- **AI Perspectives: Acting and Thinking humanly, Acting and Thinking rationally**

In order to design intelligent systems, it is important to categorize them into four categories (Luger and Stubberfield 1993), (Russell and Norvig, 2003)

1. Systems that think like humans

2. Systems that think rationally

3. Systems that behave like humans

4. Systems that behave rationally

	Human- Like	Rationally
Think:	Cognitive Science Approach *"Machines that think like humans"*	Laws of thought Approach *" Machines that think Rationally"*
Act:	Turing Test Approach *"Machines that behave like humans"*	Rational Agent Approach *"Machines that behave Rationally"*

Scientific Goal: To determine which ideas about knowledge representation, learning, rule systems search, and so on, explain various sorts of real intelligence.

Engineering Goal: To solve real world problems using AI techniques such as Knowledge representation, learning, rule systems, search, and so on.

Traditionally, computer scientists and engineers have been more interested in the engineering goal, while psychologists, philosophers and cognitive scientists have been more interested in the scientific goal.

Cognitive Science: Think Human-Like

a. Requires a model for human cognition. Precise enough models allow simulation by computers.

b. Focus is not just on behavior and I/O, but looks like a reasoning process.

c. Goal is not just to produce human-like behavior but to produce a sequence of steps of the reasoning process, similar to the steps followed by a human in solving the same task.

Laws of thought: Think Rationally

a. The study of mental faculties through the use of computational models; that it is, the study of computations that make it possible to perceive reason and act.

b. Focus is on inference mechanisms that are probably correct and guarantee an optimal solution.

c. Goal is to formalize the reasoning process as a system of logical rules and procedures of inference.

d. Develop systems of representation to allow inferences to be like

"Socrates is a man. All men are mortal. Therefore Socrates is mortal"

Turing Test: Act Human-Like

a. The art of creating machines that perform functions requiring intelligence when performed by people; that it is the study of, how to make computers do things which, at the moment, people do better.

b. Focus is on action, and not intelligent behavior centered around the representation of the world

c. Example: Turing Test

- 3 rooms contain: a person, a computer and an interrogator.
- The interrogator can communicate with the other 2 by teletype (to avoid the machine imitate the appearance of voice of the person)
- The interrogator tries to determine which the person is and which the machine is.
- The machine tries to fool the interrogator to believe that it is the human, and the

person also tries to convince the interrogator that it is the human.

- If the machine succeeds in fooling the interrogator, then conclude that the machine is intelligent.

Rational agent: Act Rationally

a. Tries to explain and emulate intelligent behavior in terms of computational process; that it is concerned with the automation of the intelligence.

b. Focus is on systems that act sufficiently if not optimally in all situations.

c. Goal is to develop systems that are rational and sufficient

- ## History of AI