

# ChatGPT and prompting framework.

VAJRATIYA VAJBOL,

<sup>1</sup>International Center for AI and Cyber Security Research and Innovations. Asia University, Taiwan.

(e-mail: tiya101@south.du.ac.in).

**ABSTRACT** ChatGPT give users directions on how to change and adjust the model's responses. Users can get ChatGPT to produce results that are specific to their needs, preferences, or the task at hand by giving it clear instructions. This article goes over ChatGPT and prompting systems in detail. It talks about the GPT-3.5 design, the suggestion system, and the purpose of prompts. It talks about the architecture's good points in understanding words and remembering context, while also pointing out problems like uncertainty. The piece imagines how ChatGPT could get better in the future, with a focus on better context knowledge and social concerns. At the end, there is a call to action for creators to make ethical AI creation a priority.

⋮ **KEYWORDS** ChatGPT, Prompt, Prompt Engineer, Conversation AI

## I. Introduction

ChatGPT is a groundbreaking language model built on the GPT-3.5 architecture, which is the most advanced design in the field of natural language processing (NLP). GPT-3.5, which stands for "Generative Pre-trained Transformer 3.5," is based on a transformer design that is very good at reading and writing text that sounds like talking. Since it was designed to efficiently parallelize operations, it is very good at handling difficult language jobs. Using Natural Language Processing (NLP) is important for building ChatGPT because it lets computers understand, read, and write text that sounds like it was written by a person. This makes it easier for them to have meaningful talks that are relevant to the situation. Many areas use NLP, from chatbots and virtual helpers to content creation and difficult language understanding jobs [1].

ChatGPT's advice system is a key part of making it easier for users to connect with the model optimally. Offering ideas, the system helps users come up with better questions, which leads to the desired model outputs. As a result, users can benefit from prompts that are more precise, clear, and relevant to their wants or jobs. Modifying model results through the suggestion system is necessary to make answers fit what the user wants, which makes the exchange more useful and efficient. This feature automatically changes the answers of ChatGPT to fit different situations, like when people are writing creatively, fixing problems, or looking for information [2].

The structure for prompts is a key part of how people connect with language models like ChatGPT. Its main job is to give users an organized way to enter specific directions or questions that change how the model responds [3]. By setting up prompts—short directions or questions that users give to

the model—this framework makes it possible to customize the results that ChatGPT produces. Customization is very important because it lets users guide the model to the results, they want by changing how it responds to different situations or preferences. Beyond just interacting, the asking structure is very important because it gives users a powerful way to use ChatGPT's features for many different tasks, such as understanding natural language, creating content, and more.

This article examines the GPT-3.5 architecture of ChatGPT, focusing on its notable abilities in language comprehension and contextual memory. The article explores the crucial significance of well-constructed prompts in tailoring model outputs and emphasizes the difficulties posed by factors such as ambiguity and biases. It anticipates forthcoming advancements, such as heightened contextual comprehension and ethical deliberations. The text ends by urging developers to give priority to ethics and actively participate in ethically navigating the transformational field of AI through collaboration.

## II. Architecture for ChatGPT

Generative Pre-trained Transformer 3.5, or GPT-3.5, is a new kind of neural network model for processing natural text. It is based on the Transformer design. Parallelization of computation is at the heart of the Transformer design. This makes training more efficient and improves speed. Attention systems are very important in GPT-3.5. These features let the model focus on certain parts of input patterns, picking up on the complex connections between words and their surroundings [4]. This focus-based method gives GPT-3.5 an unmatched ability to understand and write text that sounds like it was written by a person. The method for training includes pre-training on very large datasets, which expose the model to a wide range of language patterns and

situations. This model is already learned, but it can be fine-tuned for specific tasks or areas. This makes it useful in a wide range of natural language understanding and generation tasks.

There are some amazing things about the GPT-3.5 model that make it stand out in the field of natural language processing.

- The transformer-based design of GPT-3.5 makes it very good at understanding words. The attention systems help the model understand the subtleties of meaning and how they relate to other parts of a sentence [5]. A lot of pre-training on different datasets gives the model a wide range of linguistic knowledge, which lets it understand user inputs and searches accurately across many areas.
- One great thing about GPT-3.5 is that it can keep track of context even when reading long sections of text. The architecture's attention mechanisms help the model remember important details, so it can keep a clear picture of what's going on in a talk or paper [6]. This ability to remember the context is a big part of the model's ability to come up with answers that make sense in the given situation.

GPT-3.5 is very powerful, but it does have some problems. It's possible that the model will respond differently depending on how the information is phrased. Also, it might come up with results that seem reasonable but aren't based on facts. Also, GPT-3.5 might have trouble with complex or unclear questions, and it could unintentionally reinforce biases found in the training data [7, 8]. It is important for users and writers to be aware of these limits so that they can use the model wisely and know what problems it might cause in some situations.

Overall, GPT-3.5's language understanding, context memory, and detailed answer generation show how good it is at natural language processing. At the same time, it knows that its use comes with some limits and challenges that need to be addressed.

### III. The Role of Prompting Frameworks

For the most part, prompts are questions or instructions given by the user that tell the language model what to do. They can be anything from simple one-sentence instructions to longer paragraphs. The way a prompt is put together is very important because it affects how clear and detailed the instructions are that are given to the model [9]. Well-written questions make it clear what the user wants, which leads to more accurate and appropriate answers.

To fully understand prompts, one must first understand what they are, how they are put together, and how they affect the way users deal with advanced language models like GPT-3.5.

With models like GPT-3.5, the ability to customize messages is a key benefit that lets users shape answers to meet specific needs.

- **Tailoring Responses to Specific Question**

By writing prompts that give clear and exact directions, users can fine-tune the output of GPT-3.5. Customization is the art of coming up with prompts that direct the model's language generation process in the direction you want it to go. Users can successfully direct the model to produce outputs that match their personal tastes or the needs of a specific job by stating the style, tone, or content that they expect in the answer [10].

- **Some examples of good prompts**

There should be a mix between precision and clarity in good prompts. Giving the model a prompt like "Write a creative story about space exploration with a positive tone" for example guides the language generation toward a specific result that is wanted. Similarly, asking structured questions of the model, like "Solve the following math problem step by step," shows how users can use hints to get focused and methodical answers. As you can see, these examples show how prompts can be used to change results in artistic, helpful, or problem-solving areas [11].

By learning how to change answers through questions, users can get the most out of GPT-3.5 and turn it into a useful tool for a wide range of tasks. The full customization potential and advanced language model powers can be used by users once they master the art of writing effective questions.

## IV. Challenges and Considerations

- **Ambiguity and Unpredictability**

It's hard to know what to do when the user's purpose isn't clear from the prompts or isn't expected. Ambiguity can lead to different readings, which can lead to answers that don't match what the user wants. Improving prompt building methods and adding more context cues to help the model make more accurate readings are ways to deal with this problem [12].

- **Mitigation Plans**

To get around the problems that come with prompts, developers use methods like "prompt engineering" and "iteratively refining instructions." Using clearer and more specific prompts can help reduce ambiguity, and adding context-aware questions makes it easier for the model to come up with answers that make sense [13]. Also, using post-processing methods to clean up and fix model outputs improves the general quality of the answers and lowers the chance of problems happening because of unclear inputs.

It is important for both writers and users to understand how the constantly changing environment of new developments in ChatGPT affects the ongoing problems with working with prompts. Staying up to date on changes makes sure that the model's features are used to their fullest, and good mitigation techniques help deal with the problems that come up with prompt-driven interactions.

## V. Ways that ChatGPT could be made better

### • Better Awareness of Context

ChatGPT is likely to become more aware of its surroundings in future versions. This means improving the model's ability to remember and use context over longer conversations so that answers are more complex and make more sense. Better knowledge of the environment helps the model understand what the user is saying, which leads to more important and relevant interactions.

### • Taking Care of Ethical Concerns

As more AI systems like ChatGPT are used, it's more important than ever to deal with social issues. Moving forward, things might focus on putting in place protections to reduce biases and make sure that answers are fair and responsible. In line with social concerns in AI development, future changes are likely to include ways to handle private information and clear disclosure of content created by AI [14].

### • Changes in Prompting Methods

As prompting methods change, it's likely that more precise changes will be made to the results. In the future, models might have more advanced prompt engineering techniques that let users give more detailed directions. This could mean having more control over the model's imagination, tone, or stylistic features [15].

In the future, asking methods might be combined with other AI models, which would make them more useful overall. AI systems could be completer and more flexible if models that are good at different jobs worked together. This integration might make it easier to switch between jobs without any problems, which would increase the number of applications that can be used and give customers better, more complete options[16-21].

## VI. Conclusions

When we look back at what we learned about ChatGPT and the asking framework, a few main things stand out. Built on the GPT-3.5 design, ChatGPT has a lot of impressive language understanding and context recall skills. Prompts play a big part because they give users clear directions and questions that let them change how the model outputs. Integration of technology, recent progress, and ongoing problems show how flexible working with prompts is. As we

look to the future, possible changes to ChatGPT will focus on making it more aware of its surroundings and handling ethical concerns. At the same time, the development of prompting methods will lead to more precise control over outputs and the ability to connect to other AI models.

As developers and experts continue to investigate what ChatGPT and prompting tools can do, there needs to be a call to action. Improving prompt engineering methods, helping to learn more about how models work, and dealing with problems like uncertainty and bias should be top priorities for group efforts. Engaging with the developer community and experts on a regular basis can also create a space where everyone can learn from each other, which can speed up progress and ensure responsible AI development. To make AI systems that are in line with social standards, we need to be mindful about ethical issues and user privacy.

To conclude, through ChatGPT and the prompting framework shows how these tools have the power to change things. By using their skills, developers and researchers can change the future of AI and natural language processing, bringing in a time of new ideas, responsibility, and openness to everyone.

## References

- [1] Ray, P. P. (2023). ChatGPT: A comprehensive review on background, applications, key challenges, bias, ethics, limitations and future scope. *Internet of Things and Cyber-Physical Systems*.
- [2] Giray, L. (2023). Prompt Engineering with ChatGPT: A Guide for Academic Writers. *Annals of Biomedical Engineering*, 1-5.
- [3] Ozdemir, S. (2023). *Quick Start Guide to Large Language Models: Strategies and Best Practices for Using ChatGPT and Other LLMs*. Addison-Wesley Professional.
- [4] Ye, J., Chen, X., Xu, N., Zu, C., Shao, Z., Liu, S., ... & Huang, X. (2023). A comprehensive capability analysis of gpt-3 and gpt-3.5 series models. *arXiv preprint arXiv:2303.10420*.
- [5] Rezayi, S., Liu, Z., Wu, Z., Dhakal, C., Ge, B., Dai, H., ... & Li, S. (2023). Exploring New Frontiers in Agricultural NLP: Investigating the Potential of Large Language Models for Food Applications. *arXiv preprint arXiv:2306.11892*.
- [6] Liu, N. F., Lin, K., Hewitt, J., Paranjape, A., Bevilacqua, M., Petroni, F., & Liang, P. (2023). Lost in the middle: How language models use long contexts. *arXiv preprint arXiv:2307.03172*.
- [7] Abramski, K., Citraro, S., Lombardi, L., Rossetti, G., & Stella, M. (2023). Cognitive network science reveals bias in GPT-3, GPT-3.5 Turbo, and GPT-4 mirroring math anxiety in high-school students. *Big Data and Cognitive Computing*, 7(3), 124.
- [8] Bin Shiha, R., Atwell, E., & Abbas, N. (2023, November). Detecting Bias in University News Articles: A Comparative Study Using BERT, GPT-3.5 and Google Bard Annotations. In *International Conference on Innovative Techniques and Applications of Artificial Intelligence* (pp. 487-492). Cham: Springer Nature Switzerland.
- [9] Ouyang, L., Wu, J., Jiang, X., Almeida, D., Wainwright, C., Mishkin, P., ... & Lowe, R. (2022). Training language models to follow

- instructions with human feedback. *Advances in Neural Information Processing Systems*, 35, 27730-27744.
- [10] Lee, U., Jung, H., Jeon, Y., Sohn, Y., Hwang, W., Moon, J., & Kim, H. (2023). Few-shot is enough: exploring ChatGPT prompt engineering method for automatic question generation in english education. *Education and Information Technologies*, 1-33.
- [11] Zierock, B., & Jungblut, A. (2023). Leveraging Prompts for Improving AI-Powered Customer Service Platforms: A Case Study of Chat GPT and Midjourney. *Learning*, 116, 63-76.
- [12] Lyu, Q., Tan, J., Zapadka, M. E., Ponnatapura, J., Niu, C., Myers, K. J., ... & Whitlow, C. T. (2023). Translating radiology reports into plain language using ChatGPT and GPT-4 with prompt learning: results, limitations, and potential. *Visual Computing for Industry, Biomedicine, and Art*, 6(1), 9.
- [13] Meyer, J. G., Urbanowicz, R. J., Martin, P. C., O'Connor, K., Li, R., Peng, P. C., ... & Moore, J. H. (2023). ChatGPT and large language models in academia: opportunities and challenges. *BioData Mining*, 16(1), 20.
- [14] Heston, T. F., & Khun, C. (2023). Prompt engineering in medical education. *International Medical Education*, 2(3), 198-205.
- [15] Kocoń, J., Cichecki, I., Kaszyca, O., Kochanek, M., Szydło, D., Baran, J., ... & Kazienko, P. (2023). ChatGPT: Jack of all trades, master of none. *Information Fusion*, 101861.
- [16] Casillo, M., Colace, F., Gupta, B. B., Lorusso, A., Marongiu, F., Santaniello, D., & Valentino, C. (2022, January). A situation awareness approach for smart home management. In *2021 International Seminar on Machine Learning, Optimization, and Data Science (ISMODE)* (pp. 260-265). IEEE.
- [17] Ahmad, I., Qayyum, A., Gupta, B. B., Alassafi, M. O., & AlGhamdi, R. A. (2022). Ensemble of 2D residual neural networks integrated with atrous spatial pyramid pooling module for myocardium segmentation of left ventricle cardiac MRI. *Mathematics*, 10(4), 627.
- [19] Quamara, M., Gupta, B. B., & Yamaguchi, S. (2021, January). An end-to-end security framework for smart healthcare information sharing against botnet-based cyber-attacks. In *2021 IEEE International Conference on Consumer Electronics (ICCE)* (pp. 1-4). IEEE.
- [20] Gupta, B. B., & Quamara, M. (2018). A dynamic security policies generation model for access control in smart card based applications. In *Cyberspace Safety and Security: 10th International Symposium, CSS 2018, Amalfi, Italy, October 29–31, 2018, Proceedings 10* (pp. 132-143). Springer International Publishing.
- [21] Akhtar, T., & Gupta, B. B. (2021). Analysing smart power grid against different cyber attacks on SCADA system. *International Journal of Innovative Computing and Applications*, 12(4), 195-205.