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INTRODUCTION TO

DATA SCIENCE   ARTIFICIAL INTELLIGENCE

MACHINE LEARNING   DEEP LEARNING

Topic:- Artificial Intelligence(lect no:-5)
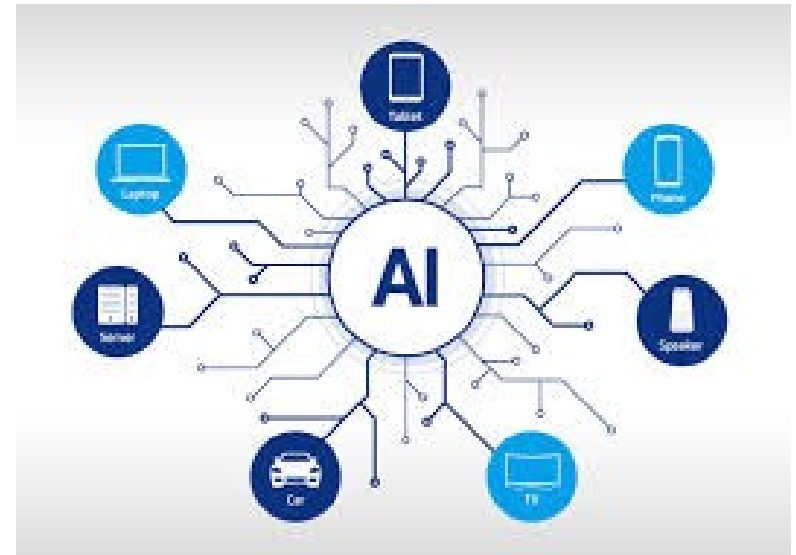
Certification & Internship Program

What Is Artificial Intelligence ?

Definition:Artificial Intelligence (AI) is a science that's used to construct intelligence using hardware and software solutions.

It is inspired by reverse engineering, for example, in the way that neurons work in the human brain. Our brain consists of small units called neurons, and networks of neurons called neural networks. Beyond neural networks, there are many other models in neuroscience that can be used to solve real-world problems in artificial intelligence.

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Artificial intelligence automates human intelligence based on the way human brain processes information.

AI makes computers appear to think like humans.

AI is performed by computers that are executing low-level instructions.

AI may stimulate human senses and thinking processes for specialized fields.

INTRO TO ARTIFICIAL INTELLIGENCE

Diversity of Disciplines

In order to create a usable AI solution, different disciplines are involved.

Robotics: To move objects in space

Algorithm Theory: To construct efficient algorithms.

Statistics: To derive useful results, predict the future, and analyze the past.

Psychology: To model how the human brain works.

Software Engineering: To create maintainable solutions that endure the test of time.

Computer Science or Computer Programming: To implement our software solutions in practice

Mathematics: To perform complex mathematical operations.

Control Theory: To create feed-forward and feedback systems

Information Theory: To represent, encode, decode, and compress information

Graph Theory: To model and optimize different points in space and to represent hierarchies

Physics: To model the real world

Computer Graphics and Image Processing to display and process images and movies

Fields and Applications of Artificial Intelligence?

Simulation of Human Behavior

Humans have five basic senses simply divided into visual, auditory, kinesthetic,olfactory, and gustatory. However, for the purposes of understanding how to create intelligent machines, we can separate disciplines as follows:

- Listening & Speaking
- Understanding Language
- Remembering Things.
- Thinking.
- Seeing.
- Moving.

Alan Turing, the inventor of the Turing machine, an abstract concept that's used in algorithm theory, suggested a way to test intelligence. This test is referred to as the Turing test in AI literature

Using a text interface, an interrogator chats to a human and a chatbot. The job of the chatbot is to mislead the interrogator to the extent that they cannot tell whether the computer is human or not.

What disciplines do we need to pass the Turing test?

First of all, we need to understand a spoken language to know what the interrogator is saying. We do this by using Natural Language Processing (NLP). We also have to respond.

We need to be an expert on things that the human mind tends to be interested in. We need to build an Expert System of humanity, involving the taxonomy of objects and abstract thoughts in our world, as well as historical events and even Emotions.

Intelligent Agents

When solving AI problems, we create an actor in the environment that can gather data from its surroundings and influence its surroundings. This actor is called an intelligent agent.

An intelligent agent:
- Is autonomous
- Observes its surroundings through sensors
- Acts in its environment using actuators
- Directs its activities toward achieving goals
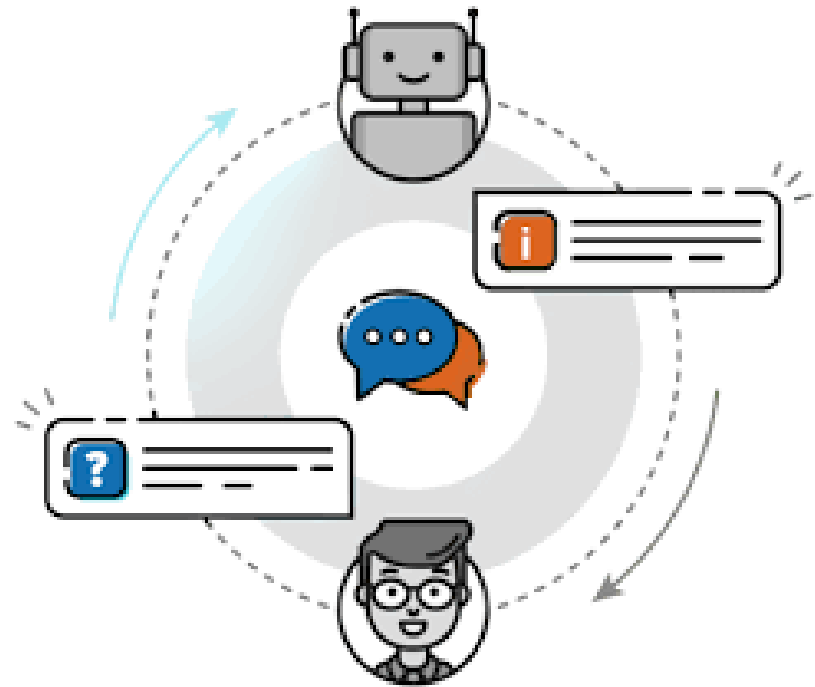
Different goals require different processes. Let's explore the two most popular types of AI reasoning: **classification** and **prediction**.

Classification

a process for figuring out how an object can be defined in terms of another object. For instance, a father is a male who has one or more children.

If Jane is a parent of a child and Jane is female, then Jane is a mother. Also, Jane is a human, a mammal, and a living organism. We know that Jane has a nationality as well as a date of birth.

Prediction

the process of predicting things, based on patterns and probabilities. For instance, if a customer in a standard supermarket buys organic milk, the same customer is more likely to buy organic yoghurt than the average Customer.

Learning Models

The process of AI learning can be done in a supervised or unsupervised way.

Supervised learning is based on labeled data and inferring functions from training data.

Linear regression is one example.

Unsupervised learning is based on unlabeled data and often works on cluster analysis.

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