

Ethical AI Use: Prompt Engineering

Strategy for Optimal Generative NLP Use

ME 401



Ethical AI Use:

Ethical AI Use, for the purposes of this class, is defined through the lens of efficiency.

There is a real cost to LLM use, and so we will seek to get the most value from our prescribed interactions with these models as possible.



Prompt Templates:

We will be using a LaTeX template to guide and record our AI use.

These templates will be used to explore engineering education use cases for LLMs.



Prompt Templates:

Who uses LaTeX?

LaTeX is extensively used by researchers, scientists, engineers, and academics, especially within disciplines that require precise formatting of mathematical formulas and references. Large academic institutions, publishers, and companies handling technical writing or documentation leverage LaTeX for its precision and reliability. Within organizations, roles such as technical writers, researchers, and academic authors frequently use LaTeX to prepare their publications.

<https://pangea.app/glossary/latex>



Prompt Templates:

LaTeX syntax can be a little overwhelming initially.

We will overcome this barrier by providing a seamless means of creating professional documents.



```

13 % Section formatting
14 \titleformat{\section}{\normalfont\bfseries\uppercase}{\thesection.}{1em}{}
15 \titleformat{\subsection}[runin]{\bfseries}{\thesubsection}{0.5em}{}[.]
16
17 % Header
18 \begin{document}
19 \thispagestyle{plain}
20
21 \begin{center}
22   \Large \textbf{ME 401 \&\& Systems and Applications} \&\&
23   \normalsize
24   \textit{Semester:} Fall 2025 \&\&
25
26 % ===== DON'T FORGET TO ADD THE MODEL BEING USED =====
27
28   \textit{LLM:} ChatGPT \&\&
29
30 \end{center}

```



ME 401
Systems and Applications
Semester: Fall 2025
LLM: ChatGPT

The benefit of this system is that each prompt report will be identically documented and students will only need to add text to specified sections.



Prompt Report Example

The first two sections are 'Primary Question' and 'Initial Thoughts'. These are for the student to explain their reason for using the LLM and how that question fits into the larger topic they are exploring.



ME 401

Systems and Applications

Semester: Fall 2025

LLM: ChatGPT

PRIMARY QUESTION

The concept of "ethical AI" is difficult to define because AI is a complex and diverse topic with technological, social, environmental, and political implications. I want to understand the viewpoints of the academic and industrial parties most involved in its philosophical development. What are the methodologies and tensions dominating the conversation?

INITIAL THOUGHTS

This is a first pass at creating a coherent structure for a larger exploration of 'ethical AI', specifically in engineering education. The goal is to expose a variety of new directions of inquiry, as well as to identify key names to look into while researching this field.



Prompt Report Example

Students will then craft an input for the model using the template and best practices for effective prompt engineering.



PROMPT

Instruction: We are exploring the concept of ethical AI use in engineering education. Help me understand the ethical ramifications of LLM use through the lens of engineering efficiency, critical thinking development, energy cost, and other pertinent topics.

Output: All major ideas should be linked to a person or company who can be used to research the concept further / validate assertions.

concise answer, format to insert into a LaTeX subsection, cleanest syntax



Prompt Report Example

The student will record how many inferences were required to arrive at a satisfactory answer, write a short evaluation of the result, and explain how they hope to use it in their research.



RESULTS

1 inference.

This response is a good place to start exploring from. I can now look up some of these figures and try to get a sense of the global conversation around ethical AI use.



Prompt Report Example

The last section is reserved for copying the notable portions of the model's output.

Those parts found especially helpful or unhelpful.



OUTPUT

Helpful.

0.1 Ethical Ramifications of LLM Use in Engineering Education. The integration of large language models (LLMs) in engineering education raises several ethical considerations that balance efficiency, human development, and environmental sustainability.

Engineering Efficiency. LLMs can accelerate design iteration and code generation, supporting engineering workflows. Microsoft Research (Shum et al.) highlights their capacity to augment productivity while cautioning against over-reliance that diminishes verification skills.

Critical Thinking Development. Joseph Weizenbaum (MIT) warned that automation risks displacing reflective judgment. In education, overuse of generative AI may erode problem-solving



habits. N. Katherine Hayles (Duke University) emphasizes maintaining interpretive engagement rather than outsourcing reasoning.

Energy and Environmental Costs. Training and inference of LLMs demand high energy inputs. Emma Strubell (Carnegie Mellon University) quantified the carbon footprint of model training, urging transparency and efficiency improvements. Google DeepMind has also reported efforts in model compression and low-energy inference.

Equity and Access. Timnit Gebru (DAIR Institute) argues that unequal access to computational resources entrenches disparities in global education. UNESCO advocates for localized, culturally sensitive AI tools to avoid reinforcing epistemic dominance.

Intellectual Integrity. Shoshana Zuboff (Harvard) critiques the commodification of knowledge in digital systems, noting risks of surveillance and data extraction in AI-enhanced learning environments. This calls for institutional safeguards to protect student data.

Professional Responsibility. IEEE's "Ethically Aligned Design" framework underscores the duty of engineers to ensure that AI tools support—not undermine—the development of technical judgment and societal responsibility.

In summary, LLM use in engineering education offers significant efficiency gains but must be critically balanced against risks to student cognition, environmental cost, and global equity.

Unhelpful. This response is good overall.

This memo is designed for use by the Wada Research Group to develop ethical and efficient engineering education strategies and technologies.



Prompt Engineering tips:

Format in discrete sections:

- Instruction – a specific task that guides the model's behavior (e.g., "Proofread the text");
- Context – external information or additional context that provides background knowledge to the model, helping it generate relevant responses (e.g., "The text is an email that needs to follow an official corporate style");
- Input data – the content of the prompt that the model needs to solve, might vary given the instruction (e.g., contents of different emails);
- Output indicator – specifies the type or format of the desired output (e.g., "Do not rewrite the text, only correct grammar, spelling, and punctuation").

Prompt Engineering tips:

#Principle	Prompt Principle for Instructions
1	If you prefer more concise answers, no need to be polite with LLM so there is no need to add phrases like “please”, “if you don’t mind”, “thank you”, “I would like to”, etc., and get straight to the point.
2	Integrate the intended audience in the prompt, e.g., the audience is an expert in the field.
3	Break down complex tasks into a sequence of simpler prompts in an interactive conversation.
4	Employ affirmative directives such as ‘ <i>do</i> ,’ while steering clear of negative language like ‘ <i>don’t</i> ’.
5	<p>When you need clarity or a deeper understanding of a topic, idea, or any piece of information, utilize the following prompts:</p> <ul style="list-style-type: none">o Explain [insert specific topic] in simple terms.o Explain to me like I’m 11 years old.o Explain to me as if I’m a beginner in [field].o Write the [essay/text/paragraph] using simple English like you’re explaining something to a 5-year-old.
6	Add “I’m going to tip \$xxx for a better solution!”
7	Implement example-driven prompting (Use few-shot prompting).



Prompt Engineering tips:

8	When formatting your prompt, start with '###Instruction###', followed by either '###Example###' or '###Question###' if relevant. Subsequently, present your content. Use one or more line breaks to separate instructions, examples, questions, context, and input data.
9	Incorporate the following phrases: "Your task is" and "You MUST".
10	Incorporate the following phrases: "You will be penalized".
11	Use the phrase "Answer a question given in a natural, human-like manner" in your prompts.
12	Use leading words like writing "think step by step".
13	Add to your prompt the following phrase "Ensure that your answer is unbiased and avoids relying on stereotypes."
14	Allow the model to elicit precise details and requirements from you by asking you questions until he has enough information to provide the needed output (for example, "From now on, I would like you to ask me questions to ...").
15	To inquire about a specific topic or idea or any information and you want to test your understanding, you can use the following phrase: "Teach me any [theorem/topic/rule name] and include a test at the end, and let me know if my answers are correct after I respond, without providing the answers beforehand."
16	Assign a role to the large language models.
17	Use Delimiters.
18	Repeat a specific word or phrase multiple times within a prompt.
19	Combine Chain-of-thought (CoT) with few-Shot prompts.
20	Use output primers, which involve concluding your prompt with the beginning of the desired output. Utilize output primers by ending your prompt with the start of the anticipated response.



Prompt Engineering tips:

21	To write an essay /text /paragraph /article or any type of text that should be detailed: “Write a detailed [essay/text /paragraph] for me on [topic] in detail by adding all the information necessary”.
22	To correct/change specific text without changing its style: “Try to revise every paragraph sent by users. You should only improve the user’s grammar and vocabulary and make sure it sounds natural. You should maintain the original writing style, ensuring that a formal paragraph remains formal.”
23	When you have a complex coding prompt that may be in different files: “From now and on whenever you generate code that spans more than one file, generate a [programming language] script that can be run to automatically create the specified files or make changes to existing files to insert the generated code. [your question]”.
24	When you want to initiate or continue a text using specific words, phrases, or sentences, utilize the following prompt: o I’m providing you with the beginning [song lyrics/story/paragraph/essay...]: [Insert lyrics/words/sentence]. Finish it based on the words provided. Keep the flow consistent.
25	Clearly state the requirements that the model must follow in order to produce content, in the form of the keywords, regulations, hint, or instructions
26	To write any text, such as an essay or paragraph, that is intended to be similar to a provided sample, include the following instructions: o Use the same language based on the provided paragraph[/title/text /essay/answer].

Table 1: Overview of 26 randomly ordered prompt principles.

S. M. Bsharat, A. Myrzakhan, and Z. Shen, "Principled Instructions Are All You Need for Questioning LLaMA-1/2, GPT-3.5/4," arXiv preprint arXiv:2312.16171, 2023.

