What is NLP?

NLP stands for Natural Language Processing, which is a branch of Artificial Intelligence (AI). It enables computers to analyze and comprehend human language, enabling them to carry out repetitive activities without human intervention. Machine translation, summarization, ticket categorization, and spell check are a few examples.

Relationship between AI and NLP

Human-machine communication is made feasible via natural language processing. It is the area of artificial intelligence that gives computers the ability to comprehend, interpret, and modify human language. Like machine learning or deep learning, NLP is a subset of AI. NLP is what you get when you take AI and concentrate it on human languages. NLP enables computers to produce responses, grasp the intent of a language, translate it to another language, and extract keywords and phrases. NLP was born out of linguistics in order to provide computers the ability to really process natural language. It merged with AI as it progressed from rule-based to machine-learning infused techniques.

Difference between NLU and NLG

NLU (Natural Language Understanding): It makes judgments and takes actions during the entire process. For NLU, what is written or said may not always be intended to convey the same thing. Errors and defects are possible. It makes sure that even when data is spoken or written with certain mistakes, it will still infer the proper purpose and interpretation. It is the capacity to comprehend the written word.

NLG (Natural Language Generation): The system responds by producing human language text from structured data. For NLG, although it produces organized data, the resultant text may not always be simple for people to grasp. NLG ensures that it will be intelligible by humans as a result.

Examples of modern NLP applications

    a. Email Filters
    b. Smart Assistants
    c. Predictive Texts
    d. Grammar Correction Tools
    e. Google Translate
    f. Etc.

3 main approaches to machine learning

    a. Rule-based
    The first NLP methods are rule-based ones. You might wonder why they're still in use. It's because they have been tried and tested and have a track record of success. When rules are applied to text, they may reveal a great deal of information. Consider what you

can discover about a piece of random text by looking for nouns, verb tenses, or Python code patterns. Examples of rule-based methods to NLP include regular expressions and context-free grammars.

b. "Traditional" Machine Learning

Probabilistic modeling, likelihood maximizing algorithms, and linear classifiers are examples of "traditional" machine learning techniques. Notably, these are not models based on neural networks (see those below). Training data, in this case a corpus with markup, feature engineering (word type, surrounding words, capitalized, plural, etc.), fitting a model on test data (typical of machine learning systems in general), and inference (applying model to test data), which is characterized by finding most probable words, next word, best category, etc. Traditional machine learning approaches also include "semantic slot filling."

c. Neural Networks

While there are some distinctions, this is akin to "conventional" machine learning. In most cases, feature engineering is foregone because networks will "learn" important features (this is typically one of the major benefits of using neural networks for NLP). Instead, very large training corpora of raw parameters (streams of "words" — actually vector representations of words) are fed to neural networks. Recurrent neural networks (RNNs) and convolutional neural networks are specific neural networks used in natural language processing (NLP) (CNNs).

Personal Interest in NLP

My interest in NLP arises from the dream of achieving fluent communication of computers with human, not just rules based, or based on source material provided during training, I want an AI to fluently talk to a human like it was another human being. Another interesting aspect of NLP to me is the ability for a system to follow commands and perform tasks with outmost accuracy regardless of a person's accent or voice under affected by various emotions. I would like to learn more about NLP from this class, and also by studying released papers online.