

Define NLP in your own words.

Natural Language Processing is the abstract mechanism in which computers can “comprehend” the semantic definition of human dialogue or text.

Describe the relationship between AI and NLP.

Artificial Intelligence looms over Natural Language Processing as it encompasses much more in the computational space. Natural Language Processing only serves as a singular branch in relation to artificial intelligence. Yet, the idea of precise natural language processing is a fundamental part of formulating the conceived notion of a true artificial intelligence. As an artificial intelligence is expected to easily both comprehend and communicate, within the boundaries of its authorization, to other humans.

Natural Language Understanding vs Natural Language Generation

Natural Language Generation has the capacity to generate human-readable sentences or text from data. However, Natural Language Understanding takes a human generated sentence or text and attempts to translate it into a format comprehensible by a computer. The differences lie in the transitional states. The natural language processor (understanding) translates unstructured complex human text to structured computer-readable data. On the opposite end, the natural language generator (generation) takes an already structured computer-readable set of data and translates it to human-readable text. For simply, the natural language processor can be thought of as the medium that then is input to the computer and the natural language generator as the medium that then is output to a human. Both acting as two sides of the same coin falling under the conceptualized idea of artificial intelligence.

Modern NLP applications

- Comprehend voice commands to then perform an action (ex: Alexa, Cortana, and Siri)
- Chatbots
- Language Translation
- Search Autocorrect and Autocomplete

Write 3 paragraphs for 3 approaches to NLP, and list examples of each approach**Rules Based Approach**

The rules-based approach was one of the first methodologies to address the complex problem of natural language processing. The idea was very simple. Take a list or set of rules that are in the confines of a particular human language and generate an algorithm that can “comprehend” the text. For example, the algorithm could utilize regular expressions and other easily accessible pieces of concepts of logic. An application of the rules-based approach would be the Eliza computer program. While the approach was approachable, it failed to appropriately encapsulate the complexity of human language. Certain phrases, words, or sentences that are foreign to the grammar rules exist. Therefore, for natural language processing to be considered a success it must comprehend that which lay outside the bounds of predefined notations.

Statistical and probabilistic Approach

The statistical and probabilistic approach is a more mathematical perspective on addressing the complicated idea of natural language processing. The abstract methodology is to develop a language model that takes the frequency of words or phrases and generates a probabilistic distribution. The probability distribution acts to give how likely a word or phrase either means something or belongs in the sentence. An example of the statistical and probabilistic approach is predictive text.

Deep Learning

Deep Learning applies neural networks as a foundation to develop an artificial intelligence that has the capability to adapt to its failures. Thus, there's a gradual improvement that can be seen. By utilizing deep learning, there's a highly likely chance that the results from the artificial intelligence are more accurate. However, a disadvantage to deep learning is that it requires both a large dataset and a processing unit with high computational power. Some examples of deep learning are computer vision, speech recognition, and recommendation engine (which falls under NLP).

Personal Interest in NLP and My Own Applications of It Potentially

NLP is very fascinating. To conceive of true artificial intelligence, it requires having sufficient natural language processing. Furthermore, the very idea of language and human speech has always been a highly complex and interesting topic. There are so many ways to encapsulate the definition of something yet the human brain so easily creates it and processes simply. As an individual, to consciously be aware of the true definition of a sentence requires some notable thought as different words or phrases may not correlate with their literal structural definitions. I want to learn NLP to both have the foundational knowledge for when the time comes that the field significantly advances and build projects such as an in-home AI.

SOURCES:

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