Google use case of NLP to interpret search queries

Summary of technology & what it does

Google uses NLP to understand and interpret the billions of users search queries that are happening on the platform every day, in order to surface the most relevant answers/ sources of information, and serve relevant ads, indifferent of how users spell the words or combine them into queries

How it works

Google introduced and currently utilises various technologies to interpret text and search queries, among which:

- **BERT (Bidirectional Encoder Representations from Transformers)** - a neural network-based technique for natural language processing (NLP) pre-training
    - Transformers are models that process words in relation to all other words in the sentence, rather than one-by-one in order and this makes BERT very performant at understanding both the context and the intent behind the queries. One of the application of this is predicting missing words from the search query by considering the surrounding words.
- **MUM (Multitask Unified Model)** - works with AI or natural language understanding and processing and answers complex search queries with multimodal data. MUM is multimodal and can process information from different media formats such as images, videos or audio files in order to answer questions. This gives Google access to additional information available within its own ecosystem and allows the search engine to answer questions even better. Also, MUM its trained across 75 languages and is able to comprehend and generate information across different languages, having the potential to remove one of the biggest barriers to access to information (language barrier)

Hardware advancements also make the use of the above mentioned technologies possible. As an example, BERT models are very complex and Google has started using their latest Cloud TPUs to serve search results and get users the information they need quicker.

Sources:
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