Hyperiondev

TASK

Capstone Project - NLP Applications

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Introduction

WELCOME TO THE NLP APPLICATIONS CAPSTONE PROJECT

Great job getting to this Capstone task! In this Capstone Project, you will be categorising and researching NLP applications. Let's get started!

NATURAL LANGUAGE PROCESSING APPLICATIONS

NLP applications can be classified into a number of categories based on what they do. Let's have a brief look at these categories.

Language Translation

The volume of information being put up online is growing at an incredible rate, but due to language barriers, not everything is accessible to everyone. Language translation helps us conquer these language barriers by facilitating the translation of technical manuals, support content, or websites quickly and inexpensively. The challenge with language translation technologies is not in translating words, but in understanding the meaning of sentences to provide a true translation. If you've ever watched a movie in one language with subtitles in another language where you have been able to understand both languages, you will realise how prone to error the process of translation, even using human experts can be. Sometimes the subtitles are outright wrong, and sometimes, although the words are translated accurately, the nuance of the meaning is lost or miscommunicated. Really effective NLP language translation is a challenging area in which exciting progress is being made.

Text classification

One of the applications of NLP that we experience on a daily basis is the text classification in our email folders: by using predefined categories, we can organise our spam folders and inbox so that we can access relevant emails or messages more efficiently.

Automatic summarisation

When working with huge amounts of information (like articles, books, and websites), it can be extremely useful to be able to shorten these pieces into condensed forms that only show the pieces of information that are most useful to you. This is what automatic summarisation is about. According to Expert System (2020): "Automatic summari[s]ation is relevant not only for summari[s]ing the

meaning of documents and information, but also for understand[ing] the emotional meanings inside the information, such as in collecting data from social media."

Sentiment analysis

Similarly to how we can infer someone's meaning from their tone, sentiment analysis allows us to detect the emotion behind a piece of text using NLP. This is particularly useful for large companies who want to know what the general sentiment people hold towards their company is. By analysing articles and write-ups about their company using sentiment analysis, they can gain a fairly accurate idea of how people feel about them based on the language used when they are discussed.

Question Answering

This is an application of NLP that has come a long way in a short space of time. Simply put, these systems allow a computer to answer a question posed by a human. Siri and Okay Google are well-known voice-based question answering systems, but text-based systems can now be seen on almost every banking or online shopping site in the form of a chatbox. ChatGPT is a relatively advanced implementation of a question-answering model.

Compulsory Task 1

Now that you know a little about the various categories of NLP applications, do you think you can identify these when considering particular applications? Give it a try.

- In a file called **nlp_1.pdf**, categorise each of the following use-cases:
  (Use the categories we have discussed on this bootcamp so far)

    a. A model that allocates which mail folder an email should be sent to (work, friends, promotions, important), like Gmail's inbox tabs.
    b. A model that helps decide what grade to award to an essay question. This can be used by a university professor who grades a lot of classes or essay competitions.
    c. A model that provides assistive technology for doctors to provide their diagnosis. Remember, doctors ask questions, so the model will

use the patients' answers to provide probable diagnoses for the doctor to weigh and make decisions on.

- Save your answer in the folder for this Task.

Compulsory Task 2

- An example of an innovative technology using NLP is Gmail's auto-response suggestions on your incoming emails. Imagine that I send an email to your Gmail address asking for an appointment. On opening the mail you will notice Gmail's automatically suggested response options such as "Yes, that works for me" and "Sorry, I'm not available at that time", intended to make replying as simple and quick as selecting the appropriate option (unless you want to say something more!)
- Read up on any similarly innovative technology using NLP (by companies such as Google, Microsoft, or IBM, for instance) and write a brief summary about the technology, what it does/achieves, and an overview of how it works (250 - 500 words).
- Save your answer in a file called **nlp_2.pdf** in the folder for this Task.

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REFERENCES

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