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NLP, which stands for Natural Language processing, is the branch of Computer Science that involves computers being able to process text, speech, and human language. It studies how computers can understand language and text just as humans can, and involves translation, chatbots, grammar tools, speech recognition, spam filters, and anything that involves processing text to achieve various texts.

AI and NLP go hand in hand. In order to make computers understand text and their contexts in human speech, AI and machine learning is necessary since it would require tons of data to train computers to recognize speech. Also, there are various contexts and ways speech could be interpreted depending on culture, language, and even people, so having an AI approach would be beneficial in understanding various nuances and comprehension.

Natural Language Understanding (NLU) uses semantic analysis and grammatical structure to determine the meaning of a sentence. Natural Language Generation (NLG) is the ability for computers to generate language and text based on given inputs.

Some examples of modern NLP applications are Amazon Alexa, Virtual Assistants, Language Translators, Auto-Correct (and tools such as grammarly), and chat-bots. All of these are different examples that utilize NLP differently.

There are three different approaches to NLP. The first is the rules-based approach. This first began around 1960, and is based on a system that categorizes words and grammar into rules for computers to understand. For example, spell-check is considered rules based since it looks for irregularities in spelling, sentence structure, and grammar. They all revolve around rules. Another example is context-free grammar, since it is also based on rules. The problem with this approach is that rules can't fully encapsulate all the nuances and variations in human language, so creating complex systems involving NLP would be hard.

The second approach is statistical and probabilistic approaches. These use large data sets to help provide analysis for NLP models. For example, we have the use of word frequencies and traditional ML algorithms since they train based on data. The problem with this approach

Deep learning is the newest approach to NLP. This involves neural networks with many layers to help train computers to understand many different text and language requests. For example, smart devices, Google Translate, and advanced chatbots are some examples of Deep Learning. The problem is that it requires a lot of data and processing to work.

For me, NLP is very interesting as it has been used a lot more in recent times. The ability for computers to understand language and speech, something that has so much nuance and complexity is mind boggling and is exciting for me. I already took Machine Learning with Prof.

Mazidi in the past, so adding to my knowledge of Python through NLP is something that would benefit me and will help in my professional life!

f. write a paragraph describing your personal interest in NLP and whether/how you would like to learn more about NLP for personal projects and/or professional application