Artificial Intelligance

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Abstract:- **A branch of Computer Science named Artificial Intelligence pursues creating the computers or machines as intelligent as human beings. Artificial Intelligence is a way of making a computer, a computer-controlled robot, or a software think intelligently, in the similar manner the intelligent humans think. AI is accomplished by studying how human brain thinks, and how humans learn, decide, and work while trying to solve a problem, and then using the outcomes of this study as a basis of developing intelligent software and systems.**
Artificial intelligence is a science and technology based on disciplines such as Computer Science, Biology, Psychology, Linguistics, Mathematics, and Engineering. A major thrust of AI is in the development of computer functions associated with human intelligence, such as reasoning, learning, and problem solving.

INTRODUCTION

AI can be categorized as either weak or strong. Weak AI, also known as narrow AI, is an AI system that is designed and trained for a particular task. Virtual personal assistants, such as Apple's Siri, are a form of weak AI. Strong AI, also known as artificial general intelligence, is an AI system with generalized human cognitive abilities. When presented with an unfamiliar task, a strong AI system is able to find a solution without human intervention.While AI tools present a range of new functionality for businesses, the use of artificial

intelligence raises ethical questions. This is because deep learning algorithms, which underpin many of the most advanced AI tools, are only as smart as the data they are given in training. Because a human selects what data should be used for training an AI program, the potential for human bias is inherent and must be monitored closely.

This generally involves borrowing characteristics from human intelligence, and applying them as algorithms in a computer friendly way. A more or less flexible or efficient approach can be taken depending on the requirements established, which influences how artificial the intelligent behavior appears.

IMPORTANCE OF AI

- *GAMING AI-*
  Plays role in strategic games such as chess, poker, tic-tac-toe, etc., where machine can think of large number of possible positions based on heuristic knowledge.

NATURAL LANGUAGE PROCESSING-

It is possible to interact with the computer that understands natural language spoken by humans.

- *EXPERT SYSTEMS* -There are some applications which integrate machine, software, and special information to impart reasoning and advising. They provide explanation and advice to the users.

- *SPEECH RECOGNITION-*

Some intelligent systems are capable of hearing and comprehending the language in terms of sentences and their meanings while a human talks to it. It can handle differentaccents, slang words, noise in the background, change in human's noise due to cold, etc.

- *VISION SYSTEMS-*
  These systems understand, interpret, and comprehendvisual input on the computer.

FOR EXAMPLE-

1) A spying aeroplane takes photographs which are used to figure out spatial information or map of the areas.

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2) Doctors use clinical expert system to diagnose the patient.

- *INTELLIGENT ROBOTS*
  Robots are able to perform the tasks given by a human. They have sensors to detect physical data from the real world such as light, heat, temperature, movement, sound, bump, and pressure. They have efficient processors, multiple sensors and huge memory, to exhibit intelligence. In addition, they are capable of learning from their mistakes and they can adapt to the new environment.

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- *UNDERSTANDING NATURAL LANGUAGE*
  Just getting a sequence of words into a computer is not enough. Parsing sentences is not enough either. The computer has to be provided with an understanding of the domain the text is about, and this is presentlypossible only for very limited domains.

HISTORY OF AI

1923 - Karel Capek's play named "Rossum's Universal Robots" (RUR) opens in London, first use of the word "robot" in English.

1943- Foundations for neural networks laid.

1945 - Isaac Asimov, a Columbia University alumni, coined the term Robotics.

1950 - Alan Turing introduced Turing Test for evaluation of intelligence and published Computing Machinery and Intelligence. Claude Shannon published Detailed Analysis of Chess Playing as a search.

1956 - John McCarthy coined the term Artificial Intelligence. Demonstration of the first running AI program at Carnegie Mellon University.

1958 - John McCarthy invents LISP programming language for AI.

1964 - Danny Bobrow's dissertation at MIT showed that computers can understand natural language well enough to solve algebra word problems correctly.

1965 - Joseph Weizenbaum at MIT built ELIZA, an interactive problem that carries on a dialogue in English.

1969 - Scientists at Stanford Research Institute Developed Shakey, a robot, equipped with locomotion, perception, and problem solving

1973 - The Assembly Robotics group at Edinburgh University built Freddy, the Famous Scottish Robot, capable of using vision to locate and assemble models.

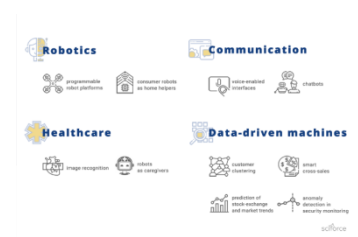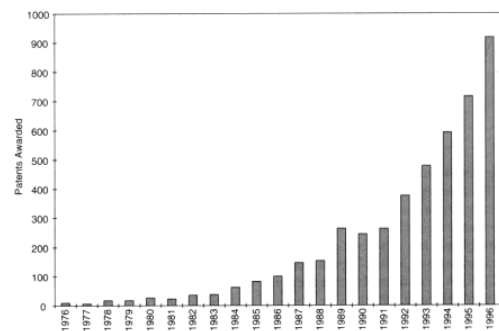**1979** - The first computer-controlled autonomous vehicle, Stanford Cart, was built.

1985 - Harold Cohen created and demonstrated the drawing program, Aaron.

1990 - Major advances in all areas of AI:

- Significant demonstrations in machine learning.
- Case-based reasoning.
- Multi-agent planning.
- Scheduling.
- Data mining, Web Crawler.
- Vision, Virtual Reality.
- Games.
- Natural language understanding and translation.

1997 - The Deep Blue Chess Program beats thethen world chess champion, Garry Kasparov.

2000 - Interactive robot pets become commercially available. MIT displays Kismet, a robot with a face that expresses emotions. The robot Nomad explores remote regions of Antarctica and locates meteorites.

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AI DEVELOPMENTS

WHAT IS INTELLIGENCE ?

The ability of a system to calculate, reason, perceive relationships and analogies, learn from experience, store and retrieve information from memory, solve problems, comprehend complex ideas, use natural language fluently, classify, generalize, and adapt new situations.
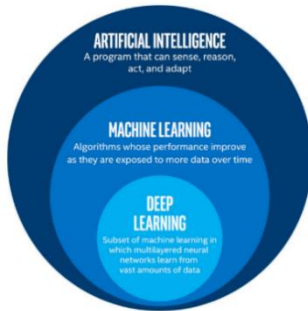
WHAT IS INTELLIGENCE COMPOSED OF?

The intelligence is intangible. It is composed of:

1. Reasoning

2. Learning

3. Problem Solving

4. Perception
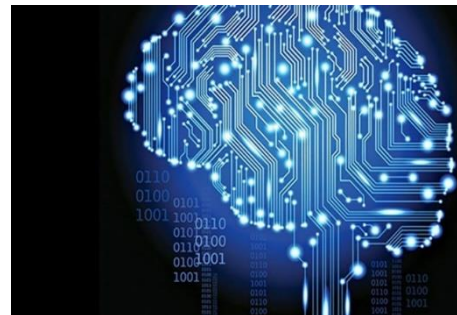
5. Linguistic Intelligence.

REASONING:

It is the set of processes that enables us to provide basis for judgement, making decisions, and prediction. There are broadly two types:

- ✓ INDUCTIVE REASONING
- ✓ DEDUCTIVE REASONING

PROBLEM SOLVING:

It is the process in which one perceives and tries to arrive at a desired solution from a present situation by taking some path, which is blocked by known or unknown hurdles.
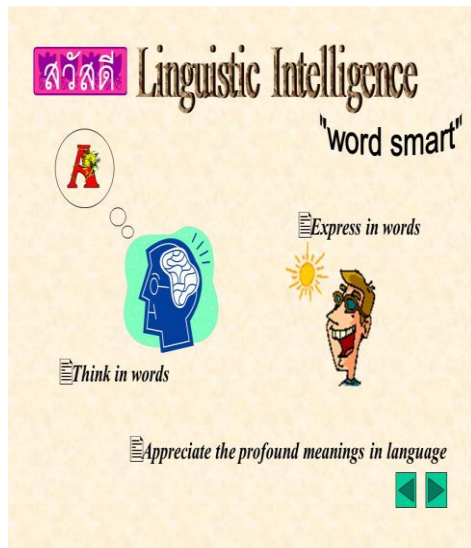

PERCEPTION :

It is the process of acquiring, interpreting, selecting, and organizing sensory information.

LINGUISTIC INTELLIGENCE:

It is one's ability to use, comprehend, speak, and write the verbal and written language. It is important in interpersonal communication.

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CONCLUSION:

Knowledge engineering is a core part of AI research. Machines can often act and react like humans only if they have abundant information relating to the world. Artificial intelligence must have access to objects, categories, properties and relations between all of them to implement knowledge engineering. Initiating common sense, reasoning and problem-solving power in machines is difficult.and tedious task. Machine learning is also a core part of AI. Learning without any kind of supervision requires an ability to identify patterns in streams of inputs, whereas learning with adequate supervision involves classification and numerical regressions. Classification determines the category an object belongs to and regression deals with obtaining a set of numerical input or output examples, thereby discovering functions enabling the generation of suitable outputs from respective inputs.Robotics is also a major field related to AI. Robots require intelligence to handle tasks such as object manipulationand navigation, along with sub-problems of localization, motion planning andmapping.Problem solving, particularly in artificial intelligence, maybe characterized as asystematic searchthrough a range of possible actions inorder to reach some predefined goal or solution. Problem-solving methods divide into special purpose and general purpose. A special-purpose method is tailor-made for a particular problem and often exploits very specific features of the situation in which the problem is embedded. In contrast, a general-purpose method is applicable to a wide variety of problems. In perception the environment is scanned by means of various sensory organs, real or artificial, and the scene is decomposed into separate objects in various spatial relationships. Analysis is complicated by the fact that an object may appear different depending on the angle from which it is viewed, the direction and intensity of illumination in the scene, and how much the object contrasts with the surrounding field.

AI research follows two distinct, and to some extent competing, methods, the symbolic (or "top-down") approach, and the connectionist (or "bottom-up") approach.

The top-down approaches seeks to replicate intelligence by analyzing cognitionindependent of the biological structure of the brain, in terms of the processing of symbols whence the symbolic label. The bottom-up approach, on the other hand, involves creating artificial neural networksin imitation of the brain's structure whence the connectionist label.The earliest substantial work in the field of artificial intelligence was done in the mid-20th century by the British logician and computer pioneer Alan Mathison Turing. In 1935 Turing described an abstract computing machine consisting of a limitless memory and a scanner that moves back and forth through the memory, symbol by symbol, reading what it finds and writing further symbols. The actions of the scanner are dictated by a program of instructions that also is stored in the memory in the form of symbols.

REFERENCE :

[1] "Artificial Intelligence: A Modern Approach" by Stuart Russell and Peter Norvig.
[2] Artificial Intelligence Elaine A. Rich
[3] Life 3.0: Being Human in the Age of Artificial Intelligence Book by Max Tegmark
[4] Logical Foundations of Artificial IntelligenceBook by Michael Genesereth and Nils John Nilsson.
[5] Computers, Minds, and Robots Book by William S. Robinson.
[6] Artificial Intelligence And Natural ManBook by Margaret Boden