SJIF Impact Factor: 6.260| ISI I.F.Value:1.241 Volume: 4 | Issue: 12 | December | 2019 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Peer Reviewed Journal

ARTIFICIAL INTELLIGENCE: NEXT GEN COMBINATORIAL OPTIMIZATION

Shubh Dhawan
Student, Masters in Computer Applications, Jagan Institute of Management Studies, Delhi, India

Latika Kharb
Professor, Jagan Institute of Management Studies, Delhi, India

ABSTRACT
In this paper an observation has been made on the evolving technology artificial intelligence which is being used by major firms and is growing at a marvelous rate. Artificial Intelligence is not just applied in robotics but it is a combination of Big data, Machine Learning, Combinatorial Optimization, and Natural Language Processing. It is the new generation of technology which will help us in many ways. Different technologies are already using these techniques to provide more functionality in their applications.
KEYWORDS: ***Artificial Intelligence, Big data, Machine Learning, Combinatorial Optimization, and Natural Language Processing.***

OVERVIEW
To Understand Artificial Intelligence better Let's start with the basics of Artificial Intelligence:

- Big Data:- Large data sets that are analyzed by using patter revelation, trends, associations which will help in relating to human behavior and interactions. It deals with very large data sets that are too complex to be solved with traditional data-processing software.
- Machine Learning:- it is an application of artificial intelligence that will provide the computer to learn automatically from experience without being programmed explicitly. It mainly focuses on programs that can access data and use it for themselves.
- Combinatorial Optimization:- it is an emerging field of theoretical computer science that uses combinatorial techniques that aims to solve discrete optimization problems. It finds the best possible solution from a finite set of problems.
- Natural Language Processing (NLP):- It involves machines or robots to understand and replicate the language that humans speak. It also tries to understand the emotions and reactions of human beings.

Sophia Robot is one of the major examples of weak Artificial Intelligence. Sophia robot uses artificial intelligence, facial recognition, and visual data processing. She can also imitate human gestures and answers certain types of questions on some topics.

Sophia can answer most of the questions that are asked and imitates human expressions as well. Sophia is the future of AI.

Natural Language Processing (also called as computational linguistics) is a field of computer science, artificial intelligence, information engineering it is concerned with interactions between humans and computers to analyze large amounts of data. In simple words, it deals with computers acting like humans and understanding them.

These days most of the human to human communication is mediated by computers. Also,

conversational agents are now becoming an important part of a human to computer communication.

There are various types of ambiguities in natural language processing like:-

- Lexical: occurs at a word level, a single word can be a noun or a verb
- Syntactical: occurs at the sentence level.

E.g.- if I want to call a cab using my voice commands, then I will say "call me a cab".

The assistant can interpret it in 2 ways: 1. Call a cab for me 2. Call ME a cab.

This is a major ambiguity that NLP faces.

Another example is – "I made her duck"

Here, "duck" can be a noun or a verb also the sentence can be understood as that the duck was made for her to eat or she was changed into a duck, which is practically not possible.

- Referential: it includes reference errors.

E.g. In the sentence "A went to B and said I'm hungry". The analyzer can sometimes predict it as that A is saying to B that my name is hungry, which is absurd.

In a recent seminar with Sunder Pichai, he discussed how can Natural language processing help Google users to make their life much easier with a technology (which is about to launch) called "Google Duplex".

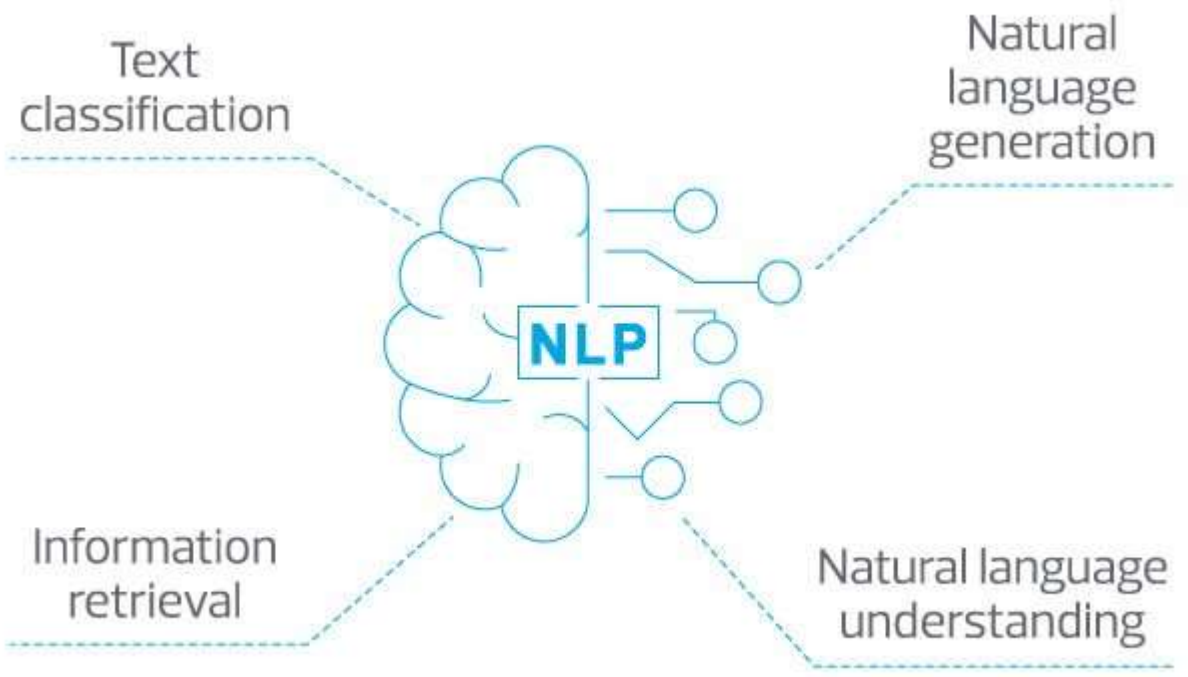
In the above video, we can see how the assistant makes a call to a salon and it responds just like humans and understands the words of the person talking to the assistant properly.

It also books a table at a restaurant in a perfect manner and analyzes each and every command of the hotel manager and responds accordingly.

This technique is called Natural Language Processing.

This technique includes many steps:

1) Lexical Analysis
2) Syntactic Analysis
3) Semantic Analysis
4) Disclosure Analysis
5) Pragmatic Analysis



Siri, Alexa and google assistant are the main examples of natural language processing.

Natural Language is generated using:-

1. Text planning: it is the knowledge base. Machine plans the text from the knowledge base.
2. Sentence planning: it means arranging of words in order to make meaningful sentences.
3. Text realization: structuring the sentences formed using the above techniques and delivering them as the output on the computer.

Unix word count is an example of language processing application as to count words you need to understand what a word is that is the knowledge of the language.

Computer artifacts are not considered in the word count of language processing.

CONCLUSION

Since the Artificial Intelligence has been introduced it is fiction for many people like we have seen in sci-fi movies. As with the growth of new technologies Artificial intelligence is becoming reality that we can achieve in the nearby future Artificial Intelligence is a boon for the people. It is a major part of everyday life. AI is now growing at a much faster rate and is developing technologies like- IoT(internet of things) because of which we can control our appliances like AC, TV even when we are away from our home by a single click on our mobile applications.Since we are still dealing with weak AI and strong AI is not fully developed, it has helped us to grow and make use of various factors present around us. In the near future this field of technology will grow at a faster rate but these technology can also harm human existence

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