

Prompt Engineering



Table of Contents

Section 1: Definition of Prompt Engineering and its Role in Adapting Language Models.....	3
Section 2: Techniques for Designing Effective Prompts.....	3
Section 3: Applications and Benefits of Prompt Engineering in Different NLP Tasks.....	3
Section 4: Examples of Successful Prompt Engineering.....	4
Tutorial Reference:	5
Recent Advances and Research Papers:	5

Section 1: Definition of Prompt Engineering and its Role in Adapting Language Models

Prompt engineering refers to the process of designing and crafting prompts, which are input instructions or queries provided to language models, to guide their output and fine-tune them for specific tasks. It involves carefully selecting and formulating prompts to elicit desired responses from the language model, enhancing its performance and aligning it with the task requirements.

Language models like GPT-3.5 are trained on a diverse range of data and can generate creative and coherent text. However, without proper guidance, they may produce outputs that are not accurate, relevant, or appropriate for a given task. Prompt engineering helps address this challenge by shaping the behaviour of the model, enabling it to generate more useful and task-specific responses.

Section 2: Techniques for Designing Effective Prompts

To design effective prompts, several techniques can be employed:

Clear and specific instructions: Prompts should provide clear and unambiguous instructions to the language model, defining the desired output or behaviour. Clear instructions help the model understand the task and generate appropriate responses.

Context inclusion: Including relevant context in prompts can help the model generate more accurate and coherent responses. Context can be provided through preceding text or by explicitly mentioning relevant information.

System behaviour specification: Explicitly specifying the desired behaviour of the model in the prompt can guide it towards generating outputs that align with the intended requirements. For example, instructing the model to summarize a given passage or provide pros and cons for a particular topic.

Control tokens: Incorporating control tokens within prompts can influence the model's behaviour. These tokens can be used to specify attributes like sentiment, style, or desired output format. By leveraging control tokens, language models can be fine-tuned to exhibit specific characteristics.

Section 3: Applications and Benefits of Prompt Engineering in Different NLP Tasks

Prompt engineering has numerous applications across various natural language processing (NLP) tasks:

Text generation: In tasks like story writing, poetry generation, or dialogue systems, prompt engineering can guide the language model to produce coherent, on-topic, and creative text that aligns with the desired genre, style, or content.

Summarization: For summarization tasks, prompts can specify the length, format, or criteria for summarizing given input text, enabling the model to generate concise and informative summaries.

Translation: In machine translation, prompts can be used to specify the source language and the desired target language, helping the model generate accurate and fluent translations.

Question answering: Prompts can provide relevant context and query specifications for question-answering tasks, assisting the model in producing accurate and informative answers.

Sentiment analysis: By incorporating control tokens or explicitly specifying the sentiment in prompts, language models can be fine-tuned to perform sentiment analysis tasks, classifying text as positive, negative, or neutral.

Section 4: Examples of Successful Prompt Engineering

Prompt engineering has been successfully employed in research papers and real-world applications:

In the research paper "Few-Shot NLG with Pretrained Language Model Prompts," the authors introduced a method to generate text with fine-grained control. They used prompts to specify desired attributes like sentiment, style, and content, demonstrating the capability to control language models for text generation tasks.

OpenAI's "InstructGPT" project showcased the effectiveness of prompt engineering. Users were able to provide instructions to the model to write essays, create Python code, and answer questions. Well-designed prompts allowed users to guide the model's behaviour effectively.

In the medical domain, prompt engineering has been applied to generate case summaries, create discharge summaries, and assist with clinical decision support systems. By designing prompts that capture relevant patient information and medical terminology, language models can generate accurate and concise medical text.

Prompt engineering has also been employed in sentiment analysis tasks. By using prompts that specify the sentiment to be analysed and incorporating control tokens, language models can accurately classify text into positive, negative, or neutral categories.

Tutorial Reference:

<https://www.promptingguide.ai/>

<https://help.openai.com/en/articles/6654000-best-practices-for-prompt-engineering-with-openai-api>

<https://github.com/openai/openai-cookbook>

<https://towardsdatascience.com/best-practices-in-prompt-engineering-a18d6bab904b>

<https://github.com/brexhq/prompt-engineering>

Recent Advances and Research Papers:

- A Prompt Pattern Catalog to Enhance Prompt Engineering with ChatGPT

<https://arxiv.org/abs/2302.11382>

- Jailbreaking ChatGPT via Prompt Engineering: An Empirical Study

<https://arxiv.org/abs/2305.13860>

- Prompt Engineering For ChatGPT: A Quick Guide To Techniques, Tips, And Best Practices

https://www.techrxiv.org/articles/preprint/Prompt_Engineering_For_ChatGPT_A_Quick_Guide_To_Techniques_Tips_And_Best_Practices/22683919

- Large Language Models in the Workplace: A Case Study on Prompt Engineering for Job Type Classification

https://link.springer.com/chapter/10.1007/978-3-031-35320-8_1

- Large Language Models Are Human-Level Prompt Engineers

<https://arxiv.org/abs/2211.01910>

- A Taxonomy of Prompt Modifiers for Text-To-Image Generation

<https://arxiv.org/abs/2204.13988>

- Pre-train, Prompt, and Predict: A Systematic Survey of Prompting Methods in Natural Language Processing

<https://dl.acm.org/doi/full/10.1145/3560815>

- Prompt Engineering for Healthcare: Methodologies and Applications

<https://arxiv.org/abs/2304.14670>

- Just Tell Me: Prompt Engineering in Business Process Management

https://link.springer.com/chapter/10.1007/978-3-031-34241-7_1

To be continued...