ARTIFICIAL INTELLIGENCE
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Lecture – 3
Introduction: History of AI in the 90s - Part 3

So, with all this crazy time with nothing getting achieved no success what so ever and so on, we finally got our first success.

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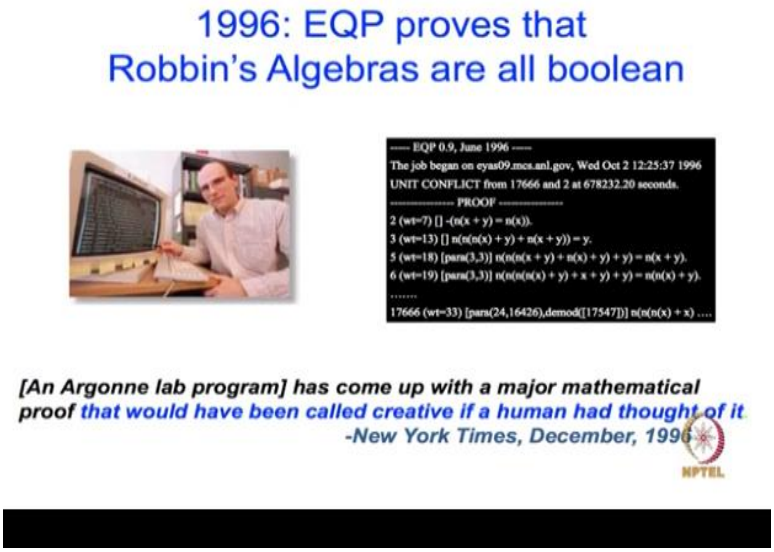

And the first success was in 1996. An algorithm called EQP proved a theorem which was always believed to be true as a conjunction but we did not have a proof that was a many success for ever because remember the logic theorem started way back in you know 50s and what is very interesting also is how the press reported it. So for example, New York Times said that an Argonne lab program has come up with a major mathematical proof.

So far so good, that would have been called creative if a human had thought of it. Notice the reluctance in calling the machine creative, notice the reluctance in thinking of the machine as an intelligent being not being a device or whatever, so this way of looking at the world stayed. Because in 1997 what was the main event I am going to look at now, somebody known success of AI 1997? CNN Paper you guys are too narrow minded you know.

When was the first time CNN actually showed promise? 2012 we are in 1997 CNN may have been written just about there you know 1997 or something, but that is you cannot call it a success then. What is the AI success in 1997? Chess should look at your some history.

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Deep Blue after so much time of claiming that we can defeat humans in chess finally defeated the Grandmaster Garry Kasparov. Now this particular comment from CNN is actually funny because deep blue predecessor was called any guesses? Deep, I cannot tell you thought, so deep thought was deep blue predecessor and that was not able to defeat Garry Kasparov at the time, so therefore, this you know, title is funny.

Deep Blue was seen as some cunning computer which is known quote, unquote killing humans in chess and they many things I want to say about this. First thing is offcourse 1996 there was a deep blue was a huge supercomputer for one move all the supercomputer was running and evaluating and figuring out what is the right move, it was made by IBM. There was at competition in 96, which Garry Kasparov has defeated, deep blue 42.

So Garry Kasparov was very confident of course, IBM guys improved it and they had a rematch in 97 and deep blue 13.5 to 2.5 it is close match. It is Garry Kasparov said that I could feel human-level intelligence across the room. This you can say if your machine is terrible than

humans, because at some point it is possible that machine overtakes humans and then by saying that machine, you have a human-level intelligence is a bad compliment.

At the time, this was the first demonstration of the machine beating humans in chess. But now do we have a single human who can defeat the best machine in chess? No in fact, in a few years, even a single victory in a long series of games would be a triumph of human genius, that human now has machine level intelligence in chess and that is something that we will also work with that intelligence is not a 01 phenomenon there are degrees of intelligence. Now many other interesting things happened and we will stop after this slide.

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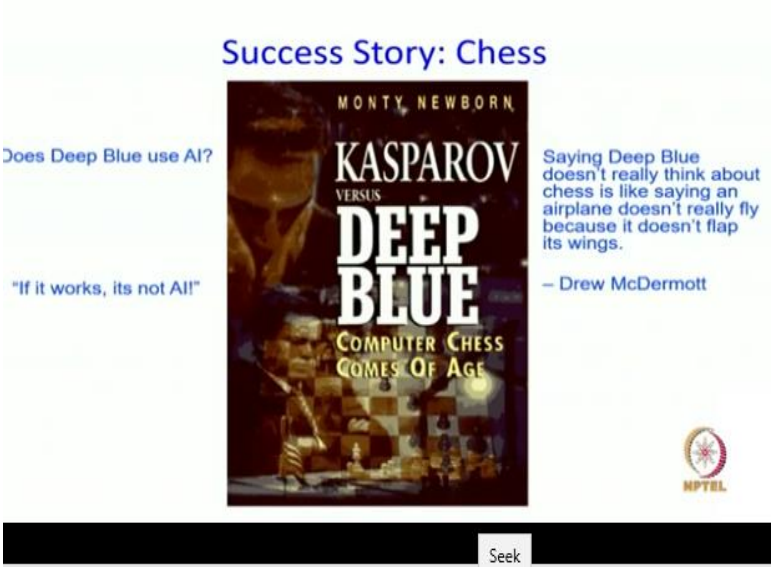

It was questioned whether deep blue really uses AI or it is this one specific algorithm called the heuristic search mini max algorithm with heuristic evaluation function is it really AI and that was very complicated a question? Because a lot of people thought that is not intelligence, that just some search algorithm and of course, any algorithm will be some algorithm, whatever you put in as your intelligence algorithm will be some algorithm.

And the human will say that is not intelligence that is just algorithm x. So one of the senior researchers of AI Drew McDermott at the time responded by saying that saying deep blue does not really think about chess it is not intelligent about chess, is like saying that an airplane does not fly because it does not flap it is wings, where we getting the job done maybe different way of

getting the job done. It may not be intelligent, like the way humans are intelligent, but it is still intelligent.

And that led to the phenomena and it is a very famous sentence if it works, it is not AI we have to stop because we are out of time. So I will pick up some here tomorrow and we will discuss why do people say if it works it is not AI why does AI principle never why does it never work? so we will talk about that starting tomorrow. Let us get started so, this is where we were in after last class, we were talking about history of AI.

We started talking about the fact that you know, in some ways AI can be thought of as starting from during a paper which asks can machines think later the AI as a field got develop, and it went through various phases where sometimes the AI was doing really well and bringing in a lot of money, bringing in a lot of energy and then suddenly AI went down because of some reports of various other market forces playing into the picture and AI had its winters.

Until then, we had not really had a success story and AI a researchers was sort of started to getting branded as people who claim but do not deliver and the one first change as we talked about happened when theorem got proof, which was believed to be true by everybody more or less, but there was no proof available and a machine rude and then later then, a year later when the Garry Kasparov was actually defeated by IBM, deep blue in the game of chess.

Notice that chess itself had a long history of this prototypical intelligence application. Because even in the olden days, there was you know, mechanical device which was playing chess, do you know what it was called? Mechanical Turk and the people got really amazed as to what is happening and how is this machine playing chess so well and then later it was found that there was a person hidden inside the big machine and he did not he his height was quite short.

So you know, he was he could squeeze inside a small place and that person was actually playing chess and from there, the word mechanical Turk came into the picture and now you have heard of mechanical Turk in a different context, which is Amazons mechanical Turk, the idea of crowd

sourcing; we will talk about that later, at some point may be so, chess was this one application, which was considered the intelligence application for many, many, many years.

Ever since very early in the 50s they were saying we will defeat humans in chess offcourse, that have only happened 40 years later and when this happened once after this happened, there was a question of is deep blue a really an AI system or is it like some brute force search system, which is just searching all possible plays and parts of game play and then making a decision on which is the best and if so, is it really an AI system and that led to the question, famous statement if it works, it is not AI.

Let us think about this for a minute because we as AI researchers, except for the last 4 or 5 years, have looked at this statement and you know, sort of thought to each other, can you really succeed can AI ever work because as soon as something starts to work, they say it is not a it is the algorithm x, whatever that algorithm be and the more you think about it, the more you will start to observe why this happens.

So, let us go back, you know 120 years and 140 years and let us say we want to build an intelligent door, at door which has intelligence in it, what is this kind of a door? As soon as somebody wants to walk through the door automatically opens. This is this is the thing of science fiction maybe 120 years ago that we will have this building where the doors will be so intelligent that they will remain closed except when somebody wants to walk through and then they will magically open up this feels like magical at the time.

At the time, you have to really go back but now we know it is just a motion sensor. Now, as soon as I said it is just a motion sensor I am taking this beauty, full dream in your brain in your mind that the door will magically open and I am creating a very real technology solution for it and saying look this is not that magical it is just a sensor which does, which operates in this way. Now, as soon as you see this, you will be you will say, yeah, that is pretty awesome I had this beautiful dream, the doors are magically open.

Now we know how to make them make that open and the next day, will you feel the same kind of magic in doors automatically opening? Because now you know what, how it works. So somebody said this very beautifully they said that with deep understanding, comes a deep sense of loss and it takes you some time to even you know, over time in life to appreciate this, that there is something that works something that you are amazed about how can they do it and then suddenly, you understand it and once you understand, it is just this algorithm.

That they are following and once you know, it is that the algorithm they are falling once you have understood it, it does not feel magical anymore and your goal for life, if you are the person who is working on building intelligence, you say, I thought this was my goal but this we can do with this, this, this is no big deal. Let us work on that next thing which we cannot do today that is what real intelligence it.

So what keeps happening is that as you achieve a goal post, your goal post shifts and you feel like what you have achieved is no longer quote unquote intelligence, because it is just a very specific demonstration of it in this context and has a specific algorithm. But it is the next thing that you do not know what to do that magic is still intact, because you do not know what to do so because of this constantly moving goal posts nature of intelligence.

How we perceive intelligence? We start to say if it works, you know how it works, and if you know how it works, it is not intelligent anymore. It is not AI, the AI is the next thing that does not work and so we have constantly grappled with this as AI researchers, because as soon as we have AI solution, the first time we have a solution, it is awesome, then we look at the solution is, whatever we will move on this also happens to you by the way.

When you learn a theorem, for example, let us say it is an unusual theorem your professor taught you very well, they gave you the proof you were like, wow, is not that so cool and weeks down the line, what is it? It is just the sequence of steps that led you to this particular proof, you have now understood the sort of the beauty and the magic of it is sort of gone and now it is the next term that you do not know how to solve.

So this kind of phenomenon happens again and again, but in the field of AI this sort of happened with the field itself, because as soon as somebody said, this is the AI they said no, this is algorithm x, that is AI one that you do not know how to do therefore the sentence if it works, not AI which is also good because we will always be in the job. Whatever we do, we have not solved a problem the problem is the next problem to solve so you will never be out of jobs.