activities of the skillful musician.
- composition, performance, music theory, sound processing is some of the major areas on which research in music and AI are focusing on.
 - Eg. : chucks, smart music and etc.

APPLICATION OF AI IN TELECOMMUNICATIONS

- Many telecommunications companies make use of heuristic search in the management of their workforces.
- For example, BT group has deployed heuristic search in a scheduling application that provides the work schedules of 20000 engineers.

ROBOTICS AND AI

- A ROBOT is a mechanical or virtual artificial agent, usually an electro mechanical machine that is guided by a computer or electronic.
- Robots can be autonomous or semi-autonomous.
- A robot may convey a sense of intelligence or thoughts of its own.

APPLICATION OF AI IN GAMING

- In the earlier days gaming technology was not broadened.
- Physicist Willy Higinbotham created the first video game in 1958.
- It was called “**Tennis For Tow**” and was oscilloscope
- But, now AI technology has become vast and standard has also been increased.

For Eg: Suduko, Fear, Fallout, etc.

APPLICATIONS OF AI BANKING

- Organize operations, invest in stocks, and manage properties.
- In August 2001, robots beat humans in a simulated financial trading competition.

- Some other applications include loan investigate, ATM design safe and fast banking, etc.

Some Other Applications

- Credit Granting
- Information Management and Retrieval
- AI and Expert Systems embedded in products
- Plant layout
- Help desk and assistance
- Employee Performance Evaluation
- Shipping
- Marketing
- Warehouse Optimization
- In Space workstation maintenance
- Satellite controls
- Network developments
- Nuclear Management

ARTIFICIAL INTELLIGENCE

➤ <u>Advantages :</u>	➤ <u>Disadvantages :</u>
<ul style="list-style-type: none"> ▪ More powerful and more useful computers. ▪ New and improved interfaces. ▪ Solving new problems. ▪ Better handling of information. ▪ Relieves information overload. ▪ Conversion of information into knowledge. 	<ul style="list-style-type: none"> ▪ Increased costs ▪ Difficulty with software development – slow and expensive ▪ Few experienced programmers ▪ Few practical products have reached the market as yet.

FUTURE OF AI

- Looking at the features and its wide application we may definitely stick to AI.
- Seeing at the development of AI is it that the future world is becoming artificial.
- Biological intelligence is fixed, because it is an old, mature paradigm but the new paradigm of non-biological computation and intelligence is growing exponentially.
- The memory capacity of the human brain is probably of the order of ten thousand million binary digits. But most of this is probably used in remembering visual impressions, and other comparatively wasteful ways.

- Hence, we can say that as natural intelligence is limited and volatile too world may now depend upon computers for smooth working.

HUMANOID ROBOT AND AI

- Sophia is a social humanoid robot developed by Hong Kong based company Hanson Robotics.
- **Sophia was activated on April 19, 2015.**
- She made her first public appearance at South by Southwest Festival in mid-March 2016 in United States.
- In October 2017 Sophia became a Saudi Arabian citizen, the first robot to receive citizenship in any country.

The Explosive Growth of AI

- Since AI is applicable in almost all fields, they become the needs of our life. It is the reason behind the explosive growth of AI.
- The growth can be divided into two parts based on the application area and what purpose they serve; they are as follows:
 - ✓ Growth in positive sense (useful in society)
 - ✓ Growth in negative sense (harmful in society)

Machine Learning

- ✓ Machine Learning is making the computer learn from studying data and statistics.
- ✓ Machine Learning is a step into the direction of artificial intelligence (AI).
- ✓ Machine Learning is a program that analyses data and learns to predict the outcome.

DATA SET

In the mind of a computer, a **data set** is any collection of data. It can be anything from an array to a complete database.

Example of an array:

[99,86,87,88,111,86,103,87,94,78,77,85,86]

DATA TYPES

To analyze data, it is important to know what type of data we are dealing with.

We can split the data types into three main categories:

- ✓ **Numerical**
- ✓ **Categorical**
- ✓ **Ordinal**

Numerical data are numbers and can be split into two numerical categories:

1. **Discrete Data** numbers that are limited to integers.

Example: The number of cars passing by.

2. **Continuous Data** numbers that are of infinite value.

Example: The price of an item, or the size of an item.

Categorical data are values that cannot be measured up against each other.

Example: a color value, or any yes/no values.

Ordinal data are like categorical data but can be measured up against each other.

Example: school grades where A is better than B and so on.

Machine Learning - Mean Median Mode

In Machine Learning (and in mathematics) there are often three values that interest us:

- Mean - The average value
- Median - The midpoint value
- Mode - The most common value

Example: We have registered the speed of 13 cars:

Speed=[99,86,87,88,111,86,103,87,94,78,77,85,86]

MEAN

- The mean value is the average value.
- To calculate the mean, find the sum of all values, and divide the sum by the number of values:
- The NumPy module has a method for this.
- Use the NumPy mean() method to find the AVERAGE SPEED:

MEDIAN

- The median value is the value in the middle after you have sorted all the values:
- It is important that the numbers are sorted before you can find the median.
- The NumPy module has a method for this:
- Use the NumPy median() method to find the middle value:

MODE

- The Mode value is the value that appears the most number of times:
 - **99, 86, 87, 88, 111, 86, 103, 87, 94, 78, 77, 85, 86 = 86**
- The SciPy module has a method for this.
- Use the SciPy mode() method to find the number that appears the most.

STANDARD DEVIATION

- Standard deviation is a number that describes how spread out the values are.

- **A low standard** deviation means that most of the numbers are close to the mean (average) value.
- **A high standard deviation** means the values spread over a wider range.

Example: This time we have registered the speed of 7 cars:

- The standard deviation is 0.9
- Meaning that most of the values are within the range of 0.9 from the mean value, which is 86.4.
speed = [86,87,88,86,87,85,86]

VARIANCE

- **Variance** is another number that indicates how spread out the values are.

PERCENTILE

- Percentiles are used in statistics to give you a number that describes the value that a given percent of the values are lower than.

HISTOGRAM

- To visualize the data set we can draw a histogram with the data we collected.