JOURNAL OF MULTIDIMENSIONAL RESEARCH & REVIEW

Website: http://www.jmrr.org Vol.2, Iss.3 Pages:18-24

TYPICAL ANALYSIS ON THE TASKS AND TECHNIQUES OF NATURAL LANGUAGE PROCESSING APPLICATIONS

N Kannammal[1], B Sangeetha[2],V Sugapriya[3]
[1]Assistant Professor, [2,3]BSc Computer Science,
Holy Cross College, Trichy, Tamilnadu

Article Received: April 2021 Published: October 2021

Abstract

Natural Language processing is a subfield of artificial intelligence that helps computer to understand, interpret and utilize human languages. Early computational approaches to language science centered on automating the language structure analysis and improving fundamental technologies including machine translation, speech recognition, and speech synthesis. Today's researchers develop and use these resources in real-world applications, build spoken dialog systems and voice-to-speech translation engines, mining social media for health or finance information, and identify feelings and emotions against products and services. This paper describes application and levels in this rapidly advancing area.

Keywords: Natural Language Processing, Natural Language Generation, Natural Language Understanding, Applications.

INTRODUCTION

Natural Language Processing (NLP) is the computerized approach to analyzing text that is based on both a set of theories and a set of technologies. Natural Language Processing is a theoretically motivated range of computational techniques for the analysis and representation of naturally occurring texts at one or more levels of linguistic analysis with the aim of achieving human-like language processing for a variety of tasks and applications.

Businesses use massive quantities of unstructured, text-heavy data and need a way to efficiently process it. A lot of the information created online and stored in databases is natural human language, and until recently, businesses could not effectively analyze this data. To solve these problems natural language processing is very useful.

NLP is a branch of AI that is used for interpreting, summarizing and understanding human language. The main objective of NLP is to build systems or software pipelines that can make sense out of text and perform tasks such as translation, grammar checking, topic classification, etc. Natural language processing (NLP) is the ability of a computer program to understand human language as it is spoken and written is referred to as natural language. It is a component of Artificial Intelligence. NLP drives computer programs that translate text from one language to another, respond to spoken commands, and summarize large volumes of text rapidly even in real time.

Natural language processing (NLP) is a medium of interaction between humans and computers via Computer Science and Artificial Intelligence. It brings the computer language into a simple version. It is through NLP that the data is interpreted and manipulated into simpler and easy to understand. This transformation makes decision-making easier and faster because of the simple textual versions..

LITERATURE SURVEY

In paper [1] Krishna Prakash Kalyanathaya, D. Akila and P. Rajesh(2019) The main purpose of this paper is research areas in focus are conversation systems, Language processing and Machine Translation, Deep learning. Work in these areas contributes to various tools being built to create industrial applications. The fusion of deep learning techniques with natural language processing involves finding a lot of applications in fields such as healthcare, banking, engineering, education, retail and customer services.

In paper [2] M.A.Anusuya and S.K.Katti (2009) This paper presents a brief survey on Automatic Speech Recognition and discusses the major themes and advances made in the past 60 years o f research. This paper also addresses the significance and efficacy of the algorithms used for clustering purposes in the quantization of vectors. Speaker-dependent identification accuracies and speaker-independent methods and highly spotted.

In paper [3] Mani, I., & Maybury, M. T. (Eds.). (1999) This paper mainly discusses about summarization and how the big data representation is summarizing in a such a way that

representation of big data is easier for understand. Then source Text Preparation, Morphological Analysis provides all the meanings for every word.

Comparison Table between Text Mining and Natural Language Processing

Text Mining	Natural Language Processing
Aim of text mining is to extract useful insights from structured & un-structured text	Aim of NLP is to understand what is conveyed in speech.
Text Mining can be done using text processing language like Perl, statistical models, etc.	NLP can be achieved using advanced machine learning models, deep neural networks, etc.
Outcome: ➢ Frequency of words ➢ Patterns ➢ Correlations	Outcome: ➢ Semantic meaning of text ➢ Sentimental analysis ➢ Grammatical structure

PROPOSED METHODOLOGY

TRENDS AND APPLICATIONS IN NLP

The natural language processing offers a range of applications with both theory and implementation. Any code that uses text is potentially a candidate for the NLP.

The most common applications which use NLP include the following:

1) Supervised and Unsupervised learning

Supervised learning is model learning where input variable and output variable as well as algorithm are required to map output and input.

Unsupervised learning is where only input data is needed, and there is no output variable.

a) Summarization

In this period, the knowledge is rising day by day, hitting its limit and its difficult to access and exceeding our comprehension ability. For large amounts of data, summarying has the capacity to understand the important information. The function of

summing up can be either supervised or unmonitored. The collection of relevant material from the data includes all the data.

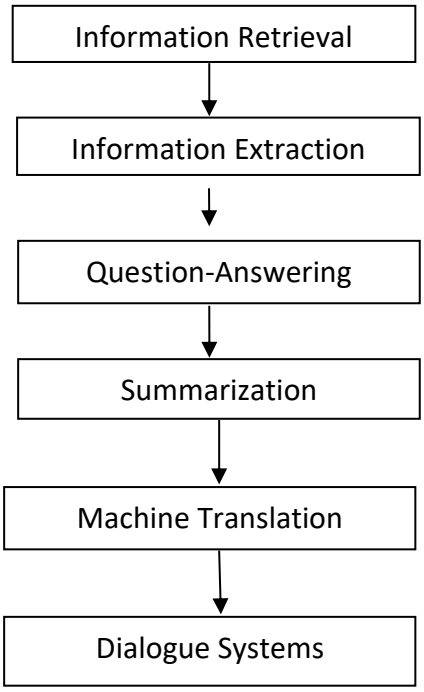

Fig 1 Applications of NLP

2) Reinforcement Learning

After taking up reinforcement learning, a variety of natural language generations (NLG) such as text categorization are being explored.

a) Text Categorization

Text Categorization may be defined as the technique for producing a short, accurate summary of the longer text document or its Categorization system input a wide flow of data land assigning it to predefined categories or indices.

Many organizations used categorization systems to categorize tickets for troubleshooting or requests for feedback, and routing to the correct desks.

3) Deep learning

Deep learning is an artificial intelligence (AI) field which has networks capable of learning from unstructured data unsupervised. It is also known as deep neural learning or profound neural networking. Often, deep learning is seen as a branch of machine learning. Machine learning uses simpler definition while the artificial neural network deals with deep learning. By using this technique i.e., the data on social media is present in very large amounts. Deep learning can easily be translated or interpreted in such a way as to be understandable. Without any human intervention it can be used to easily solve any pattern recognition problem.

4) Machine Translation (MT)

Machine Translation (MT), the method of translating one source language or text into another language, is one of NLP's most important applications. The problem with machine translation technology is not to translate words of a particular phrase directly, but to preserve the meaning of phrases in the same way as grammar and tenses.

5) Question – Answering

Another big natural language processing (NLP) feature is Question -Answering. There are different search engines that put the knowledge about all but still have the issue when answering the question posted by humans in their natural language. Question-answering is a discipline in computer science that falls under in AI and NLP. This focuses primarily on building systems that will automatically answer human posted questions in their natural language. The exact answers can be provided by doing the questions syntax and semantic analysis. Lexical distance and multilingualism are some of NLP's problems, thus creating a strong answering framework for questions.

6) Sentiment Analysis- As the name suggests, an examination of sentiments is used to distinguish sentiments between several blogs. It is also used to define sentiment where there is no clear expression of the emotions. Organizations use sentiment analysis, a natural language processing program (NLP) to classify their consumers ' opinions and feelings online. It will primarily help businesses to understand what their customers think of the products and services. Companies may determine their product quality as well as evaluate overall reputation from customer posts with the aid of an examination of sentiment.

6) Dialogue System- Dialogue systems, which focus on narrowly defined applications (like refrigerator or home theatre systems) currently uses the phonetic and lexical levels of language.

After some time, all stages of language processing are used by these dialog systems to provide possibilities for fully automated dialog systems. Whether on text or through speech, it doesn't matter. This could lead to the development of systems that allow robots to communicate in natural languages with humans. Examples such as Google's assistant, Windows Cortana, Apple's Siri and Amazon's Alexa are the apps and devices that implement Dialog frameworks for natural language human interaction.

NLP BENEFITS

The main benefit of NLP is that it improves the way humans and computers communicate with each other. The most direct way to manipulate a computer is through code by the computer's language. By enabling computers to understand human language, interacting with computers becomes much more intuitive for humans. It improves documentation accuracy and efficiency and also capable of converting complex summary texts into readable summary texts. Personal assistants such as Alexa are very useful. It allows the enterprise to use various customer support applications. It is easier to perform sentiment analysis.

DISCUSSION

NLP applications have achieved a good level of maturity, and a few impactful examples in recent times includes Scraping latest reports, research papers, etc., and contextually summarizing key findings to save researchers time, Taking meeting notes and generating summaries and also used for Building web applications using plain English instead of software code, etc.

Communication is an important factor that builds relationship among individuals, and also between organizations and individuals. Interactions among the people from different countries have been facilitated using translators. However, with the development of NLP, communications between such entities have become easier, with language no longer being a barrier to human and business interactions.

There are three types in which NLP can be generated- basic, template and advanced. While basic converts the language using functions, template allows the user to decide upon content templates and gives the liberty to control the output. Advanced natural language generation produces data based on need and requirement. Although it analyses data from the beginning, results are presented based on the requirements.

NLP is focused on deriving analytic insights from textual data, and also based on deep learning. It leverages data patterns and Artificial Intelligence to come to a conclusion. It tries to find a relation between samples of data and assimilate them together into the desired outcome. The algorithm uses descriptive and predictive analytics to come to results.

NLP supposedly makes the job easier but still demands a human interference. People and the industry fear NLP would start a trend of job snatching which is true to a certain sense but it certainly cannot function the way it does without human inputs. The will to work and cater to the loopholes or bugs in a machine is the task of a human who is handling it. Notwithstanding, the advantages of NLP may anger in the arena of jobs but right now it is the knight in the shining armor of the industry.

NLP provides a wide set of techniques and tools which can be applied in all the areas of life. By learning them and using them in our everyday interactions, our life quality would highly improve, as well as we could also improve the lives of those who surround us. NLP techniques help us improving our communications, our goal reaching and the outcomes we receive from every interaction. They also allow as overcome personal obstacles and psychological problems.

CONCLUSION

NLP becomes a very popular and important part of our lives because this increasing technology reduces human effort in terms of work, mainly in communication. NLP offers a wide array of techniques and tools that can be implemented across all areas of life. NLP methods help us improve our communication; achieve our target and the outcome that get from every day. By

using NLP, the questioning-answering feature is provided which plays a vital role in communication. This paper basically serves or gives the detailed communication between machine and user that can occur through the various NLP levels. While using NLP features the main advantage is time consumption for taking input as well as giving the output.

REFERENCES

1. Dr. M Hanumanthappal, Rashmi S and Jyothi N M (2014).” Impact of Phonetics in Natural Language Processing: A Literature Survey” IJISET International Journal of Innovative Science, Engineering & Technology, Vol. 1 Issue
2. Feldman, S. (1999). NLP Meets the Jabberwocky: Natural Language Processing in Information Retrieval. ONLINE-WESTON THEN WILTON-, 23, 62-73
3. Krishna Prakash Kalyanathaya, D. Akila and P. Rajesh (2019).” Advances in Natural Language Processing – A Survey of Current Research Trends, Development Tools and Industry Application” International Journal of Recent Technology and Engineering (IJRTE) ISSN: 2277-3878, Volume-7, Issue-5C
4. M.A.Anusuya and S.K.Katti (2009).“Speech Recognition by Machine: A Review” (IJCSIS) International Journal of Computer Science and Information Security, Vol. 6, No. 3.
5. Mani, I., & Maybury, M. T. (Eds.). (1999). Advances in automatic text summarization (Vol. 293). Cambridge, MA: MIT press.
6. Ranjan, P., & Basu, H. V. S. S. A. (2003). Part of speech tagging and local word grouping techniques for natural language parsing in Hindi. In Proceedings of the 1st International Conference on Natural LanguageProcessing (ICON 2003).
7. T. Mane, & U. V. Kulkarni(2017). A survey on supervised Convolutional Neural Network and its major application. (Vol .4)International Journal of Rough Sets and Data Analysis.
8. Ronan Collobert, Jason Weston, Leon Bottou, Michael Karlen, Koray Kavukcuoglu, & Pavel Kuksa (2011). Natural Language Processing from Scratch. Journal of Machine Learning Research 12
9. Vishnuprakash Sharma , Ajay Panchal and Vijaya Yogesh Rane (2020). An Analysis on current research trends and applications of Natural Language Processing, International Journal of Advance and Innovative Research,Vol.7

Cite this article:

Kannammal N, Sangeetha B, Sugapriya V, “Typical Analysis on the Tasks and Techniques of Natural Language Processing Applications”, Journal of Multidimensional Research and Review (JMRR), Vol.2, Iss.3, pp.18-24, 2021