Artificial Intelligence

Reference Books

1. "Artificial Intelligence" -By Elaine Rich And Kevin Knight (2nd Edition) Tata Mcgraw-Hill

2. Introduction to Prolog Programming By Carl Townsend.

3. Artificial Intelligence : A New Synthesis by Nils J. Nilsson, Morgan Kaufmann Publishers
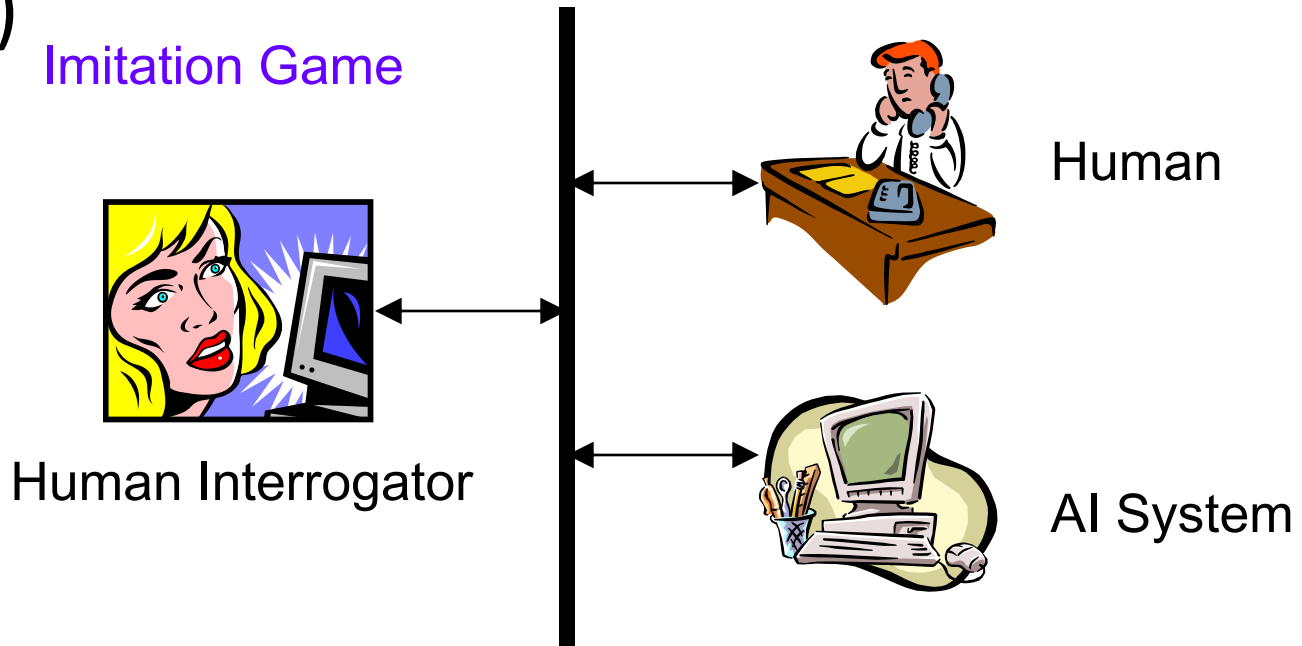
What is Artificial Intelligence ?

- Artificial Intelligence is the study of how to make computers do things which at the moment people do better.

- Artificial Intelligence may be defined as the branch of computer science that is concerned with the automation of intelligent behaviour.

The Turing Test

- Alan Turing (1912-1954)

- "Computing Machinery and Intelligence" (1950)

Imitation Game

Human

Human Interrogator

AI System

Task domains of Artificial Intelligence

- **Mundane Tasks**
  - Perception
    - Vision
    - Speech
  - Natural Language
    - Understanding
    - Generation
    - Translation
  - Commonsense Reasoning
  - Robot Control

- Formal Tasks
  - Game Playing
    - Chess, Checkers, Backgammon etc.
  - Mathematics
    - Proving theorems, Logic, Geometry, Calculus etc.
- Expert Tasks
  - Engineering
    - Design, Faultfinding, Manufacturing, Planning etc,
  - Scientific Analysis
  - Medical Diagnosis
  - Financial Analysis

What is an AI Technique ?

- Intelligence requires Knowledge
- But, Knowledge posessess some less desirable properties like,
  - Voluminous
  - Hard to characterize accurately
  - Constantly changing
  - It differs from data by being organized in a way that corresponds to the ways it will be used
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- An AI technique is a method that exploits knowledge that should be represented in such a way that:
  - The Knowledge captures generalization
  - It can be understood by people who must provide it
  - It can be easily modified to correct errors and to reflect changes in the world / our world's view
  - It can be used in a great many situations even if it is not totally accurate or complete.
  - It can be used to help overcome the data explosion problem by helping to narrow down the range of possibilities that must usually be considered

The 3 important AI Techniques

1. *Knowledge* : vital for solving a problem
2. *Search* : search the problem space for a solution
3. *Abstraction* : separate the important features from unimportant ones, so that the learning task becomes focused and is simplified