Artificial Intelligence: Search Methods for Problem Solving
Prof. Deepak Khemani
Department of Computer Science & Engineering
Indian Institute of Technology, Madras

Lecture – 05
Introduction (2013)
The Turing Test

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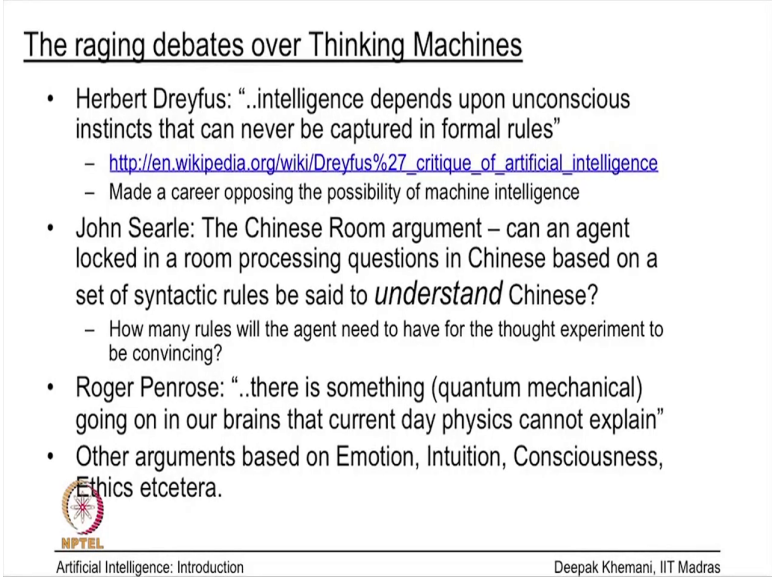

Let us look at the argument by philosopher John Searle, it is called the Chinese Room Argument. He says can an agent locked in the room processing questions in Chinese based on a set of syntactic rules be said to understand Chinese? So, it is a thought experiment which John Searle proposes. It is a very famous argument, just look up the Chinese room argument on the web and you will get all these descriptions.

So, the idea is that supposing you as an English speaking person or whatever Hindi or Tamil speaking person, were locked up in a room and you were full of these slips of paper which have the syntactic rules, which say if you see this pattern, then send out this response; if you see this pattern, then send out this response ok. You do not know what that thing is about.

You see some patterns and you have been instructed to map do match a pattern and send out a response based on that and you know, there is somebody from outside below the door slipping, sending you slips of paper with some patterns, then you make some other patterns on slips of paper and send them back essentially. You do not know what your what is happening; what it turns out apparently at the end of this is that somebody is asking you questions in Chinese and you are giving them answers in Chinese.

So, John Searle says and this is this Chinese Room Experiment, thought experiment says that supposing this were to happen, would you say that the person who is answering you was Chinese and he says no because the way that experiment has been described and he says that therefore, but his behaviour looks like intelligent behaviour, because he is giving you all the answers. But is that real intelligence, he says no essentially. And of course, there is a little bit of an operational trap there, which is what I have written here.

How many rules will an agent need to have for the thought experiment to be convincing essentially and we will see this idea again in a different form as we go along ok. One more objection from the celebrated mathematical physicist John Roger Penrose, you must have heard about him also a Nobel Laureate; he wrote this book which became quite a hit essentially, it was called ‘The Emperor’s New Mind’ essentially hm.

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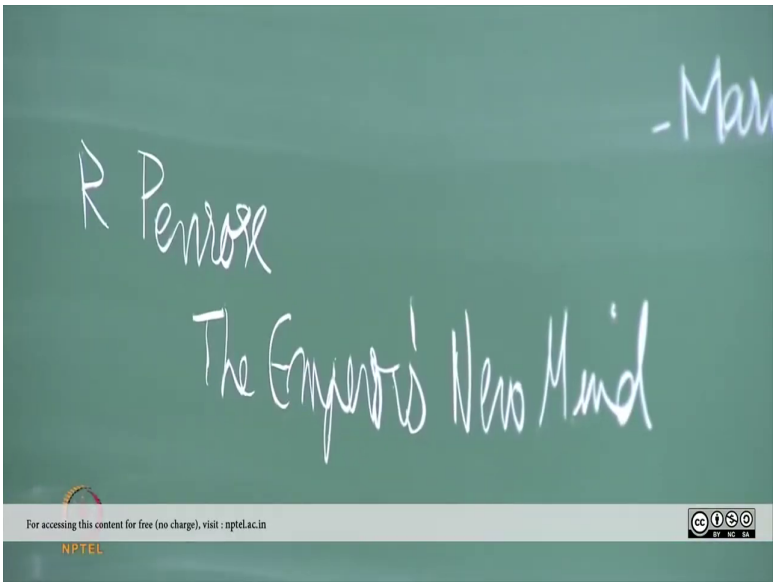

If you write the name you know. So, Penrose's The Emperor's New clothes and he is also asking this question about can one be can machines think or not? His answer is that no machines cannot think, we are the only thinking creatures and he says that there is something happening in our brains which current day physics cannot understand, cannot explain essentially and that is something he says it with respect to quantum mechanical.

If you want to go into those details, you should look up the web or read his book essentially which is not so easy to read; but still he wrote a later book, I forget it is name which is a shorter version of this book. So, that is another argument. Then, there are arguments like he mentioned Emotion, Intuition, Consciousness, Ethics. So, some people say it will not be ethical to have intelligence machines. So, they cannot be; so they cannot be intelligent.

Now, this is kind of a roundabout argument which says it would be bad for I do not know who. So, we cannot have an intelligent machine obviously; of course, we are very ethical people and we go around suspending 28 year old IAS officers because of some small prejudice that we have against him. So, there are many arguments which occurred initially and there have been many counters to the argument which I have not talked about because we want to get on to what Turing said right.

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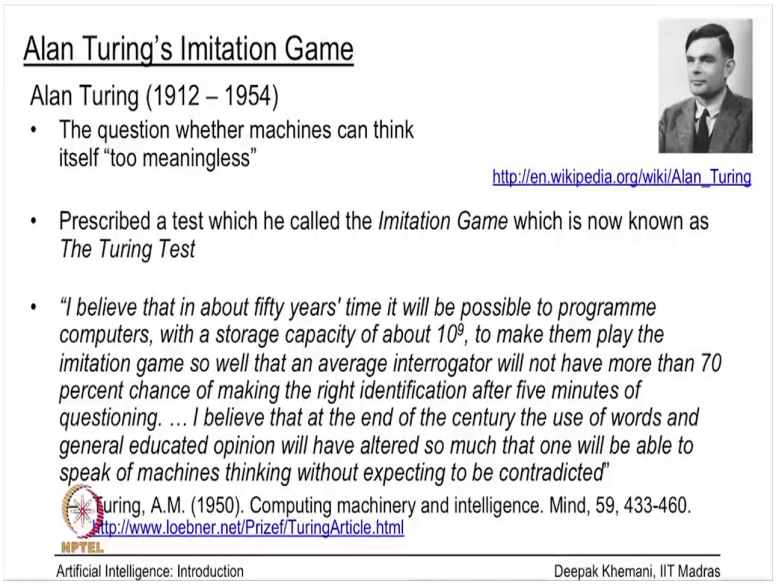

So, you all know Alan Turing, he was very instrumental in cracking codes during world war, this thing. What he says that he would have been 101 years old, if he were alive today right. What he says last year was his birth centenary and a lot of things were going on. He said that the question whether machines can think is just a meaningless question because we are not

able to even describe it, we made an attempt here to say what is thinking, but it is not very clear to say what is thinking.

I mean IQ tests and things like that are of course meaningless essentially. As is I guess JEE and SAT and something. What he did was that let us not get into this raging debate of can a machine think or not. He says I will give you a test which he called as the Imitation Game which we will see in the next slide, which is now known as the Turing Test and nothing to do with Turing machines. Of this, he says about this Turing Test, we will see in a moment.

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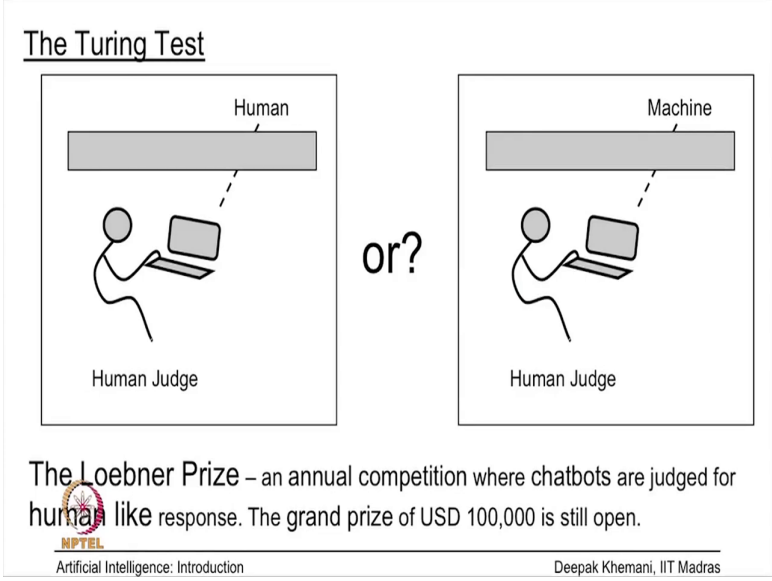

Or let us first see the test and then, come back. The Turing test is like this that there is a human judge. Now, this something has happened to this. Anyway, there is a human judge sitting on in those is a teletype in current day world, maybe on a mobile phone chatting with

someone. So, you are chatting with someone, you type in something and somebody else types back something and so on and so forth.

So, he imagined that teletype connected to a machine on the other side; but there is a wall in between. So, you do not know whether it is a machine or whether it is a human being over other side and what Turing said was that if he gave a figure like 70 percent of the time, the machine can fool the judge into thinking that the judge is talking to a human being; then, the machine is intelligent essentially.

Now, we will come back to the test again. So, what did Turing feel? He felt and this was in 1950 when he wrote this paper called computing machinery and intelligence, it is available on the web. If you go to many places, you will just get the paper directly. He says that in about 50 years of time which is 2000; in year 2000, it will be possible to program computers with a storage capacity of 10 raise to 9. So, 10 raised to 9 was considered to be a big number and history is replete with these kinds of examples right. Bill Gates, apparently had once said that who on earth will need memory more than 64 K essentially.

So, he said that with a capacity of 10 raise to 9 to make them play the imitation game, the game that we just described, so well that an average interrogator will not have more than 70 percent chance of making the right identification after 5 minutes of questioning and then, he says that I believe that the end of the century which is at the end of 50 years, use of words and general educated opinion will be altered so much that one will be able to speak of machines thinking without expecting to be contradicted essentially.

It is very difficult to make predictions in these kinds of matters David Levy said that no machine can beat him. Alan Turing says that all machines the machines will routinely pass the Turing test, both were wrong in the sense, that we still cannot say that you know we have machines which pass the Turing test. So, currently there is something called a Loebner Prize which has been instituted by a guy called Loebner as the name suggests. It is an annual competition, where chatbots are judged by for human like response.

So, it is not as if you are fooling something; but for human like response and there is a grand prize of 100,000 dollars, if in case you are interested in some pocket money; I mean say in its still open essentially. So, there are two; so, there is a question which I want to ask of you. We do not have too much time, we will have to stop soon and we will start with this in the next class, is to what do you think of the Turing test, as a test of intelligence remember?

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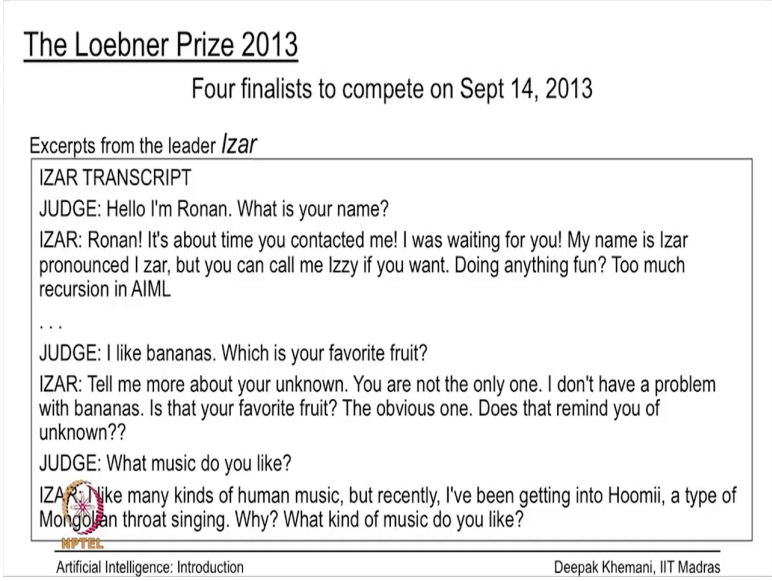

Now, he himself said that do not talk about thinking and all, but just accept this test. Let me just show you some examples of this year's competition, which I got from the web. So, this year there are four finalists who are going to compete on September 14. These finalists have been selected based on some earlier rounds and this is a transcript from the leader of those four, the best known. So, let me just read it out.

So, there is a judge and there is this program called IZAR. So, the judge says ‘Hello, I am Ronan that is the name of the judge. What is your name? The program responds and just try to imagine how would you write a program which would respond like this; this is this is a output of this program which is called IZAR.

It says ‘Ronan, its about time you contacted me. I was waiting for you. My name is Izar, pronounced I zar, but you can call me Izzy if you want. Doing anything fun? Too much recursion in the AIML’ and so on and so forth. Judge says at some later point, I have just not I have not given you the full this thing. ‘I like bananas. Which is your favourite fruit? He says tell me more about your unknown. This is a trick which the program is employing to answer a question which is it cannot answer very easily. ‘You are not only one’.

So, you have to build in these kind of tricks; human beings also do that, if you are taking a viva about something you know. ‘I do not have a problem with bananas. Is that your favourite fruit? The obvious one is one. Then, he says I have been getting into Hoomii, a type of Mongolian throat singing. So, you have to put in certain amounts of knowledge in your system to be able to convince the (Refer Time: 11:10) ok. So, he is trying to impress other way.

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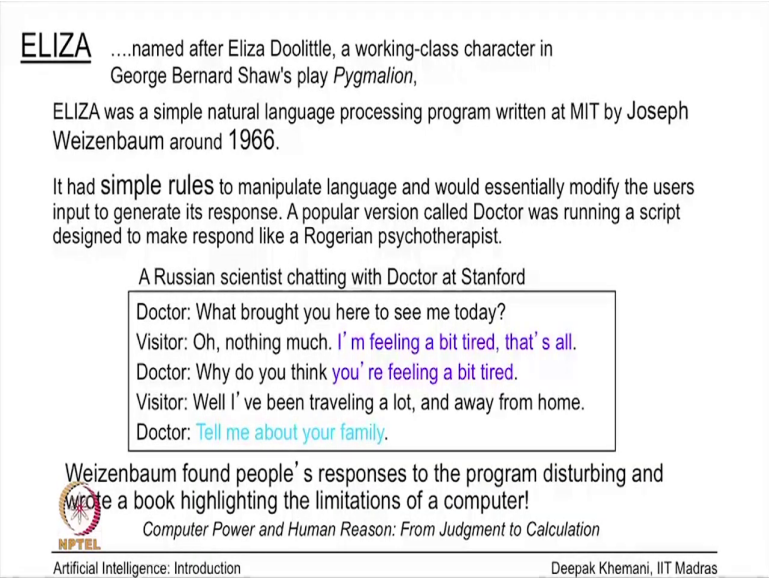

So, let me leave you with a program which was written in 1960 or something. This program is called ELIZA, you must might have heard about it. It was named after Eliza Doolittle, who was a character in Bernard Shaw's play called Pygmalion and we will we will visit Pygmalion again later.

It was a very simple NLP program written at MIT by Weizenbaum in 1966, it used simple rules to manipulate language. It would read what the user has written, manipulate it little bit and throw it back. So, it says if you go and say for example, the somebody will say; so, for example, if you were to say Oh, I like bananas, it would simply say why do you like bananas?

So, it will just twist that and send it back to you and then, a popular version is called Doctor which I am sure, you might have seen; it runs a script which makes it looks like a psychotherapist essentially, which of course, makes it easy to ask questions. So, it can always

one of the standard questions, these program ask is Tell me more about your family? You know if they cannot say anything else, then say tell me more about your family and as a human being, you would say oh this program is doing some deep analysis (Refer Time: 12:28). So, here is a Russian scientist, who was visiting Stanford, who was running a version of this. So, just read this.

Student: (Refer Time: 12:45).

So, I have coloured those things to show you that you know it is just twisting that sentence, in this thing. So, these are this is. So, there was a scientist apparently, after this conversation he started pouring out all his woes to this program and so on and so forth. And Weizenbaum found that his secretary was all the time talking to this program and apparently, she was quite furious when she found out that Weizenbaum had access to those conversations essentially (Refer Time: 13:16).

And nowadays of course, you know prism and everything. Weizenbaum actually found that peoples responses were so disturbing that he wrote a book which says that no, no computers cannot do all these kind of things essentially.

So, we are gullible and I think, we will take it up in the next class with some even older examples of how we look at something and we believe that it is doing something in the intelligent for us essentially. Meanwhile, I would like you to think about this Turing test. In the next class on Wednesday, we will start discussing what we think about the Turing test essentially.

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Language and Thought