

S760 Philosophy of Psychology

Intelligent computers

There are engineering, philosophical, psychological, science fiction and ethical consideration behind the concept of Artificial Intelligence (AI). For this reason, sometimes it could be better only to examine what AI really does, instead of asking us, for example, if to solve problems means that computers can think and so to be intelligent. According to this point of view, the best definitions of AI are probably the following: Minsky (1968) claims that:

“...artificial intelligence is the science of making machines do things that would require intelligence if done by men”;

Rich and Knight (1991) affirm:

“AI is the study of how to make a computer do things which, at the moment, people do better.”

The following points can help us to understand in what, computers and human brain, are similar:

1. Both, computers and brain, can be viewed as processors of information. In fact, they take inputs from various sources, transform and manipulate them, and at the end they produce outputs.
2. Both can be described as achieving their diverse results by combination of many similar elements performing simple functions. In computers, electrical cells get switched on and off. In brain, nerve cells are excited or inhibited.
3. Both computer and brain can be seen as general purpose devices. They can perform many different operations with the same hardware.
4. Both can store and use large amounts of information.
5. Both might be said to follow organised plans for action.

At this point we have to make an important distinction between two different ways to program computers: 1) conventional programmes and 2) AI programmes.

The first can carry out only recursive problems, they have not any representation of knowledge, any strategies of problem solving, they cannot change the structure of the program when it is already installed. AI programmes take care of all, and only, the tasks that the conventional ones are not able to carry out. “Only”, because conventional programmes are much more efficient, they reach always the best solution and they require less effort to be formulated (then they are also cheaper). The difficulty is that a lot of problems are not recursive and cannot be reduced in an algorithm, as a medical diagnosis or a verdict in a trial. This kind of tasks can be solved only with a AI programmes. Moreover, part of the recursive problems could require from the hardware, practically infinite capacity of calculation, that it is obviously impossible. It is the case of exponential problems as in the chess play or in the meteorological prevision.

Human beings are able to solve this kind of problems because they use heuristics strategies, reasoning and common sense. Artificial Intelligence’s aim is this: to transfer these informal strategies inside an automatic formal system to solve all the following tasks:

Mundane tasks

1. perception

2. natural language
3. commonsense reasoning
4. robot control

formal tasks

1. games
2. mathematics

expert tasks

1. engineering
 2. scientific analysis
 3. medical diagnosis
- financial analysis