

Artificial Intelligence

Thinking Humanly

- Machines with minds
- The automation of activities that we associate with human thinking, activities such as decision-making, problem solving, learning

Thinking Rationally

- The study of mental faculties through the use of computational models
- The study of the computer that make it possible to perceive, reason and act

Acting Humanly

- The art of creating machines that perform functions that require intelligence when performed by people.
- The study of how to make computers do things at which people are better

Acting Rationally

- Computational Intelligence is the study of the design of intelligent agents.
- AI is concerned with intelligent behavior in artifacts

Acting Humanly : Turing Test Approach

The Turing Test (Alan Turing 1950) was designed to provide a satisfactory operational definition of intelligence

A computer passes the test if a human interrogator after posing some written questions, cannot tell whether the written responses come from person or from a computer.

- Natural language processing
- Knowledge representation
- Automated reasoning
- Machine learning

Turing test deliberately avoided direct physical interaction between the interrogator and the computer, because physical simulation of a person is unnecessary for intelligence.

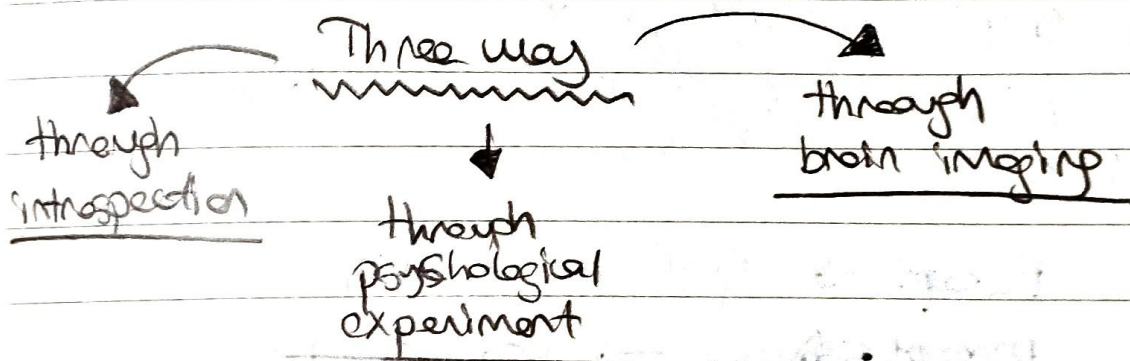
Total Turing Test includes a video signal so that the interrogator can test the subject's perceptual abilities as well as the opportunity for the interrogator to pass physical objects "through the hatch".

• Computer vision
• Robotics

• Artificial intelligence

Thinking Humanly: The Cognitive Modelling

We need to get inside the actual workings of human minds.



Acting Rationally: Rational agents approach

Agent is something that acts. Computer agents are expected to do more: operate autonomously, perceive their environment, adapt to change, create and pursue goals.

Rational agent is one that acts to achieve the best outcome or when there is uncertainty, the best expected outcome.

Discrete
symbol

Thinking Rationally: laws and thought

Logical Thinking / Logicist

— INTELLIGENT AGENTS —

An **agent** is anything that can be viewed as perceiving its **environment** through **Sensors** and acting upon that environment through **actuators**

Human agent has eyes, ears, and other organs for sensors and hands, legs for actuators

Robotic agent has cameras, infrared sensors, trip sensors for sensors and motors for actuators

Software agent has keystrokes, file contents, network sensor and packets for sensors and monitors, keyboards for actuators

Percept → agent's perceptual inputs

percept sequence → complete history of everything the agent has ever perceived.

