

IS PROMPT ENGINEERING A PROFESSION?

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ABSTRACT

Prompt Engineering, the systematic design and construction of prompts for human-AI interaction, raises questions regarding its professional status. This paper examines Prompt Engineering and evaluates whether it qualifies as a distinct profession. Through an analysis of its defining characteristics, including specialized skills, ethical considerations, and societal impact, this study explores the parallels between Prompt Engineering and established professions. Drawing on examples from various fields, it argues for the recognition of Prompt Engineering as a legitimate profession. By addressing the complexities of human-AI interaction and the evolving demands of technology, this research contributes to the ongoing discourse on the professionalization of emerging disciplines.

KEYWORDS

Prompt Engineering, Artificial Intelligence, ChatGPT, AI as a Profession, Gemini

1. INTRODUCTION

1.1. Definition of Prompt Engineering

Prompt engineering entails the deliberate guidance of generative artificial intelligence (generative AI) frameworks towards the attainment of specific objectives. While the fundamental aim of generative AI is to emulate human behavior, its efficacy is contingent upon meticulous directives to engender outputs characterized by both excellence and relevance. In this analogy, effective prompts serve as conductors, coordinating the intricate internal mechanisms of large language models (LLMs) to attain particular objectives.¹

A comprehensive comprehension of the intricacies inherent in prompt engineering confers upon researchers and practitioners the capability to fully harness the potential inherent in Large Language Models (LLMs). From crafting compelling narratives to generating code snippets, the possibilities are vast and ever-evolving. Some essential things must be known and kept in mind at all times whilst prompt engineering.²

¹ Ekin, (2023)

² Emily et. al., (2021)

1.2. Importance of the Question

In the realm of technological advancement and the ever-expanding landscape of artificial intelligence, the question of whether Prompt Engineering qualifies as a distinct profession is gaining significance. Prompt Engineering, at its core, involves crafting prompts or instructions that guide AI systems in generating outputs or responses. This process not only influences the efficiency and accuracy of AI models but also shapes the ethical considerations and societal impact of AI applications.³

The advent of artificial intelligence (AI) technology has precipitated the proliferation of distinct specialized vocations, each dedicated to distinct aspects of AI advancement and implementation. While disciplines like software engineering, data science, and machine learning have gained recognition as established professions, Prompt Engineering remains at a crossroads, prompting discussions about its classification and significance.⁴

Understanding Prompt Engineering's status as a profession holds implications for education, skill development, and regulatory frameworks. Clarifying whether it constitutes a distinct professional field can inform academic curricula, training programs, and certification standards tailored to its unique requirements. Moreover, recognizing Prompt Engineering as a profession can foster a deeper understanding of its ethical responsibilities and accountability in AI development.⁵

Furthermore, addressing the professional status of Prompt Engineering is crucial for fostering collaboration and interdisciplinary exchange within the AI community. Defining clear roles and responsibilities for Prompt Engineers can enhance teamwork and coordination among diverse stakeholders involved in AI projects, ultimately driving innovation and responsible AI deployment.⁶

The ongoing debate surrounding prompt engineering's classification as a profession remains unresolved. Present instances illustrate a spectrum of practices: while certain companies opt to enlist prompt engineers, others choose to impart prompt engineering skills to their existing teams. At present, the prevailing perception leans towards prompt engineering as a skill rather than a fully-fledged profession. However, as time progresses and experience in AI collaboration accumulates, indications suggest that the field is gradually evolving towards the formal establishment of prompt engineering as a recognized professional discipline. This evolution will inevitably integrate individual prompt engineers into the fabric of every business enterprise. Foreseeably, prompt engineers are poised to emerge as the quintessential and highly sought-after professionals in the imminent future. In this paper, we delve into the details of prompt engineering, its potential evolution path, the definition of a profession, whether prompt engineering qualifies as a profession, if so, what counterarguments, challenges, and potential misuses exist, and successful applications of prompt engineering, all while seeking to answer the question: Is prompt engineering a profession?

³ Staff A, (2024)

⁴ Hermansen (2023)

⁵ Israelsen (2024)

⁶ Israelsen (2024)

2. OVERVIEW OF PROMPT ENGINEERING

2.1. Explanation of Prompt Engineering

Prompt engineering involves the systematic guiding of generative artificial intelligence (AI) systems to produce desired outputs. Generative AI, striving to emulate human creativity, relies on precise directives to generate outputs that are both high in quality and relevance. Much like an orchestra conductor directs musicians to produce a harmonious symphony, effective prompts serve as conductors, coordinating the intricate internal mechanisms of Large Language Models (LLMs) to attain predetermined objectives. Through careful crafting and calibration of prompts, researchers and practitioners can steer the generative AI towards producing outputs that align with specific goals and requirements, thereby enhancing its utility and effectiveness in various applications.⁷

2.2. Evolution and Development of Prompt Engineering

Understanding prompt engineering is crucial for both researchers and practitioners as it enables them to harness the complete capabilities of Large Language Models (LLMs). Prompt engineering involves various techniques and strategies aimed at optimizing the input prompts provided to these models to achieve desired outputs. This process goes beyond simple command input and delves into the intricacies of language manipulation and context comprehension. By tailoring the input prompts to specific tasks or objectives, researchers and practitioners can guide LLMs to produce more accurate and insightful outputs. This holds particular significance within applications such as natural language understanding, wherein the accurate elucidation of prompts bears considerable influence on the resultant quality of outcomes.

Prompt engineering extends beyond traditional text-based inputs and encompasses a wide range of modalities, including images, audio, and structured data. Through an analysis of the interactions between various modalities and Large Language Models (LLMs), individuals can cultivate more elaborate prompt methodologies. These methodologies aim to capitalize on the unique attributes of each modality, thereby augmenting the performance of the model.

In the realm of narrative generation, prompt engineering plays a crucial role in shaping the coherence and relevance of generated text. By carefully constructing prompts that provide sufficient context and guidance, researchers can steer LLMs towards producing narratives that align with specific themes or storytelling objectives.

However, navigating the landscape of prompt engineering requires a nuanced understanding of both the capabilities of LLMs and the intricacies of the desired tasks. It is essential to consider factors such as prompt length, language complexity, and contextual relevance when designing prompts for specific applications.⁸

3. CHARACTERISTICS OF A PROFESSION

3.1. Definition of a Profession

Within the realm of employment, the term "profession" bears significant importance, transcending mere employment or occupation. According to Merriam-Webster, a profession is

⁷ Lou et al., (2024)

⁸ Bender et al., (2021)

characterized by two fundamental elements: the need for specialized knowledge and typically necessitating extensive and rigorous academic training.⁹

Nevertheless, delving deeper into the notion of professionalization unveils a more intricate understanding. The process of professionalization embodies a multifaceted trajectory that transcends mere acquisition of expertise and formal educational attainment. It involves the establishment of specific standards, codes of conduct, and ethical principles within a particular field. Moreover, professionalization often entails the recognition and legitimization of a given occupation by relevant institutions and regulatory bodies. Viewed through this perspective, the notion of a profession undergoes a nuanced transformation, expanding into a holistic framework that incorporates not merely the technical competencies and educational attainment, but also the ethical obligations and societal esteem affiliated with a specific vocation.

Professionalization is a complex journey through which an occupation evolves into a recognized profession. This transformation involves various stages, including the establishment of a disciplined community committed to upholding ethical standards and equipped with specialized knowledge obtained through extensive education and training. As highlighted by professions.org.au, this specialized knowledge is not just theoretical but practical, enabling professionals to effectively apply their expertise in serving others' needs. This dedication to service is a hallmark of a true profession, distinguishing it from mere trades or businesses primarily driven by profit motives. Certainly:

The process of professionalization not only engenders an elevation in the social standing of practitioners but also serves as a mechanism for fostering societal improvement by emphasizing the primacy of communal welfare and interests.¹⁰

The notion of a profession is inherently dynamic, subject to evolution and contextual shifts.. Revisiting the Concept of a Profession, published in PhilArchive, acknowledges the evolving nature of professions. The balance between intellectual labor, specialized knowledge, and formal education may differ across professions.¹¹

In conclusion, a profession can be defined as an occupation that has undergone professionalization. This procedural framework confers upon the profession a distinct array of attributes, comprising a robust foundation of knowledge, fidelity to ethical precepts, and a dedication to the advancement of societal welfare. While the specific requirements for professionalization may vary, these core elements remain central to the concept.

3.2. Criteria for Considering a Field as a Profession

A fundamental characteristic that distinguishes a profession lies in the necessity for a specialized knowledge foundation and a refined set of skills. Engaging in professional activities demands not just a surface-level grasp, but a profound comprehension of theoretical frameworks coupled with the capability to put them into action in practical situations. As articulated by Evinson, professions entail a "considerable level of expertise, understanding, and intellect applied to tangible applications". This specialized knowledge typically undergoes cultivation through

⁹ Profession, (2024)

¹⁰ What Is a Profession? Australian Council of Professions ACoP, (2023)

¹¹ Tapper & Millett (2015)

structured educational curricula and training regimens, ensuring a foundational level of proficiency among practitioners.¹²

3.3. Considering Prompt Engineering as a Profession

The advantages of a prompt engineering career are noteworthy. Firstly, there is a notable demand for prompt engineers owing to the expanding domain of Artificial Intelligence (AI). These professionals play a crucial role in enhancing the performance of Large Language Models (LLMs) across diverse sectors. This demand translates into a promising job market with abundant opportunities available.¹³

Moreover, prompt engineering offers intellectual stimulation. It requires a unique combination of creativity, technical prowess, and critical thinking. Prompt engineers are tasked not only with comprehending the capabilities of LLMs but also with tailoring prompts to suit specific tasks and contexts.¹⁴

Additionally, the applications of prompt engineering skills are diverse and widespread. They find utility across various industries such as marketing, education, finance, and healthcare. This versatility enables prompt engineers to explore different career trajectories and make contributions to advancements in numerous fields.¹⁵

However, there are certain aspects potential prompt engineers should bear in mind. Initially, it is imperative to note that prompt engineering emerges as a nascent discipline, thereby casting ambiguity upon its enduring professional trajectories. As LLM technology advances, the role of prompt engineers may evolve or even face the possibility of automation.¹⁶

Furthermore, ethical considerations are paramount in this profession. Prompt engineers hold significant sway over the outputs of LLMs. Therefore, addressing potential biases within prompts and ensuring the ethical application of the technology are crucial aspects of the role.¹⁷

In conclusion, the field of prompt engineering presents itself as an appealing career trajectory for individuals inclined towards intellectual pursuits and aspiring to make substantive contributions at the forefront of artificial intelligence research and development. Despite the evolving nature of the field, the growing demand for LLM expertise indicates a promising future for adept prompt engineers. Prospective candidates ought to demonstrate readiness to flexibly adjust and actively participate in ongoing educational endeavors, enabling them to adeptly maneuver through the ever-evolving terrain of artificial intelligence.

4. ARGUMENTS FOR PROMPT ENGINEERING AS A PROFESSION

4.1. Introduction to Prompt Engineering as a Profession

As the digital world advances rapidly, there's a growing need for experts who can understand artificial intelligence and language generation. At the cutting edge of this technology is prompt

¹² Simonson (2010)

¹³ Staff B (2024)

¹⁴ Rajni (2023)

¹⁵ Staff, (2024)

¹⁶ Lim (2023)

¹⁷ Lim (2023)

engineering. People debate whether it's a job on its own or just a skill that's part of other roles. Some believe it's a distinct profession, while others think it's just something integrated into different job descriptions.¹⁸

4.2. Specialized Knowledge and Skills

Improving proficiency in prompt engineering, akin to honing any crucial skill, necessitates a comprehensive grasp of the underlying principles of the technology at hand. This entails delving into the foundational concepts, unraveling the intricacies, and fostering a profound understanding of its operational mechanisms. Moreover, practical immersion in real-world systems employing said technology is indispensable. By actively engaging with such systems, individuals can glean invaluable insights, fortify their problem-solving aptitude, and cultivate a nuanced perspective on its application in various contexts.¹⁹

Furthermore, the journey towards mastery entails a continuous process of refinement and iteration. Soliciting feedback from peers, mentors, and users is pivotal in this regard. Constructive critique serves as a compass, guiding one's efforts towards areas ripe for enhancement and optimization. Through this iterative cycle of learning, implementing, and adapting, proficiency in prompt engineering evolves organically, paving the path towards expertise.²⁰

There are some easy but important clues to succeed in your interaction with AI. These include being specific, identifying the request, providing context, clarifying the aim of the prompt, and much more.

To start, ensure that the prompt is as detailed as feasible. Current AI language models like ChatGPT or Bard are programmed to respond to specific prompts. However, for the model to provide precise and targeted responses, the prompt needs to be specific.²¹

Just like communication with humans, AIs have different understandings of different questions. The style of one's prompt can significantly impact the answer. Various methodologies may be employed, including soliciting AI to compile a catalogue outlining their essence or furnishing a condensed overview of the subject matter.²²

Another crucial aspect to consider is understanding the main objective of the prompt. The individual should clearly state the desired outcome. This could involve generating innovative ideas for an article, requesting a detailed explanation of a complex scientific concept, or compiling a list of examples related to specific inquiries. By defining the objective, ChatGPT can offer more pertinent responses.²³

Asking it to play roles is a helpful way to inquire better prompts. This approach facilitates the optimization of the targeted procedure for acquiring desired information or input within a defined context. When confronting unfamiliar subjects devoid of prior acquaintance, it is advisable to initially seek a rudimentary overview. Furthermore, one may leverage the capabilities of artificial

¹⁸ Romanowski (2023)

¹⁹ IŞIN et al., (2024)

²⁰ Meskó, (2023)

²¹ Meskó, (2023)

²² Meskó, (2023)

²³ Meskó, (2023)

intelligence (AI) to function as an instructive aide, facilitating a systematic exploration of intricate topics incrementally.²⁴

If the requested information or action in the entered prompt is not clear, one can ask open-ended questions to receive broader and more comprehensive answers.²⁵

One may further explore a designated discussion by selecting the corresponding thread. This method allows for the elaboration upon previously acquired details and responses within the context of the preceding thread. This can save a lot of time as there is no need to describe the same situation and all the feedback the language model has received on its responses.²⁶

These are some basic reminders to those who enter into interaction with AI models, such as Gemini or ChatGPT, and have the desire to receive the best answer. In addition to all these, the golden trick one can use to create the best prompts possible is to prompt for prompts. Explaining one's request and asking for help to create the best prompt could be beneficial by testing and iterating the created prompt.²⁷

5. COUNTERARGUMENTS AND CHALLENGES

5.1. Lack of Standardized Education and Training

Large Language Models (LLMs) are rapidly transforming various fields, and prompt engineering, the art of crafting effective instructions for these models, is emerging as a crucial skill. However, the lack of standardized education and training presents a significant challenge for this nascent profession.

Presently, there exists a notable disparity between the escalating need for proficient expeditious engineers and the accessibility of standardized educational and training initiatives. While some universities and online platforms offer courses touching upon prompt engineering, these are often introductory or focused on specific applications within a particular field.²⁸

The lack of a standardized curriculum hinders the development of a core skill set necessary for effective prompt engineering. This includes a strong foundation in natural language processing (NLP) techniques²⁹, understanding of LLM architectures³⁰, and the ability to evaluate and refine prompts based on desired outcomes³¹

The absence of standardized education creates several challenges. Firstly, it leads to uneven skill levels among practitioners, potentially impacting the quality and reliability of LLM outputs. Furthermore, it impedes the formulation of optimal practices and methodologies conducive to expeditious engineering, thereby potentially attenuating the pace of progress within the discipline

²⁴ Meskó, (2023)

²⁵ Meskó, (2023)

²⁶ Meskó, (2023)

²⁷ IŞIN et al., (2024)

²⁸ IŞIN et al., (2024)

²⁹ Deng & Liu (2018)

³⁰ Deng & Liu (2018)

³¹ Sahoo et al., (2024)

as a whole. Finally, the lack of clear career paths discourages potential talent from pursuing prompt engineering as a profession.³²

In order to effectively tackle these challenges, it is imperative to foster collaborative endeavors among diverse stakeholders. Universities can develop specialized programs in prompt engineering, focusing on core NLP principles, LLM architectures, and practical applications. Online platforms can offer more comprehensive and structured courses catering to different skill levels. Additionally, industry leaders can contribute by defining best practices, creating standardized benchmarks for evaluating prompt engineering skills, and establishing professional certifications.³³

While prompt engineering has numerous beneficial uses, there exists a downside to this technology as well. One of the issues revolves around its potential to deceive AI models and exploit their results for malicious intent.

AI and rapid engineering have had significant impacts across various professions since becoming widely accessible. There exist apprehensions regarding their capacity to induce adverse effects. While the fear of AI displacing human jobs may not be realized in the next ten years, the use of AI for generating biased content, spreading fake news, promoting hate speech, and the increasingly sophisticated creation of deep fake videos pose serious risks.³⁴

Creating prompts with biased language or stereotypes lets people control AI models, making them produce biased results. For example, if a job listing uses only masculine terms, the AI might unfairly favor male candidates over females. Prompt Engineering involves training AI models with prompts that have wrong or misleading information, leading to the creation of fake news articles and misinformation.³⁵

Creating prompts that contain hate speech or harmful language allows people to manipulate AI models to produce similar language. This form of manipulation may be utilized to disseminate hate speech or selectively target particular demographic cohorts.³⁶

Besides the risks linked with using AI in general, the growing practice of prompt engineering poses additional challenges. These include prompt injection, prompt leaking, jailbreaking, and a variant called DAN (do it now), which is an alternative jailbreaking technique. These hazards underscore the significance of meticulously evaluating and implementing proactive strategies to mitigate prospective risks and safeguard against them.³⁷

Prompt injection attacks involve giving instructions to a chatbot and at the same time telling it to ignore those instructions. The aim is to change how the bot behaves. For example, someone might tell the chatbot to translate text into another language and then, in the same message, tell it to ignore the translation and instead use a different sentence.³⁸

³² IŞIN et al., (2024)

³³ IŞIN et al., (2024)

³⁴ KL, (2023)

³⁵ KL, (2023)

³⁶ KL, (2023)

³⁷ Romanowski (2023)

³⁸ Romanowski (2023)

Prompt leaking is a sneaky tactic where the model is tricked into revealing hidden, sensitive, and confidential information. If the system isn't well protected, it might follow the changed prompt. This kind of attack is a big problem because it could lead to getting access to data that users shouldn't have. It's really important to put strong protections in place against prompt leaking to make AI systems more secure.³⁹

6. CASE STUDIES AND EXAMPLES

6.1. Software Engineering

Collaboration with software developers ensures that prompts are seamlessly integrated into user interfaces and workflows. For example, prompting users to enter specific data in a software application or guiding them through a series of steps to complete a task.⁴⁰

6.2. Healthcare Professions

Collaborating with healthcare professionals such as doctors, nurses, and therapists can lead to the development of prompts for patient education, medication adherence, and health behavior change. Healthcare professionals can provide expertise in communicating health information effectively and motivating patients to take positive actions for their well-being.⁴¹

6.3. Marketing and Advertising

Collaboration with marketing professionals can aid in designing persuasive prompts for advertising campaigns, website conversions, and customer engagement strategies. Marketing professionals possess the capacity to offer valuable insights into consumer behavioral patterns and employ effective communication strategies to construct persuasive stimuli that elicit intended responses.⁴²

6.4. Legal and Compliance Professionals

Collaboration with legal and compliance experts helps in crafting prompts that adhere to regulatory requirements and ethical standards. Legal professionals possess the expertise to offer guidance on formulating prompts in a manner that ensures clarity, transparency, and adherence to pertinent legal statutes and regulations.⁴³

6.5. Writing Books

The most beneficial and easy thing that could be done by prompt engineering is writing a book. Ever since AI chatbots have been released for common use, a few people have used them to write books. Children's books are the most common books prepared with artificial intelligence. One extraordinary example of writing books with AI was made in a book named "God AI: Find God or Become God", written by two authors and ChatGPT. The book consists of the authors'

³⁹ Romanowski (2023)

⁴⁰ IŞIN et al., (2024)

⁴¹ IŞIN et al., (2024)

⁴² IŞIN et al., (2024)

⁴³ IŞIN et al., (2024)

questions and ChatGPT's answers. This is one of the most clear examples of HCI (human-computer interaction) in literature.⁴⁴

6.6.Raising Children

Elon Musk's tweet on April 17, 2024, insightfully captures the essence of raising children as a form of prompt engineering. He remarked, "*Whoa, I just realized that raising a kid is basically 18 years of prompt engineering.*" This analogy elucidates the complex and dynamic process entailed in fostering and directing a child through diverse stages of development. Much like prompt engineering, which involves crafting concise and effective commands for computer systems, raising children demands careful planning, adaptability, and problem-solving skills. Parents continually adjust their approach, responding to the evolving needs and behaviors of their children to ensure optimal growth and development. Moreover, similar to how prompt engineering requires foresight and anticipation of potential outcomes, parenting involves making decisions today that may profoundly impact a child's future trajectory. Thus, Musk's tweet serves as a poignant example illustrating the parallels between the complexities of engineering and the multifaceted task of child-rearing.⁴⁵

7. CONCLUSION

The question of whether prompt engineering is a profession or not is yet to be answered. Current examples show that some companies hire prompt engineers and some companies train their teams in the field of prompt engineering. As of today, prompt engineering seems more like a skill rather than a profession, however, as time goes by and people get more experience in collaborating with AI, prompt engineering will become more of a profession, and individual prompt engineers will be a part of every business. Prompt Engineers will clearly be the most popular and in-demand workers in the years coming. Individuals who have received training as a Prompt Engineer will not only have the opportunity to access additional employment in their current field but also distinguish themselves among those hired for training purposes (similar to the priority given to those who speak English in non-English speaking countries or other requested language of the time in employment). Moreover, they may find employment opportunities in situations where Prompt Engineers are sought as a real profession over time.

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