Overview of NLP

Natural Language Processing is which a computer can understand human languages such as English. It is the interaction between human speech and computers, where a computer understands words compared to binary bytes within a computer or generating words. From human language, a computer starts specific instruction within a computer program. AI is the ability to make estimates based on a series of data. AI is the umbrella term for the field, where a computer can recognize patterns, objects, thoughts based on a large amount of data. NLP is under the AI category which is more tailored through understanding human speech or language.

In Natural Language Processing, there are two sides, natural language understanding and natural language generation. Natural language understanding is the ability to understand language text. If you put down the words, hello or hi, the computer would understand that those words are greetings. Natural language generation is the computer ability to generate text. The computer would take the meaning of words and generate a reply. So in the example of understanding, the computer would take the greeting and generate a similar greeting to the user. NLP is everywhere, in the modern world, a good example of NLP is Siri on the iphone or chatbots or even translators.

NLP Approaches

NLP has 3 main approaches, Rules-based approaches, Statistical and probabilistic approaches, Deep learning.

Rules-based approaches, is the oldest approach when it comes to NLP. It's based on regular expressions and context free grammar. They tend to focus on pattern matching and have high performance on common cases, but do poorly with generalizing or cases they haven't prepared before.

Statistical and probabilistic came out in the late 1980s, where the computer counted words and found probabilities of words to be used in a language model. This could be determined as traditional machine learning since they learn based off of statistical and probabilistic methods. This approach includes training the model

on data, feature engineering, inferences, etc. Statistical and probabilistic uses algorithms like SVM, Naive Bayes, Decision Trees, etc.

Deep Learning uses the process of neural networks and is quite similar to the statistical and probabilistic approach. DL trains on a vast amount of data and uses it to understand languages. DL includes the uses of Neural Networks, Convolutional neural network, Recurrent Neural Networks, and Long Short-Term Memory.

Personal Interest

I've been interested in NLP since I used my first iPhone and the use of siri. I thought it was amazing that I could simply ask Siri to do something and she would understand and process that command. I would like to one day develop my own chatbot that could recognize audio input and process commands similar to siri. Most likely not on the small scale but has the same functionally.