

Artificial Intelligence

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Abstract

Artificial Intelligence is study and design of machines and design of intelligents, where intelligent agent is a system tool which prevents its environment and takes actions which maximize its chances of success.

This paper throws light on implementing the artificial intelligence to the word processing and the word editing software. This can be accomplished by teaching the machine, both the logic & sense that we possess over the language. It is a very tedious job. Yet it can be achieved through the concept of "Patternisation". It means that the language is stored as set of rules and regulations, so that the machine can automatically generate its own sentences and also can easily identify the incorrect ones. This is a key concept which is going to make the ultimate dream of humans (AI) come true. These ideas are purely unique. This is a research work.

Introduction

It is artificially imparting the intelligence of humans to the machines, so that they can learn and act by themselves like us. Major AI textbooks define the field as "the study and design of intelligent agents", where an intelligent agent is a system that perceives its environment and takes actions which maximize its chances of success.

AI has become the major plot for the fiction writers since the start of the research. Particularly in the field of ROBOTICS, AI finds its applications to be extraordinary. Generally the fiction works are more exposed than the reality about the AI. In contrast to fiction, AI has been stuck up in a basic level problem which is strong enough to get its hold until it is solved properly. Apart from this hold, it has its development jailed by many other problems of the previous breed which is not going to let many generations enjoy the AI.

In short, we can simply say that it is almost impossible to replicate the actions of *HUMAN BRAIN* artificially using the range of machines present now. The central problems of AI include mostly Brain involving activities such as *Reasoning, Knowledge, Planning, Learning, Communication, Perception and the ability to move and manipulate objects*. *General intelligence* is the most typical part to impart.

Problems of AI

We have almost picked all the basic level problems to develop AI. The basic level problems are emphasized because there is never a strong building without a

good basement. Let's discuss all the materials required for a good basement of AI.

Basic Problems

Lack Of Sense:

AI uses computers because they are the best available tool, not because they are the object of study. Now let's discuss the problems keeping the MS-WORD's "Autocorrect" option as the plot. This highly famous option has never reached the people as a basic and efficient tool of AI. Coming back to the problems, the chief problems are concerned with the language. The stop is in making the computer to understand the language. We can program the entire language to the machine but can not make them understand the language. Let us consider the following situation: We have programmed the entire English grammar in a computer with entire grammatical rules and regulations. Now let us see how the computer reacts to the following sentences.

1) Cat ate rat

2) Rat ate cat

If we instruct the computer to check the correctness of the two sentences, the computer will surely give out that the two sentences are correct. This is a big drawback. We humans can easily sort out that the second sentence is grammatically correct but not sensibly. Because of the sense that we possess we can understand that the sentence is wrong, but it is merely impossible to program that sense to the machines. This is where computers are one step behind the humans.

For the present time being we have not yet solved this problem even for the phrases.

Example

- 1) Leave bus
- 2) Leave letter

So far, Scientists could not program the machine even to find the difference in the grammatical sense of the above sentences. It is very crucial for a machine to understand the sense in the language.

Now let's consider the third example.

- 1) It is midnight.
- 2) It is dark.

These 2 sentences are correct. But the problem peeping out is that the computer cannot understand the coherence between these 2 sentences. Machines totally ignore that these 2 sentences have some connection between them.

This leads us to a point that machines do whatever they are programmed to. They don't understand and do. They simply convert the user data into processed output.

Intelligence

Intelligence is the linking of present events with the experience and coming out with new ideas. Humans naturally possess this ability. Our task as discussed above is imparting this ability artificially to the machines. I am mentioning this again because there is a point to note down. The "Linking process" is the key. Let us consider this example:

I saw TOM& _____.

Ans: ?

Your mind would have answered in a fraction of second that the answer is JERRY without any hesitation. Ya. This is intelligence. It becomes possible for us to do this because of this simple mechanism. As soon as brain receives a question, it searches the records saved in it. There is memory of size more than 1TB in the brain. In a fraction of second our brain finishes analyzing all these huge data and finds the answer by linking the given question to each possibly related data. This is the mechanism.

Having analyzed the brain mechanism, let us discuss whether it is possible to achieve this mechanism in the machines.

Consider our two eyes as a video camera and Brain is the processing and storage unit. Let us assume that the eyes capture video for 12hrs a day. Let us assume that the videos are stored in the standard high quality AVI format. Let us do a simple calculation.

12hr movie file in std. AVI format= 10GB (approx.)

Movie files stored in 1yr=3650GB

"Can a machine be much efficient to sort the data, delete the unwanted, remember the most wanted, process the bulk of data in a fraction of second and always give us the correct information?"

"What will be the size of storage unit and the processing speed of the machine if designed so?"

Now you can estimate the might of the brain which does all these and also more than these and keeps silent inside us with a negligible weight of 1.5kg.

"Can anyone replicate it artificially at least making the machine to perform 1/100th of its work?"

For everything, the answer is NO at present.

Betty Crow's Hook:

Two crows named BETTY and ABEL learnt to use bent wire to fish a bucket of food from a vertical tube (as in the picture). Then ABEL flew off with a hook.

- BETTY tried to use a single piece of wire for a while and then failed.
- The next thing what she did was a great example for intelligence.
- She then pushed one end of the wire into the tape holding the tube and moved the other end using her beak, making a hook.
- She then used the hook to carry the bucket.
- She did this correctly 9 times out of 10.



<http://news.bbc.co.uk/1/hi/sci/tech/2178920.stm>

To find more, give in GOOGLE: Betty crow Hook

This was reported and shown in BBC- August 2002. This is one of the examples portraying the intelligence of the living organisms.

This is a simple question to be raised.

"Can a Robot be able to replicate BETTY's mental process?"

The answer is No. Machines just do what they are programmed to. You can even program a machine to do this work. But it won't come under AI. AI is more about making the machines to learn by themselves. Let us consider the same event and analyze it a bit differently.

Now let us consider the crow to be a machine. In its first attempt with a straight wire, it could not produce the desired output. So it either produces an error statement or gives out improper output. There is no chance for it to take efforts to prepare a hook. What actually happens inside the crow is that it learns that the output is improper. So it identifies the required output and changes its code itself to get the required output.

"Can a machine edit its own code according to the output?"

The reasons for the behavior of the crow are

- 1) Innate behavior.
- 2) Learnt adaptation.
- 3) Self knowledge.

Now let us see a simple way to overcome this problem to a certain level.

Patternisation

Mentioning it again and again, A.I is simply making the machines to replicate the human brain. So let us discuss how language is covered by brain. It uses the concept of patternisation. For example, let us consider a sentence.

- 1) Ram is a teacher.

The sentence pattern of this sentence is S+V+C. To be straight, the brain recognizes the sentences in a pattern like this. It finds out the error if any part of a sentence mismatches the pattern. So our task is to code the pattern and rules to the computer.

Rules cover an important portion in this due to the flexibility of language. Flexibility leads to a lot of exceptions which all can be translated to machines as rules. Whenever there is a special case or an exception, there must be a rule inserted to maintain stability.

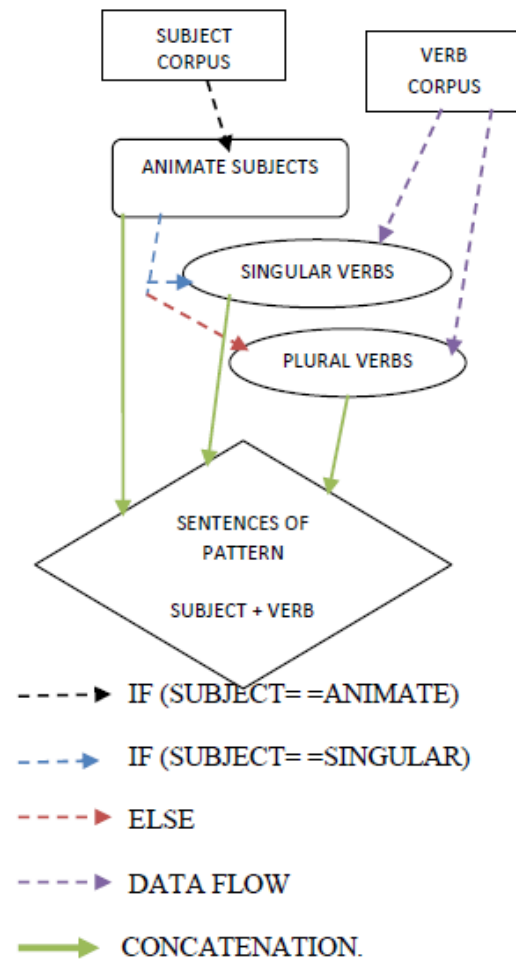
For example, let us consider the pattern S+V. In this pattern, a sentence is generated when a subject and a verb is fed. But the sentence generated is correct only when the subject is animate. So we need to insert a rule there which states that

"If subject is inanimate, sentence is wrong.

Else correct"

Machine can thereby generate and check all the sentences of this pattern. This can be implemented to all sentence patterns. This is a successful first step. This is only for sentences level.

Below there is a schematic procedure for the process mentioned above. The diagram clearly portrays the flow of data and the flow of controls to generate the sentences of pattern S+V.



This is the schematic representation of the algorithm for the automatic generation of the infinite number of sentences of the pattern "S+V".)

Apart from these the problems in the development of AI are discussed below:

Planning

Intelligent agents must be able to set goals and achieve them. They need a way to visualize the future (they must have a representation of the state of the world and be able to make predictions about how

their actions will change it) and be able to make choices that maximize the utility (or "value") of the available choices.

In some planning problems, the agent can assume that it is the only thing acting on the world and it can be certain what the consequences of its actions may be. However, if this is not true, it must periodically check if the world matches its predictions and it must change its plan as this becomes necessary, requiring the agent to reason under uncertainty. Multi-agent planning uses the cooperation and competition of many agents to achieve a given goal.

General intelligence

Most researchers hope that their work will eventually be incorporated into a machine with *general* intelligence (known as strong AI), combining all the skills above and exceeding human abilities at most or all of them. A few believe that anthropomorphic features like artificial consciousness or an artificial brain may be required for such a project.

Many of the problems discussed above are considered AI-complete: to solve one problem, you must solve them all. For example, even a straightforward, specific task like machine translation requires that the machine should follow Reason (the author's argument), Knowledge (know what it's talking about), and Social Intelligence (faithfully reproduce the author's intention). Machine translation, therefore, is believed to be AI-complete: it may require strong AI to be done as well as humans can do it.

What Is Artificial Intelligence?

It is more general than some definitions imply:

AI is a (relatively) new approach to some very old problems about the nature of mind and intelligence.

It combines with and contributes to several other disciplines, including:

- Psychology
- Philosophy
- linguistics
- biology
- anthropology
- logic
- mathematics
- computer science & software engineering

and other subjects that study humans and other animals. AI is neither a branch of Computer Science, nor a purely engineering discipline.

The Change Required:

A tiny group of scientific fields can never achieve this task. It requires the involvement and team work of numerous scientific fields. Further it also requires the effective participation of linguistics department. Without the team work artificial intelligence can never be achieved. AI is a difficult dream of humans. In the present context what we can do is simply enjoy and admire the efficiency of AI in the fiction Movies and Novels. The next few generations have no chance of even smelling the sweet fragrance of AI in their graveyards. The Patternization is the present hold for the development of AI. If this patternization is achieved, AI can be achieved in the interaction level, thus leading us to the hopeful and stimulated development of the next step.

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