AUTOMATED TEXT SUMMARIZER

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FLOW OF PRESENTAION

Hereby we've subsequently laid out a short walkthrough of our project presentaion.

Relevance of Text Summarization.

Abstractive vs Extractive

Tranformers

PEGASUS model

Colab notebook & Code walkthrough

Conclusion & Vote of thanks

Relevance of Text Summarization

Definition

Automatic text summarization comprises a set of techniques that use algorithms to condense a large body of text, while at the same time preserving the important information included in the text. It is an area of computer automation that has seen steady development and improvement,

Importance

A large amount of the information we create and exchange is in written form. Therefore, systems that can extract the core ideas from text and preserve the overall meaning stand to revolutionize entire industries, from health care to law, to finance, by allowing us to share information faster and more efficiently.

In recent years, this area has become a particular point of interest due to the explosion of written content available online. Everything from tweets, to news articles, to blog posts includes text. This text may contain vital information for businesses, brands, financial asset traders, etc. but the amount of text generated far outpaces our ability to process it. Unless, of course, we can summarize it intelligently. This is where automatic text summarization comes in.

Extractive V/S Abstractive Summarization

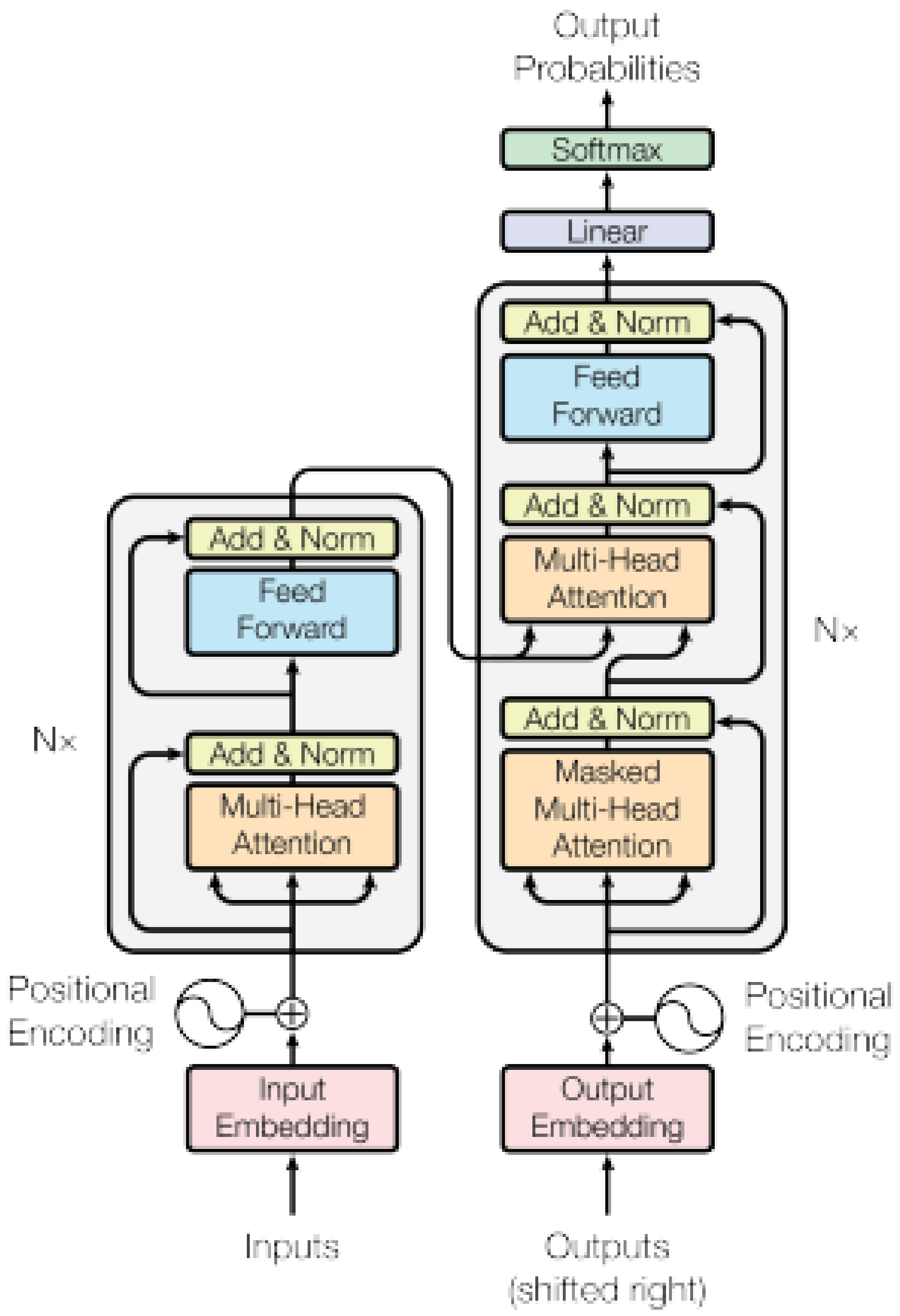
Extractive Summarization

Extractive summarization algorithms perform a seemingly very simple task: they take in the original text document and extract parts of it that they deem important. This means that they do not create new data (new sentences). Instead, these models simply select parts of the original data which are most important and combine them to form a summary.

Abstractive Summarization

Instead of just rewriting parts of the original text document, abstractive summarization methods mimic humans by creating completely new sentences to describe key concepts from the original text document. These new sentences can often use new words, not present in the original text, and aim to contain just the core information, with everything unimportant removed.

TRANSFORMER: NLP Based Tool



INTRODUCTION

Transformers are a family of architectures built to transform an input sequence into an output sequence, by using a special encoder-decoder architecture. The special thing about transformers is the inclusion of a "self-attention" function and a few other modifications such as positional encoding.

Transformers can given some input text, generate completely new text. In the case of abstractive summarization, transformers take the original text as the input and generate the summary text as the output.

Text summaries created using transformers are usually of high quality, and because they are generated by transformer models from scratch, include original sentences.

PEGASUS MODEL

- PEGASUS is similar to other transformer models. The main difference comes from a special technique used during the model pre-training.
- During PEGASUS pre-training, the most important sentences in the training text corpora are masked (hidden from the model). The model is trained to generate these sentences as one output sequence.
- It turns out that this ability to generate important sentences from a given text is very close to what what is needed for successful abstractive summarization.
- The creators of the model trained the model on a very large number of web pages and news articles. However, the model can be further fine-tuned on small datasets (our own text data) and achieve very good results on domain-specific text.

CODE OUTPUT & WALKTHROUGH

INPUT PARAGRAPH

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example_text = """Deep learning (also known as deep structured learning) is part of a broader family of machine learning methods based o
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Deep learning (also known as deep structured learning) is part of a broader family of machine learning methods based on artificial neural networks with representation learning. Learning can be supervised, semi-supervised or unsupervised. Deep-learning architectures such as deep neural networks, deep belief networks, deep reinforcement learning, recurrent neural networks and convolutional neural networks have been applied to fields including computer vision, speech recognition, natural language processing, machine translation, bioinformatics, drug design, medical image analysis, material inspection and board game programs, where they have produced results comparable to and in some cases surpassing human expert performance. Artificial neural networks (ANNs) were inspired by information processing and distributed communication nodes in biological systems. ANNs have various differences from biological brains. Specifically, neural networks tend to be static and symbolic, while the biological brain of most living organisms is dynamic (plastic) and analogue. The adjective "deep" in deep learning refers to the use of multiple layers in the network. Early work showed that a linear perceptron cannot be a universal classifier, but that a network with a nonpolynomial activation function with one hidden layer of unbounded width can. Deep learning is a modern variation which is concerned with an unbounded number of layers of bounded size, which permits practical application and optimized implementation, while retaining theoretical universality under mild conditions. In deep learning the layers are also permitted to be heterogeneous and to deviate widely from biologically informed connectionist models, for the sake of efficiency, trainability and understandability, whence the structured part.

OUTPUT SUMMARY

Deep learning is a branch of computer science which deals with the study and training of complex systems such as speech recognition, natural language processing, machine translation and medical image analysis. Deep-learning architectures such as deep neural networks, deep belief networks, deep reinforcement learning, recurrent neural networks and neuralal networks have been applied to fields including computer vision, speech recognition, natural language processing, machine translation, bioinformatics, drug design, medical image analysis, material inspection and board game programs, where they have produced results comparable to and in some cases surpassing human expert performance.

THANKS A LOT!