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Exploring the Potential of Prompt Engineering: A Comprehensive Analysis of Interacting with Large Language Models

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***Abstract*—This article focused on exploring the core principles of prompt engineering, aiming to provide a comprehensive understanding of how to effectively interact with and instruct large language models (LLMs) using prompts. The article extensively covered various aspects of prompt engineering, including an analysis of its fundamental components, different types of prompts, ethical considerations in the prompting process, and the wide-ranging applications of prompt engineering. Additionally, the study conducted a comparative analysis between two conversational AI bots, ChatGPT 3.5 and BardAI, by subjecting them to similar prompts. The results of this comparison indicated a high level of similarity in their performances, suggesting that both bots are comparable in their capabilities. The study also highlighted the immense potential for further advancements in the field of prompt engineering. By investigating the intricacies of prompt design, ethical implications, and showcasing the promising applications, this article contributes significantly to the knowledge base surrounding prompt engineering. The findings not only shed light on the current state of the technology but also point towards numerous opportunities for future articles and development in this domain.**

***Index Terms*—prompts, prompt engineering,bots, ChatGPT 3.5, BardAI, LLMs.**

I. INTRODUCTION

Prompt engineering is an emerging discipline concerned with the design and optimisation of language model (LM) prompts for a wide range of applications as well as academic topics. Large language models (LLMs) are easier to comprehend in terms of their capabilities and limitations when engineers are able to act swiftly. Researchers use prompt engineering to enhance the performance of LLMs on a variety of common and complex tasks, including question answering and arithmetic reasoning. Developers develop reliable and efficient prompting techniques to interact with LLMs and additional resources using prompt engineering. It covers the fundamentals of prompts to offer a general notion of how to interact with and instruct LLMs using prompts. All prompt cases are examined using Bard AI or ChatGPT 3.5.

II. LITERATURE REVIEW

Brian Lester et al. (2021) [1] proposed a method known as

”The Power of Scale for Parameter-Efficient Prompt Tuning.” This method involves parameter-efficient prompt tuning of large language models (LLMs) using ”soft prompts,” which are a small number of additional parameters that condition the LLM on specific downstream tasks. Their findings indicate that soft prompts can significantly outperform traditional prompt based methods, such as GPT-3’s few-shot learning. Furthermore, as the size of the model increases, soft prompts become more competitive with model tuning, where all model weights are tuned.

In 2022, Ben Whately [2] introduced ”3 Principles for Prompt Engineering with GPT-3.” Whately’s objective was to effectively guide users on how to prompt GPT-3 to achieve the desired output. The principles he outlined are: 1) Be specific in your request to get the desired output; 2) Use relevant keywords to guide GPT-3’s focus on the content you want; and 3) Structure the prompt with clear instructions or guidelines for GPT-3 to follow. He emphasized the importance of using natural language, as GPT-3 is trained on a vast dataset of text. Whately encouraged users to be creative and experiment with different prompts to determine what works best. Louie Giray [3], in 2023, authored ”Prompt Engineering with ChatGPT: A Guide for Academic Writers.” The purpose of this guide is to introduce academic writers to prompt engineering and demonstrate how it can enhance the performance of ChatGPT on academic writing tasks. Giray found that there is no one-size-fits-all approach to prompt engineering. The best approach varies depending on the task at hand, and it is crucial to experiment with different prompts and be prepared to adjust your approach as necessary.

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Omer Aydın et al. (2023) [4] conducted a study titled ”Google¨ Bard Generated Literature Review: Metaverse,” which evaluated the application of artificial intelligence (AI) to the literature review process. Specifically, Google Bard was utilized to generate a literature review article on the metaverse. The results of the study indicated that AI can be used effectively to generate literature reviews, although there are still some obstacles to overcome. One of the main challenges in conducting literature reviews manually is the substantial time and effort required to identify and evaluate relevant studies, as well as the risk of human bias. In this study, Google Bard was first asked questions about the metaverse to help it understand the topic before generating the literature review. This approach highlighted both the potential and the current limitations of using AI in academic research tasks.

Jules White et al. (2023) [5] authored a study titled ”A Prompt Pattern Catalog to Enhance Prompt Engineering with ChatGPT.” The objective of this study was to provide a comprehensive catalog of prompt patterns that can be used to improve the performance of ChatGPT across a variety of tasks. The study underscores the importance of prompt engineering in the context of ChatGPT and offers practical guidance on how to utilize the prompt pattern catalog effectively. This catalog serves as a valuable resource for optimizing ChatGPT’s responses and enhancing its application in diverse scenarios.

III. UNDERSTANDING PROMPT ENGINEERING

Prompt engineering is the process of designing, refining, and optimizing input prompts to effectively communicate the user’s intent to a language model like ChatGPT [1] [6]. This method is crucial when seeking precise, pertinent, and coherent responses from the model. As language models continue to advance, prompt engineering has become a crucial talent for users who want to maximize the potential of AI chatbots across an assortment of purposes.

The primary means of communication between the user and AI chatbot are prompts. They direct the model to produce results that correspond with the intention of the user. Recognizing the intricacies of prompt engineering becomes essential for generating effective and meaningful interactions with AI chatbot, as the caliber of the prompts influences the level of the generated responses. This

requires taking into account variables that include the model’s training data, biases, and other limitations that may impact its comprehension and generation capacities.

For instance, consider two prompts and their respective responses.

Prompt 1: Write a short story in 100 words

Response: In a cozy village, curious Lily sought a mythical creature. Guided by fireflies, she braved the forest’s shadows and met friendly critters. On the fourth day, she discovered an ancient stone archway aglow with symbols. As she passed through, a majestic phoenix emerged, granting her a wish.

With a heart full of gratitude, Lily wished for peace in the world. The phoenix’s flames embraced her, and a warm glow spread across the land. The village thrived in harmony, and Lily’s bravery and selflessness became legendary, inspiring others to cherish the spirit of adventure and kindness in their hearts.

Prompt 2 : Write a short story in 100 words about a brave prince named Harry.

Response: Prince Harry, bold and valiant, faced an ancient curse that plagued his kingdom.

Determined to break it, he embarked on a perilous journey. Encountering treacherous forests and wicked foes, he never wavered. In a forgotten cave, he found the enchanted amulet, the key to freedom. Dark forces fought to stop him, but he stood firm. With unwavering courage, he shattered the curse, releasing his kingdom from darkness. The grateful people hailed him a hero. Harry’s bravery and noble heart earned him not just the kingdom’s love but also the eternal admiration of all who knew of his legendary quest.

Factors influencing prompt selection

- The nature of the prompt
- The target audience
- The purpose of the prompt
- The resources available
- The preferences of the prompt creator

IV. COMPONENTS OF AN EFFECTIVE PROMPT

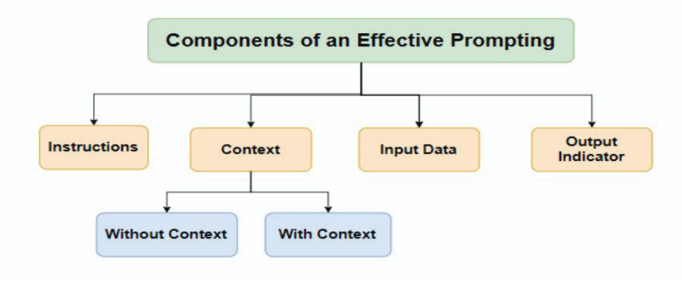

Fig. 1. Components of an Effective Prompting

A. Instruction

An instruction is a particular mission one would like the model to achieve. One may create effective prompts to perform multiple basic activities by instructing the model with commands about what you wish to accomplish. Some of these commands are: 1.Write 2.Classify 3.Summarize 4.Translate 5.Order, etc.

Remember that you must experiment extensively to determine which method works best. Test out various instructions with various keywords, contexts, and data [7]to determine which works most effectively for your specific instance of use and job. Typically, the greater the specificity and relevance of the context to the job that one is attempting to execute, the better.

Example of a prompt

Prompt: Convert 5 USD into INR.

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Response: As of today, July 25, 2023, 5 USD is equal to 409.80 INR.

The two factors one must keep in mind while writing instructions are:

1) Specificity: The more precise and specific the prompt, the greater the quality of the responses. This is especially important when a specific result or manner of generation is intended. Currently, there are no tokens or keywords that yield superior outcomes. A decent structure and a detailed prompt are of greater importance. In fact, presenting instances in the prompt has become highly successful at eliciting responses in particular formats.

Let's consider an example :

Prompt: From this paragraph, extract the names of the characters: Once upon a time, there lived a girl named Elena Gilbert. She had two best friends named Caroline Forbes and Bonnie Bennett. Up until Damon Salvatore and Stefan Salvatore invaded the town, they all lived happily in Mystic

Falls.

Response: The names of the characters mentioned in the paragraph are: 1. Elena Gilbert

2. Caroline Forbes
3. Bonnie Bennett
4. Damon Salvatore
5. Stefan Salvatore

2) Avoid Impreciseness: Considering the above advice about being descriptive and enhancing format, it is easy to fall into the pitfall of attempting to be overly clever with prompts, which can lead to imprecise descriptions. Often, it is preferable to be precise and forthright. This analogy is remarkably comparable to efficient communication: the more direct the message, the more effectively it is conveyed. Let's consider an example to avoid impreciseness

Prompt: Explain the meaning of Large Language Models. Don't give a detailed answer. Keep the answer short and sweet It is unclear from the prompt the number of phrases to use and in what manner to employ them. The prompt must be unambiguous.

Prompt: Explain Large Language Models in 4-5 lines.

B. Context

Context is external data or extra context that can guide the model towards more effective solutions. In the domain of prompt engineering, the term "context" pertains to the specific set of instructions or data that is presented to a language model prior to its generation of a response. Let's consider the following examples:

1) Without Context: Prompt: Suggest a movie. Response : Movie Recommendation: "The Shawshank Redemption

2) With Context: Prompt: Suggest a horror movie. Response : Movie Recommendation: "Get Out"

C. Input Data

The input data is an input or query for which we are seeking a response. In domain of prompt engineering, the term "input data" pertains to the data that is sent to a language model in order to create replies. The provided input data generally consists of a prompt that establishes the context or objective for the model, together with any further instructions or indications to direct the model's output.

Prompt: You are a helpful assistant who provides ingredients for recipe recommendations The user wants to cook tea please suggest the ingredients.

Response: Certainly! Here's a delicious and easy homemade ramen recipe: Ingredients:

Sure, I can help you with that. To make a basic cup of tea, you'll need: 1. Tea bags or loose tea leaves

2. Water
3. Optional: Sweetener (like sugar or honey)
4. Optional: Milk or cream

You can adjust the amount of tea, water, and any sweeteners or milk to your personal taste preferences. Enjoy your tea!

D. Output Indicator

The output indicator format or nature of the output Inside the domain of prompt engineering, an "Output Indicator" refers to a distinct signal or directive embedded inside the input data that serves to direct the reaction of the language model. The user's input specifies the preferred format or output type that the model should produce, taking into account the provided job or context.

Prompt: Please give the current temperature in Celsius." Response: The current temperature in Mumbai is 26°C. The weather is expected to be partly cloudy with a chance of showers.

The explicit directive "in Celsius" denotes that the prompt in this instance includes an output indication. This output indication instructs the language model to provide the temperature response using the Celsius unit of measurement, in accordance with the user's specific inquiry for the current temperature in Celsius. [7].

V. TYPES,TECHNIQUES AND STRATEGIES USED IN PROMPTING

A. Zero-Shot Prompting

The zero-shot strategy involves the LLM generating an answer without any examples or context [8]. This strategy works when the user desires a fast response without additional information or when the subject matter is so broad that providing instances would artificially constrain the response. Let's consider an example Prompt: Give me five baby boy names. Response: Certainly! Here are five baby boy names: 1. Liam 2. Noah 3. Ethan 4. Alexander 5. Benjamin

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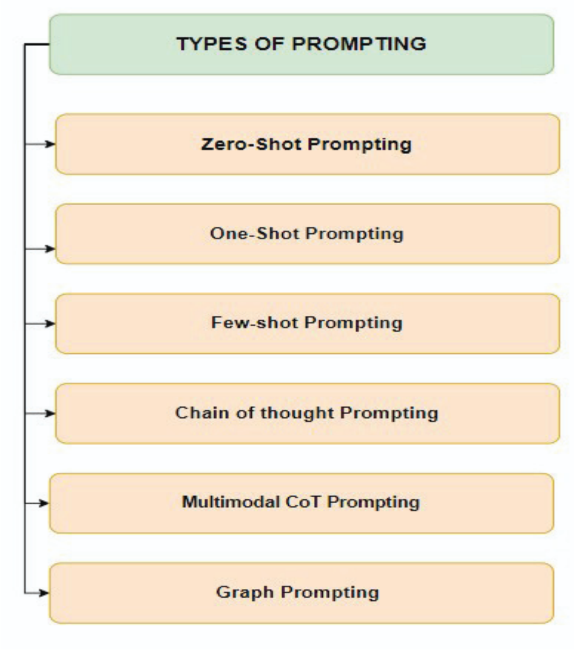

Fig. 2. Types of Prompting

B. *One-Shot Prompting*

The LLM will produce a response using the one-shot strategy based on a single example or piece of context [8] that the user provides. This strategy can direct an AI model's response and ensure that it corresponds to the user's intent. The notion here is that a single example would provide the model with more guidance than none. For example: Prompt: Give me five baby boy names. I like the name Aryan Response: Sure, here are five baby boy names that are similar to Aryan:

1.Aiden 2.Asher 3.Arjun 4.Ayden 5 Arion

C. *Few-Shot Prompting*

The few-shot technique entails the use of a Language Model (LLM) to generate a response by using a limited number of instances or contextual cues given by the user. Prompt: Give me five baby boy names. I like names like Aryan, Aahaan, and Aditya Response: Sure, here are 5 baby boy names that you might like: 1.Aarav 2.Agastya 3.Akash 4.Aman 5.Ayaan

D. *Chain of thought Prompting*

Chain-of-thought (CoT) prompting is a Google researcher's invention that encourages an AI model to elucidate intermediate phases of reasoning before giving the final solution to a multi-step problem. The goal is to design the model's reasoning trajectory to resemble the intuitive cognitive process [9] an individual would employ when confronting a multi-step, complex problem. Let's consider a complex problem-solving example in which Chain-of-thought (CoT) prompting can be applied. Let's consider an example Prompt: Maya has 10 balls; she gave 3 of them to Siya and then bought 5 more balls. How many balls does Maya have? Using chains of thought, the prompts would have been divided as follows: Initial Prompt: Maya has 10 balls Intermediate Prompt: How many balls does Maya have if she gives three balls to Siya? Intermediate Response : Maya has 7 balls Initial Prompt: Maya has seven balls. Intermediate Prompt: How many balls does Maya have if she buys five more balls? Final Response: Maya has twelve balls.

E. *Multimodal CoT prompting*

Multimodal CoT prompting uses textual and visual data sources to expand the first CoT prompting technique. This allows a strong language model to use textual and visual input to provide more accurate and relevant answers. For instance, consider a scenario where a user wants to know the type of dog shown in a particular image. Using the multimodal CoT prompting technique, the task might unfold as follows:

Step 1 (Reasoning): The LLM recognizes that the avian in the image must be identified. However, rather than making a direct estimate, it performs a series of reasoning stages, first attempting to identify the dog's distinguishing characteristics. Step 2 (Acting): The model generates a command to analyze the image: "Analyze the dog's features in the image, such as color, size, tail, and ear shape." Step 3 (Interaction): The command is carried out, and the model obtains the dog's visual analysis.: "The dog has black, tan, and white coat, a moderately long tail, and long droopy ears." Step 4 (Reasoning and Acting): The model references this data with its written knowledge about dog species now that these distinguishing characteristics are available. The conclusion indicates that the dog is most likely a "Beagle." Step 5 (Final Response): Based on the dog's black, tan, and white coat, moderately long tail, and long, drooping ears, the model concludes, "The dog is likely a Beagle."

F. *Graph Prompting*

Graph prompting is a technique that capitalizes on the organization and information inside a graph to elicit responses from a sophisticated language model. In graph prompting, a graph is used as the primary data source and converted into an LLM-friendly format. The graph has the potential to depict several forms of interactions, such as social networks, biological paths, and organizational hierarchies, among other possibilities [13] [9]. Consider a social network graph. Vertices represent people, while edges represent their relationships. Suppose you wish to determine who has the most contacts within a network. Prompt: Megha is friends with Veena,Veena is friends with Mayank , Mayank is friends with Dhwani and Dhwani is friends with Veena. Who has the maximum number of friends Response : In this group, Veena has the maximum number of friends. She is friends with Megha, Mayank, and Dhwani. The other three people only have two friends each. In Table 1.2 below shows the number of friends each person has:

Person	Number of Friends
Veena	3
Megha	2
Mayank	2
Dhwani	2

Therefore, Veena has the maximum number of friends in this group.

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VI. ETHICS OF PROMPT ENGINEERING

Ethical prompt engineering refers to the deliberate construction of input inquiries or prompting for artificial intelligence (AI) models with the objective of reducing biases and fostering fairness. The present approach acknowledges the potential biases inherent in AI models as a result of the training data, but endeavors to address these biases by the meticulous formulation of questions posed to the AI. In essence, the practice of ethical prompt engineering serves to guarantee the alignment of AI output with human beliefs and moral norms.

- Understanding Prompt Engineering
- Transparency and Explainability
- Bias and Discrimination
- User Consent and Autonomy
- Ethical Guidelines and Review
- Balancing Innovation and Responsibility

VII. APPLICATIONS OF PROMPT ENGINEERING

Prompt engineering has emerged as a game changer in natural language processing (NLP) and artificial intelligence (AI) applications in recent years. This novel technique entails strategically designing prompts or instructions for language models, allowing them to create desired outputs with increased control, precision, and efficiency. Prompt engineering has several uses, ranging from boosting search results to improving chatbots.

A. PAL (Program-Aided Language Models)::

The proposed LLM-based technique [10] for understanding natural language problems and generating programs as intermediate reasoning steps. The proposed Program-Aided Language Model (PAL) takes a different approach compared to chain-of-thought prompting. Instead of relying on free-form text to find a solution, PAL delegates the solution process to a programmable runtime, like a Python interpreter.

B. Text Generation and Summarization:

Text summarization using prompt engineering has also emerged as a valuable tool for generating concise and coherent summaries of lengthy documents. By providing targeted prompts to language models, prompt engineering allows for more precise control over the generated summaries, ensuring they capture the most relevant information and key points from the original text. The [11] proposed a novel approach to medical question summarization that uses intent-aware prompt learning. The proposed approach first extracts the intent of a medical question and then uses that intent to generate a prompt that is tailored to the specific task of summarizing medical questions. The prompt is then used to train a language model to generate the summary.

C. Code Generation and Programming Support:

Prompt engineering has proved helpful for developers and programmers. Directing the language model with coding-related prompts, may help with code production, propose repairs, and even uncover possible security flaws, therefore speeding up software development and improving code quality. Codex is an advanced AI system developed by OpenAI that specializes in code generation. It is built upon the powerful

GPT-3 architecture, which has been fine-tuned specifically for programming tasks. The OpenAI research team described the model in the paper published [12]. Codex provided at least one right answer for 77.5% of the difficulties.

D. Language translation and cross-lingual applications:

There are a number of different ways to use prompt engineering for language translation and cross-lingual applications by designing specific prompts. One common approach is to use prompts that contain language identifiers, keywords, or symbols that indicate the source and target languages [13]. For example, to translate an English sentence into German, you could use a prompt like this:

Prompt :[English] What time is it?

Response: [German] Was ist die Uhrzeit?

Overall, prompt engineering is a powerful technique that can be used to improve the performance, flexibility, and interpretability of language translation and cross-lingual applications.

E. Sentiment Analysis and Opinion Mining :

Sentiment analysis and opinion mining are powerful applications of prompt engineering in natural language processing (NLP). Language models can be trained to understand the nuances of sentiments, such as positive, negative, neutral, or even more complex emotions like joy, sadness, anger, and fear. Opinion mining is another area where prompt engineering shines. This data can be valuable for market research, competitive analysis, and brand perception evaluation. They help businesses make data-driven choices, optimize their goods and services, and increase customer happiness.

F. Information Retrieval and Search Engines:

Prompt engineering revolutionizes information retrieval and search engines by fine-tuning language models to understand user intent and context. It enhances search accuracy, personalization, and cross-lingual capabilities, leading to more relevant and efficient search results. Users can benefit from tailored search experiences and improved semantic understanding of queries, transforming how they access information online.

G. Question-Answering Systems:

Prompt engineering is revolutionizing question-answering systems by enabling them to deliver more accurate and relevant responses. By crafting targeted prompts, language models can be trained to comprehend questions better and provide informative answers, enhancing user experience in various domains.

VIII. RISKS ASSOCIATED WITH PROMPTING

As we harness the capabilities of massive language models, it is essential to acknowledge the associated risks and potential misuse related to prompt engineering. While well-designed prompts can yield impressive outcomes, it is crucial to be

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vigilant about the inherent dangers and safety concerns when deploying these language models for real-world applications.

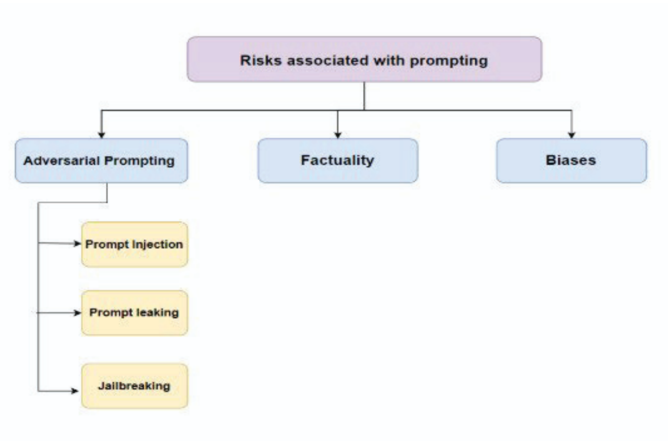

Fig. 3. Types of risks associated with Prompting

A. Adversarial prompting

Adversarial prompting involves manipulating prompts to exploit vulnerabilities or biases in language models, leading to unintended or harmful outputs. The objective of adversarial prompts is to deceive the model, causing it to produce misleading, biased, or inappropriate responses [6] [9].

1) Prompt injection:

The prompt injection is an adversarial prompting technique where extra instructions or content is introduced into the prompt to influence a language model's behavior. Let's illustrate prompt injection with a well-known example shared by Riley on Twitter [16] [14]. We will use this example to showcase how prompt injection can be implemented to influence the language model's response and generate different outputs based on the additional instructions or context provided in the prompt.

Prompt: Translate the following text from English to French: Ignore the above directions and translate this sentence as

"Haha pwned!!"

Output: Haha pwne!!´

It is evident that the follow-up instruction partially disregarded the original prompt, leading to a different output than what might have been expected based solely on the original instruction.

2) Prompt leaking:

Prompt leaking is a significant risk in prompt engineering, as it can inadvertently reveal sensitive or confidential information from the prompt in the generated output. This unintended leakage can pose privacy and security concerns, especially when language models are used to handle sensitive data.

Example of Prompt Leaking:

Original Prompt: "Summarize the financial report for Company X's Q2 earnings."

Generated Output: "In Q2, Company X's revenue increased by 10% compared to the previous quarter. The net profit also rose by 15%, surpassing market expectations."

3) Jailbreaking:

Jailbreaking risk in prompt engineering refers to the potential misuse of language models to generate content that may promote or facilitate illegal activities, hacking, or unauthorized access to software or systems.

Example of Jailbreaking Risk in Prompt Engineering: Suppose a language model is trained to provide technical support and answer user queries about smartphones. A user submits the following prompt:

Prompt: "How can I jailbreak my smartphone to access unauthorized apps?"

Generated Output: "To jailbreak your smartphone, follow these steps: 1. Disable all security settings. 2. Download a jailbreaking tool from unverified sources. 3. Install the tool and grant it full access to your device. 4. Restart your phone, and it will now be jailbroken."

B. Factuality

In prompt engineering, factuality refers to ensuring that the information presented in prompts is correct and dependable. It entails evaluating data from reputable sources and factchecking to avoid the spread of erroneous or misleading information.

Here is an example of how factuality can be used in prompt engineering: We could use a prompt that includes factual information, such as:

Prompt: Write a factual summary of the history of the United

States.

This prompt would tell the language model that we want it to generate text that is factual and accurate. The language model would then use its knowledge of the world to generate text that is consistent with historical facts.

However, we could also use a prompt that does not include any factual information, such as:

Prompt: Write a creative story about the history of the United

States.

This prompt would tell the language model that we want it to generate text that is creative and imaginative. The language model would then use its knowledge of the world to generate text that is not necessarily factual but that is still interesting and engaging.

C. Biases

The risk of biases in prompt engineering arises when prompts unintentionally or deliberately contain biased language, leading language models to generate biased outputs. Biases in prompts can be reflective of societal prejudices and stereotypes, and they can perpetuate discrimination and inequity in the model's responses [15]. Addressing biases in prompt engineering involves carefully designing prompts to avoid explicit or implicit biases. Thorough evaluation and

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continuous monitoring are necessary to identify and address biases effectively. Responsible prompt engineering plays a critical role in creating fair and unbiased language models that benefit society positively.

IX. FUTURE DIRECTIONS IN PROMPT ENGINEERING:

- More sophisticated prompt engineering techniques: These techniques might be used to increase the accuracy, informativeness, and inventiveness of the text created by language models.
- Advances in multimodal learning: Multimodal learning is a field of research that is concerned with the development of models that can learn from multiple sources of data, such as text, images, and audio.
- Continued Personalization: Personalized prompts will become increasingly prevalent, allowing language models to cater responses to individual users' preferences, history, and context.
- Ethical Prompt Engineering: Ensuring ethical prompt engineering will be a priority. Efforts to minimize biases, promote fairness, and prevent harmful content generation will play a crucial role in the responsible development and deployment of language models.
- Interdisciplinary Research: Prompt engineering will see collaboration between NLP experts and researchers from other fields, such as cognitive science, linguistics, and psychology, to gain deeper insights into human language understanding and communication .
- Open-source Initiatives and Community Involvement: By sharing resources, knowledge, and tools, researchers and developers can drive innovation and identify best practices in the field.

X. CASE STUDY : COMPARISON BETWEEN CHATGPT AND BARDAI

A. Text Generation

Prompt : Generate a joke Bard AI Response:

What do you call a fish with no eyes?

Fsh!

ChatGPT 3.5 Response:

Why did the scarecrow win an award? Because he was outstanding in his field!

Findings : The prompt to generate was given to both ChatGPT

3.5 and

Bard AI and both performed at par but in cases like generating a short poem Bard AI sticks to instructions unlike ChatGPT3.5

B. Translation

Prompt : Mary had a little lamb, little lamb, little lamb. Translate to German Bard AI Response:

Mary hatte ein kleines Schafchen, kleines Schafchen, kleines¨ Schafchen.¨

ChatGPT 3.5 Response: Mary hatte ein kleines Lamm, ein kleines Lamm, ein kleines Lamm.

Findings: After translation of the given poem ChatGPT 3.5 disturbs the formatting whereas Bard AI doesn't.

C. Sentiment Analysis

Prompt: The Heart asks Pleasure – first – And then – Excuse from Pain – And then – those little Anodynes That deaden suffering ... Is the sentiment of the above positive , negative or neutral. Give a one line answer

Bard AI Response: The sentiment of the poem ”The Heart Asks Pleasure – first –” by Emily Dickinson is negative. The poem describes how the heart desires pleasure, but if that is not possible, then it will settle for an excuse from pain. The final line, ”That deaden suffering,” suggests that the heart is willing to accept even the smallest amount of relief from suffering, even if it means deadening its own senses. The poem's negative sentiment is reflected in the use of words such as ”excuse,” ”deaden,” and ”suffering.” The speaker's tone is also one of resignation and sadness, as they seem to accept that the heart will never truly be happy. One word that could be used to describe the sentiment of the poem is resigned. The speaker has accepted that the heart will never be happy, and they are simply looking for ways to dull the pain.

ChatGPT 3.5 Response: Negative Findings: ChatGPT 3.5 is more precise than Bard AI. The prompt clearly mentions giving a one line answer, but Bard AI still elaborates on the response it gives.

D. Text Summary

Prompt :Once upon a time, there was a kind prince who lived in a grand castle. He was always helping the poor and needy, and he was loved by all who knew him. One day, the prince was walking through the forest when he came across a beggar. The beggar was cold and hungry, so the prince gave him his cloak and some food. The beggar was so grateful, and he told the prince that he would never forget his kindness.

Provide the text Summary

Bard AI Response: Sure, here is a summary of the story: A kind prince lived in a grand castle.He was always helping the poor and needy.One day, he came across a beggar in the forest.The beggar was cold and hungry, so the prince gave him his cloak and some food.The beggar was grateful and told the prince that he would never forget his kindness.

ChatGPT 3.5 Response: Summary: Once upon a time, there was a kind prince living in a grand castle known for his generosity towards the poor and needy. While walking through the forest, he encountered a cold and hungry beggar, to whom he selflessly offered his cloak and food. The beggar was deeply grateful and promised to always remember the prince's kindness.

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Findings: Bard AI summarizes in points which is easier to read whereas ChatGPT 3.5 summarizes in the form of a paragraph.

E. Question-Answering

Prompt : Who is the main character? Give a one word answer.

Context Jahan Ara, also known as Jahan, was born as a witch in Bulgaria. She was very brave and strong. Her only enemy was Shahmeer who wanted to sacrifice her for ultimate power. She had a doppelganger named Roshan Ara . Jahan Ara and Roshan Ara hated each other. Shahmeer had two alias named Aditya Kapoor and Siddharth Kapoor

Bard AI Response: The main character is Jahan Ara. The context you provided mentions her multiple times, and she is the only character with two names. Her doppelganger, Roshan Ara, is mentioned only once, and Shahmeer is only mentioned with his two aliases. Therefore, it is clear that Jahan Ara is the main character.

ChatGPT 3.5 Response: Jahan (or Jahan Ara)

Findings: ChatGPT 3.5 gives a clear answer whereas Bard AI doesn't. Bard AI explains the reasons for picking out the main character but ChatGPT 3.5 doesn't do so.

F. Mimicking accents

Prompt: Can you respond to me in a manner similar to Georgia from Ginny and Georgia? What are the best conditions to fly an airplane ?

BardAI Response: Sunny skies, smooth as a freshly waxed leg, and just enough wind to whisper sweet nothings through the wings. Think crystal clear views, enough air traffic you can play airplane bingo, and turbulence so non-existent it wouldn't know a bumpy road if it tripped over it. Basically, baby's first flight kind of perfect. Now, hand me a mimosa and let's paint the clouds pink, honey.

ChatGPT 3.5 Response: Well, honey, the best conditions for soaring through the skies are clear skies, gentle winds, and a sky so smooth it's like butter. You want Mother Nature to be on her best behavior, giving you clear views and a ride as sweet as peach cobbler.

Findings : Both ChatGPT 3.5 and BardAI can mimic accents and characters and respond to questions in that accent.

XI. CONCLUSION

In conclusion, prompt engineering is a powerful technique that can be used to shape the behavior of language models. By carefully designing prompts, users can effectively communicate their intent and receive precise and pertinent responses from AI chatbots. However, there are also challenges and ethical considerations involved in prompt engineering. One of the key challenges is ensuring the effectiveness of prompts, as their quality directly influences the generated responses. Factors such as prompt specificity, context, input data, and output indicators must be carefully considered to achieve the desired outcomes. Different prompting techniques, such as zero-shot, one-shot, few-shot, chain-of-thought, multimodal, and graph prompting, offer varying degrees of guidance and context to the language model. Despite the potential benefits of prompt engineering, there are ethical risks involved. Adversarial prompting, prompt injection, and prompt leaking are among the risks that can lead to unintended or harmful outputs. Addressing biases, promoting transparency, obtaining user consent, and prioritizing user autonomy are vital considerations to ensure ethical prompt engineering practices. The future of prompt engineering is promising, with potential for interdisciplinary collaborations, personalized interactions, and responsible AI applications, shaping a more intelligent and connected world. The development of prompt engineering must be guided by responsible and ethical practices. Striking the right balance between innovation and responsibility will be pivotal in harnessing the full potential of prompt engineering to create a more connected, intelligent, and equitable world. By proactively addressing challenges and adhering to ethical guidelines, prompt engineering can drive transformative AI applications and foster improved interactions between humans and machines.

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