CS 4395.001

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Overview of NLP

1. To me, Natural Language Processing (NLP) is that an AI can understand human language whether it is spoken or written. The computer would also be able to utilize the information it has processed to determine what it should use it for.

2. The relationship between AI and NLP is that AI is the general idea a computer can have the intelligence of a human being. NLP is related to AI being a subset of the subject. More specifically it would focus on the AI's understanding of the human language and what meaning it would gain from sentences.

3. Both NLU and NLG are subsets of NLP. However, NLU focuses specifically on how AI derives meaning from a sentence, while NLG would allow a computer to write sentences.

4. There are many applications of NLP in modern ways. A few examples include language translation, text-to-speech, chatbots, and predictive texts. All these examples either process or interpret the human language.

5. There are three main approaches to NLP. The first being rule-based. Rule-based means that the computer is given a set of rules to follow to help interpret words or phrases. This is one of the oldest approaches that is still being used today. A main example of rule-based approach still being used is a spell-checker. The computer is given a set of rules to figure out if a word is misspelled or a phrase is not grammatically appropriate.

The next main approach to NLP is the machine learning approach, or otherwise known as the statistical or probabilistic approach. The method utilizes a mathematical approach such as looking at the probability of how often certain words show up, or analyzing and identifying patterns. This approach is implemented in translating words from one language to another. For example, in English the phrase "Big brother" would be correctly translated to Spanish as "Hermano mayor" rather than "Hermano grande" or "Large brother".

Lastly, neural networks is one of the main approaches to NLP. As the name suggests, neural networks utilize some of the basic neural network methods such as recurrent neural networks (RNNs) and convolutional neural networks (CNNs) to model the human language. Google searches implements a machine learning approach to NLP. When someone types in a phrase that seems like a typo, not only does it find websites that best match the phrase, but it also gives a suggestion on a phrase that may be the correct way to say it.

6. Before taking this class, I did not really think about NLP nor the applications it can have. I did not realize that it was used in some of the everyday technologies we take for granted. This has piqued my interest with NLP, and I hope after taking this class, I would gain more insight into NLP. With what I learn in NLP, it might help me to understand and even build my own chat bot as a side project since I always wanted to know how chat bots worked. They seem so simple, yet they are able to answer important inquiries with minimal operator input.