

TensorFlow – NLP

Introduction

With the current advances in technology, computers can now process huge amounts of data quickly and efficiently. One area that computers can be used is to process and analyze natural language data. There is a lot of information that is generated from spoken language as well as written text. Having technology that can process and analyze this natural language data allows for the ability to extract important information and meaningful insights. An important tool that is used today to assist in Natural Language Processing (NLP) tasks is TensorFlow. TensorFlow is a software tool used for machine learning that can be used to perform many tasks around Natural Language Processing (NLP). NLP is a field within artificial intelligence that deals with how computers process and analyze large amounts of text and spoken data. With the great amount of text data that is being generated, Natural Language Processing (NLP) has become important in order to understand and analyze this data. With the help of TensorFlow, Natural Language Processing (NLP) can be performed more efficiently.

TensorFlow

TensorFlow is an open source library for machine learning and artificial intelligence. It was developed by Google Brain team within Google AI, which is a research division at Google. TensorFlow uses Python to provide a front-end API for building applications with the framework, while executing those applications in C++. TensorFlow is available on 64-bit macOS, Linux, Windows iOS, and Android. It can be used across a wide variety of tasks with a focus on training and inference of deep neural networks. TensorFlow bundles together multiple machine learning and deep learning models and algorithms to allow software engineers to build machine learning applications using a variety of tools and libraries.

TensorFlow allows users to build dataflow graphs and structures by the use of tensors. Tensors are multi-dimensional arrays that store the data. When the data is stored in tensors, computations can be performed, which happen in the form of graphs. The first thing that a TensorFlow program does is build a computational graph. The next thing that a TensorFlow program does is execute the computational graph. The execution of these computational graphs can happen either in CPUs, GPUs, or distributed across CPUs and GPUs so that the processing becomes faster. By building and executing computation graphs, training of the models in deep learning occurs.

TensorFlow is a very popular tool for machine learning for several reasons. To begin with, TensorFlow supports high-level APIs, which allows for the building of machine learning models easily. In addition, many complex computations can be done easily and efficiently using TensorFlow. Finally, it allows for easy computation and deployment using both CPUs and GPUs. Therefore, TensorFlow is an important tool that can be used to perform many Natural Language Processing (NLP) tasks.

Natural Language Processing (NLP)

There is huge amount of text data and speech data that is generated. Human language can be ambiguous, complex, and diverse. Also, human language is changing and evolving over time. In order to

extract useful information out of this data, it needs to be processed. Natural Language Processing (NLP) is a branch of artificial intelligence (AI) that deals with how computers process and analyze large amounts text and spoken words data. By processing and analyzing this data, meaningful information and insights can be extracted.

Natural Language Processing (NLP) is composed of several tasks that involve syntactic analysis and semantic analysis, which break down human language into chunks that machines can understand. Syntactic analysis, also known as parsing, is the process of analyzing natural language to extract meaning of words. Semantic analysis is the process of drawing meaning from text.

In order to make sense of human language, several pre-processing tasks of Natural Language Processing (NLP) need to be performed first. These include lexical analysis (tokenization), part-of-speech (PoS) tagging. Next, once the data has been processed, Natural Language Processing (NLP) algorithms can be built. One type of algorithms that can be built is machine learning algorithms. These algorithms are based on statistical methods and learn to perform tasks. The benefit of using machine learning algorithms is that they have the ability to learn on their own, without defining the rules manually.

NLP Using TensorFlow

TensorFlow can be used for various applications and a wide variety of Natural Language Processing tasks. To begin with, TensorFlow allows for tokenization, which converts a large piece of text into smaller units called tokens. The tensorflow_text package provides several tokenizers available in order to preprocess text. Furthermore, TensorFlow has the capabilities to perform part-of-speech (PoS) tagging. PoS tagging is the process of adding part of speech category to each token for a given piece of text. Some of the PoS tags that can be performed are tagging the tokens as noun, pronoun, verb, conjunction, preposition, or adjective. TensorFlow has a high-level API called Keras that allows for part-of-speech (PoS) tagging. Moreover, TensorFlow can be used to perform text classification tasks. Text classification is the process of assignment of categories to text according to its content. It has a wide variety of applications including sentiment analysis. Text classification can be used to perform sentiment analysis on various datasets. Sentiment Analysis is the process of analyzing text to detect positive or negative sentiment in a text. Tensorflow_hub library within TensorFlow can be used to load trained models that allows it perform text classification.

TensorFlow can be used for many Natural Language Processing (NLP) applications. These applications include voice assistants. These virtual assistants use natural language processing technology to identify and understand voice commands. Natural language processing allows the virtual assistants to learn from the users with their interactions. In addition, TensorFlow can be used to support NLP that can provide personalized recommendations for customers. Therefore, user experience can be improved with the use of NLP.

Moreover, TensorFlow supports NLP that can perform language translation. It automatically converts the text from one language to another while keeping the meaning the same. In addition, it can support NLP for information retrieval by finding documents that are relevant to users. Furthermore, it can perform speech to text, which is the translation of spoken language into text. Also, it can support text-

to-speech, which converts text into spoken voice output. In addition, TensorFlow can be used to support NLP that can perform text summarization. Text summarization is the process of summarizing the information in large amounts of text while retaining important information from the text.

Conclusion

There is a lot of unstructured data that can be processed. Both text data as well as spoken data has so much information that can be analyzed. Natural Language Processing (NLP) is the process of identifying this data for analysis. By analyzing this data, useful information and useful insights can be extracted. Natural Language Processing (NLP) has improved the way that humans and computers interact with each other. One popular tool that assists with performing natural language processing tasks is TensorFlow. TensorFlow is a very useful software tool used for natural language processing tasks. TensorFlow has many capabilities that help assist with natural language processing so that useful information and insights can be extracted from text data.

References

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