ARTIFICIAL INTELLIGENCE

[CS-701]

UNIT-1 : INTRODUCTION —

Introduction to AI :-

Intelligence :- The important aspects of human intelligence seem be the following :

- → the use of intuition
- → commonsense
- → judgement
- → creativity
- → goal directedness
- → plausible reasoning
- → knowledge and beliefs

→ The meaning of intelligence is not the human brains informa processing ~~ab~~ ability but the ability of humans to demonstrate their intelligence by communicating effectively, and by learni by communicating, the knowledge that we have acquired.

Artificial Intelligence :-

→ AI means the simulation of human behavior and cognitive proces on a computer and hence is the study of the nature of the int space of the intelligent minds.

→ A key issue in this study is searching.

→ Inference is the process of creating explicit representations of knowledge from implicit ones. It can be viewed as the creation of knowledge itself.

AI : An art or a science :-

→ AI is both an art and a science.

→ A science is a body of proved principles that have been abstracted from nature through processes of ~~empirical~~ empirical inquiry and logical deduction.

→ An art is for the most part a collection of techniques, developed pragmatically to a sophisticated level, but not necessary in a logical way.

→ The field of AI is fascinating because of this complementarity of art and science. (Yazdani 1986).

→ The most important purpose of AI is to increase man's understanding of reasoning, learning and perception.

→ Better understanding is required to build new development tools and to achieve a more mature view of human intelligence than what currently exists.

Definitions of AI :- The definitions of AI can be classified into four following categories:

(1) Systems that think like humans :-

" The exciting new effort to make computers think ... machines with minds, in the full and literal sense." (Haugeland 1985)

" [The automation of] activities that we associate with human thinking, activities such as decision making, problem solving, learning ... " (Bellman 1978)

(2) Systems that act like humans :-

" The art of creating machines that perform functions that require intelligence when performed by people." (Kurzweil 1990)

" The study of how to make computers do things at which, at the moment, people are better." (Rich and Knight 1991)

(3) Systems that think rationally :-

" The study of mental faculties through the use of computational models." (Charniak and McDermott, 1985)

" The study of computations that make it possible to perceive

(4) * Systems that act rationally :-

" Computational Intelligence is the study of the design of intelligent agents." (Poole et al., 1998)

" AI ... is concerned with intelligent behaviour in artifacts."
(Nilsson, 1998)

⇒ A human-centered approach must be an empirical science, involving hypothesis and experimental confirmation.

⇒ A rationalist approach involves a combination of mathematics and engineering.

Techniques of AI :-

→ The first technique of AI is the algorithm.

→ An algorithm is a specific set of operations, procedures, and decisions which guarantees to yield correct results (Glorioso & Osorio 1980).

→ The other technique called a heuristic is a rule of thumb, trick, strategy, simplification or any other method that aids the solution of complex problems.

→ The heuristics used to solve problems in designing intelligent systems generally reduce the size of the space in which one needs to search for solutions to the problem at hand.

→ One of the differences between a heuristic and an algorithm is that while a heuristic generally aids in finding the solution, it does not guarantee an optimal solution or even a solution at all. However with an algorithm one can be sure of finding the correct result.

⇒ There are two kinds of heuristics ⟨ Special heuristic
General heuristic

Special Heuristic — one that applies to a particular problem
General Heuristic — can be applied to a wide range of problems.