To define what intelligence for a machine is, Turing introduces an “imitation” game. If we replace a human being with a machine and do not let other players know that, we can say that machine has intelligence if other players feel it(the machine) behaving as a normal human being. This is called the Turing Test. To make the machine more specific, Turing defines the digital machine which manipulates the binary number 0 and 1 and uses simple rules to rewrite in memory. The reason why using digital machine is that it has already been invented at that time and it is universal. Then he points out nine objections which are against the AI. Thinking of God’s power and the fear from being replaced by AI are not scientific way of this problem. To argue against the mathematical objections, Turing suggests that human are not always right and often pleased at the fallibility of a machine. From the consciousness’s aspect, Turing says that each individual can only say one has experiences emotions by oneself and we cannot judge others. For the disabilities, Turing thinks there is no support or in the future with more advanced technology it will do. For Lady Lovelace’s objection, Turing argues that the AI’s surprises are not immediately recognizable. From the aspect of nervous system, Turing argues that any analog system can be simulated to a degree given enough computing power. For informality of behavior, Turing says if we cannot immediately see what the behavior laws are, we cannot say there is no such laws exist. For Extra-sensory perception, Turing gives ESP the benefit of the doubt to argue that. At the end, Turing also speculates how to design a machine that can pass the Turing Test.

Comments:

In my childhood’s memory, AI is a cool and fashionable word in movies and science fictions. However, after I have studied some modules of computer science, I realize so-called “AI” is just sets of algorithms and their implementations. After reading through the paper, I get the judgment for AI which is the Turing Test. My thought is, in a very small area or field, the nowadays’ programs have intelligence. For example, we can code a program, if we input 1, it prints ONE; if we input 0, and it prints ZERO. If we ask a human being to do this, he or she can also do it. Then the behaviors for both human and the program are the same. So, in certain small areas, machine really has intelligence. However, unlike biological intelligence, AI’s intelligence needs people’s idea or algorithms. Even if machine can learn, it also reuses the idea of human beings and their learning algorithms are programmed by human beings. This is the difference between machine’s intelligence and biological intelligence. I wonder that, if we supply enough algorithms to an enough space machine, can it behave as a normal human being. Say the talking robot, if we code it when it will have emotions (give it a certain personality) and when having emotions what they should do and give a huge database to store the words and how to use words, will it talk like a human? If we do not think they are robots before talking, maybe we will treat it as a normal human being.