Chapt 2
Turing Test

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- ❖ **Definition of AI**
- ❖ **Turing Test**
- ❖ **Typical AI problems**
- ❖ **Intelligent behaviour**
- ❖ **Practical Impact of AI (Binto George and Gail Carmichael, 2016)**

❖ **What is AI ?**

- Artificial Intelligence is concerned with the design of intelligence in an artificial device.
- The term was coined by McCarthy in 1956.

❖ There are two ideas in the definition.

- Intelligence
  - Is it that which characterize humans? Or is there an absolute standard of judgment?
- Artificial device

❖ AI➔ about designing systems that are as intelligent as humans.

❖ AI➔ best embodied by the concept of the Turing Test

❖ Rooms, A and B. One of the rooms contains a computer. The other contains a human. The interrogator is outside and does not know which one is a computer.

A

B
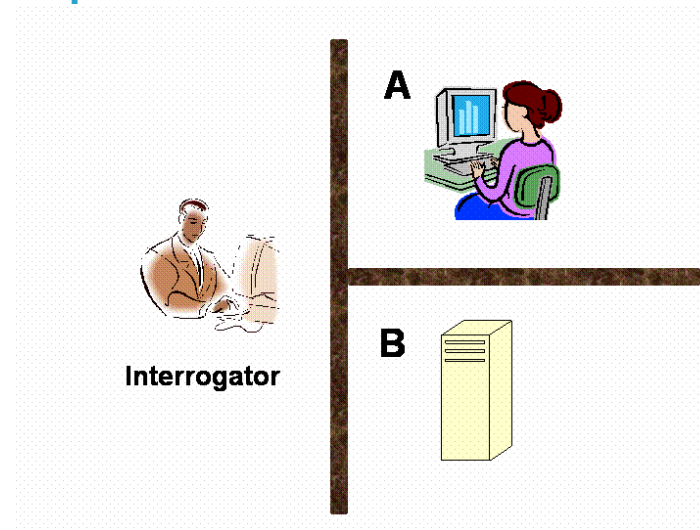
Interrogator

❖ To pass the Turing test, the machine has to *fool* the interrogator into believing that it is human.

❖ Examples of common-place tasks include
- *Recognizing* people, objects.
- Communicating (through *natural language*).
- *Navigating* around obstacles on the streets

❖ Expert tasks include:
- Medical diagnosis.
- Mathematical problem solving
- Playing games like chess

❖ Some of these tasks and applications are:

- Perception involving image recognition and computer vision
- Reasoning
- Learning
- Understanding language involving natural language processing, speech processing
- Solving problems
- Robotics

"If you have ever checked the news, weather, take a picture with your smart phone, or even just used social media e.g., facebook, twitter for information online, you have used Artificial Intelligence (AI). "

Dr.RK

❖ Modern applications of AI range from computer games to self-driving cars.

❖ Financial institutions use AI for fraud monitoring, investment decisions support, credit risk assessment, data mining of customer behaviors, and economic forecasting.

❖ The military uses AI for target discrimination, missile defense shields, and robot steering.

- ❖ AI method used for gaming, cryptographic code breaking, freight routing, data packet routing, market prediction, hardware design, signal filtering and signal processing.

- ❖ Genetic algorithms have origins in evolutionary biology, in which organisms evolve and adapt to thrive in environmental conditions. Learn more about genetic algorithms and evolutionary computing (Chapt IV)

❖ Learning from experience is a sign of intelligence.

❖ Neural networks simulate the learning capacity of biological neurons in our brain.

❖ Neural networks can be effectively used for gesture recognition, speech recognition, handwriting recognition, fraud detection, cancer cell detection and petroleum exploration, and much more.

❖ In particular, big data systems handle huge volume and variety of data moved at extremely high speeds, where conventional data processing methods are not sufficient.

❖ Neural networks can predict patterns or devise processing strategies to sufficiently deal with big data (Chapt V)

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- ❖ Expert systems can assist or even replace human experts with specialized knowledge.

- ❖ Expert systems for disease diagnosis include MYCIN (Shortliffe, 1977)

- ❖ DENDRAL (Lindsay, Feigenbaum, Buchanan, & Lederberg, 1980) is used for the identification of the structure of chemical compounds.

❖ Expert systems may also be used in auditing, taxation and accounting.

❖ One type of expert system, called a fuzzy expert system, is used for avoiding automobile collisions, auto-piloting airplanes, controlling Unmanned Area Vehicle (UAV), detecting cancer, diagnosing heart disease, evaluating insurance fraud, and predicting credit risk (Chapt VI)

❖ Digital assistants such as Siri®, AlexaTM, CortanaTM can also interact with us using natural language. (Chapt VII) describes how we can implement natural language processing on a computer.

❖ **Thank you**

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