

Prompt Engineering

The AI Revolution

AI PE Course (2024-2025)

Week5: **Exploring Prompt Patterns & Persona Techniques**

Google Classroom:
[d5hsxq3](#)

3d Grade IT Students

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Understanding Prompt Patterns

- **Definition:** Prompt patterns are pre-structured, reusable templates or formats for prompts, designed to achieve consistent and specific outputs.
- **Purpose:** Use patterns to solve problems or get specific outputs (e.g., code, summaries, ideas).
- **Example:**
 - **Prompt:** "Explain bubble sort in simple terms."
 - **AI Output:** "Bubble sort repeatedly compares adjacent items in a list and swaps them if needed."
- **Applications:** Writing code, answering technical questions, generating ideas.
- **Key Takeaway:** Knowing how to structure prompts ensures more predictable and useful AI interactions.

Prompt Patterns

These are three common categories of prompt patterns:

- 1. Persona-Based Pattern:** "Act as a cybersecurity analyst analyzing logs."
- 2. Step-by-Step Pattern:** "Explain how ransomware works in three steps."
- 3. Contextual Pattern:** "Given the rise of ransomware, suggest countermeasures."

Using these patterns can enhance the interaction with an LLM by providing clearer, more structured input, which often leads to more relevant and useful outputs. They can be particularly helpful in educational, creative, or professional settings where specific types of responses are desired from the AI model.

Prompt Patterns

| Pattern | Structure | Example |
|---------------|--|--|
| Persona-Based | "Act as X. Perform Y." | "Act as a server admin. Analyze this log." |
| Contextual | "Given [context], explain or solve [problem]." | "Given this error, suggest troubleshooting steps." |
| Step-by-Step | "Explain [topic] in detailed steps." | "Explain DDoS prevention in 3 steps." |

The Power of the Persona

What Are Persona Patterns?

- Structured prompts that make AI respond as if it's a specific person or expert or role.

Why Use Them?

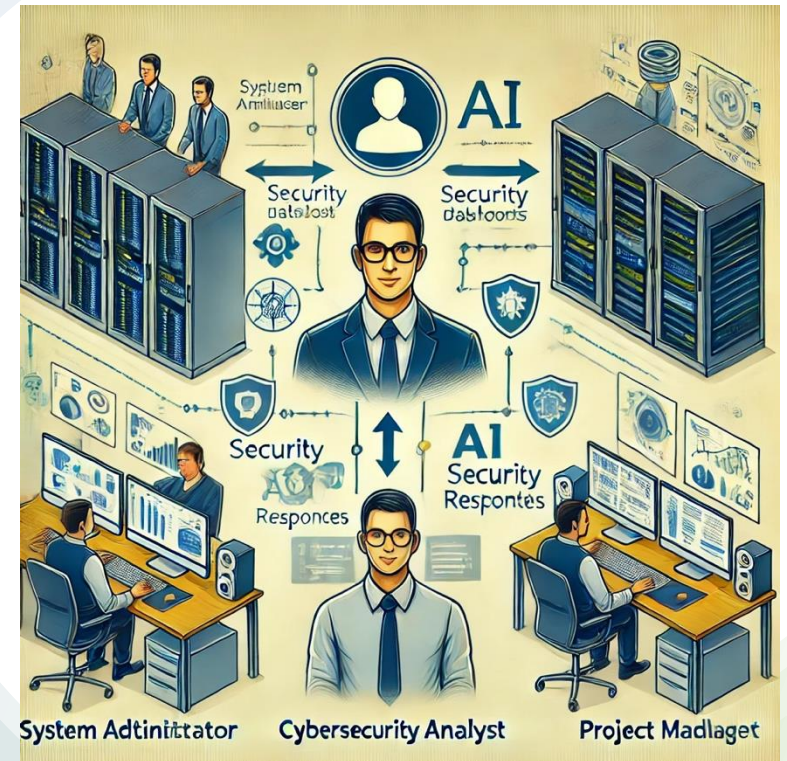
- Simplifies complex tasks.
- Generates responses tailored to a specific perspective.
- Efficient for problem-solving and decision-making.

IT-Specific Applications:

1. **System Administrator:** "Act as a system administrator. Analyze this server log for potential issues."
2. **Cybersecurity Analyst:** "Pretend you are a cybersecurity expert. Suggest solutions to prevent phishing attacks."
3. **IT Project Manager:** "Assume you are a project manager. Explain how Agile benefits software development."

Key Takeaway:

- Persona prompts enhance the AI's ability to provide expert-level insights and guidance.



Example: "Reading and Utilizing the "Helpful Assistant" Prompt Pattern

Overview:

- Use the "Helpful Assistant" pattern to guide AI in providing respectful, accurate, and helpful responses.

IT-Specific Examples:

1. Programming Debugger:

- Prompt: "You are a helpful programming assistant. Debug the following Python code for errors."

2. Server Troubleshooting:

- Prompt: "You are a skilled system administrator. Provide step-by-step guidance to troubleshoot a downed server."

3. Learning Guide:

- Prompt: "You are a knowledgeable instructor. Explain recursion in simple terms for beginners."

Steps to Use the Pattern:

1. **Define Purpose:** What task should the assistant perform?
2. **Set Context:** Provide a background to guide responses.
3. **Test Output:** Ensure responses align with the desired tone and task.

Key Takeaway:

- The "Helpful Assistant" pattern ensures AI remains supportive, professional, and constructive.





Format of the Persona Pattern

Steps to Create a Persona Pattern:

- 1. Define a Persona:** Choose a role (e.g., IT professional, System Admin, and even a System or any other thing).
- 2. Assign a Task:** Provide a clear and specific objective (e.g., troubleshoot errors, analyze logs).
- 3. Combine:** Structure the prompt:
 - Example: "Act as a network engineer. Recommend steps to improve a slow LAN connection."

IT-Focused Examples:

1. "Act as a system administrator. Analyze the following log file for unusual behavior."
2. "Act as a project manager. Create a weekly sprint plan for a software team."
3. "Act as a Linux server. Respond to commands I type as if you are a terminal."

Key Tip: Be specific about the persona and the task for more accurate AI responses.

Examples of the Persona Pattern

More IT-Focused Examples 😊

1. System Administrator:

1. **Prompt:** Act as a system administrator. Analyze the following server log for unusual behavior.
2. **Task:** Identify errors and recommend solutions.

2. Network Engineer:

1. **Prompt:** Act as a network engineer. Suggest ways to optimize a slow network.
2. **Task:** Provide a step-by-step guide to troubleshoot and enhance performance.

3. IT Help Desk Assistant:

1. **Prompt:** Act as an IT help desk assistant. Solve a Wi-Fi connectivity issue.
2. **Task:** Provide practical, easy-to-follow advice.

4. Cybersecurity Analyst:

1. **Prompt:** Pretend you are a cybersecurity analyst. Recommend ways to prevent phishing attacks.
2. **Task:** List common phishing tactics and how to mitigate them.

5. Linux Terminal:

1. **Prompt:** Act as a Linux server. Respond as if you are a terminal when I type commands.
2. **Task:** Simulate responses for basic commands like ls or cd.

Key Takeaway

- Persona-based prompts help tailor AI responses to specific roles, making them highly relevant for IT applications.





Lab task (Compile and Submit as PDF)

- **Tasks:**

1. **Persona Pattern for IT Professional:**

- Write a prompt for an IT persona (e.g., system administrator or network engineer).
- Test it and document the AI's response.

2. **Persona Pattern for Technology:**

- Create a prompt for a technical system (e.g., a Linux terminal or database).
- Test how the AI emulates the persona.

3. **Creative Persona Prompt:**

- Write a prompt for a fictional or non-IT persona (e.g., an OS system, animal or object) and evaluate its response.

- **Deliverables:**

- Submit a PDF with:
 - The prompt.
 - The AI's response.
 - A reflection on the results and possible improvements.

- **Optional Advanced Task:**

- Test multiple prompts with slight variations. Compare and analyze their outputs.

Paper Summary

A Prompt Pattern Catalog to Enhance Prompt Engineering with ChatGPT

Jules White, Quchen Fu, Sam Hays, Michael Sandborn, Carlos Olea, Henry Gilbert, Ashraf Elnashar, Jesse Spencer-Smith, and Douglas C. Schmidt

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Overview:

- Title: Foundations of Prompt Engineering
- Link: <https://arxiv.org/pdf/2302.11382.pdf>
- Summary:
 - Discusses techniques to design effective prompts.
 - Highlights the role of prompt engineering in AI performance optimization.
 - Provides examples of how prompt patterns improve model accuracy.

Key points:

1. Structured prompts yield more reliable and context-aware outputs.
2. Refinement and iteration are critical for achieving desired results.

Optional Task:

- Read the paper's introduction.
- Reflect: How can prompt engineering apply to solving IT problems?

Paper download link: <https://arxiv.org/pdf/2302.11382.pdf>



Paper's key insights

The paper "**A Prompt Pattern Catalog to Enhance Prompt Engineering with ChatGPT**" offers valuable insights into the systematic design of prompts for large language models (LLMs). Key takeaways include:

- 1. Prompt Engineering as Programming:** Prompts act as instructions to LLMs, enforcing rules, automating processes, and ensuring specific qualities in generated outputs. This positions prompt engineering as a form of programming that customizes LLM interactions.
- 2. Introduction of Prompt Patterns:** The paper introduces a catalog of prompt patterns – reusable solutions to common problems in LLM interactions. These patterns document successful approaches for systematically engineering different input, output, and interaction behaviors with conversational LLMs.
- 3. Enhancing AI Capabilities:** By applying these prompt patterns, users can guide LLMs to produce more structured and nuanced outputs, aiding a variety of tasks, including software engineering.
- 4. Knowledge Transfer Method:** Prompt patterns serve as a knowledge transfer method, analogous to software patterns, providing reusable solutions to common problems in LLM interactions.

These insights underscore the importance of prompt engineering in effectively utilizing LLMs like ChatGPT, highlighting the role of structured prompt patterns in enhancing AI interactions.

Optional :Advanced Exercises for Prompt Engineering

1. Compare Multiple Personas:

1. Task: Write three different prompts using the same task but with different personas (e.g., System Administrator, IT Help Desk Assistant, and Network Engineer).
2. Analyze how each persona influences the AI's tone and response.

2. Iterative Prompt Refinement:

1. Task: Start with a simple prompt (e.g., "Optimize network performance").
2. Refine it in at least three iterations to achieve a more specific and accurate response.
3. Document the differences in outputs.

3. Multi-Step Prompts:

1. Task: Create a prompt that requires the AI to follow a sequence of steps (e.g., diagnosing a system issue, providing a solution, and explaining it in simple terms).
2. Test and evaluate the coherence of the response.

4. Chain-of-Thought Prompting:

1. Task: Use a chain-of-thought approach to guide the AI through complex problem-solving.
2. Example: "Explain step by step how to secure a cloud-based application against cyber threats."

5. Combining Patterns:

1. Task: Combine two or more prompt patterns (e.g., Contextual and Persona-Based) to tackle a complex scenario.
2. Example: "Given the rise of DDoS attacks, act as a cybersecurity analyst and provide a prevention plan."

6. Creative IT Use Cases:

1. Task: Use a Creative Prompt to design a futuristic IT solution.
2. Example: "Imagine an AI-driven network that repairs itself in real-time. Describe how it works."

7. Prompt Debugging:

1. Task: Write a flawed prompt and test it. Identify why the response is unsatisfactory and rewrite the prompt for better results.

8. Cross-Domain Persona:

1. Task: Write a prompt for an AI to act as a hybrid persona (e.g., a cybersecurity expert who also understands project management).
2. Example: "Act as a cybersecurity analyst and explain how project planning impacts vulnerability mitigation."

Staying Connected & Learning More(home optional tasks)

These are some recommended prompt engineering online courses for you:

| Course Name | Provider | Key Learning Outcome |
|---|-----------------------|---|
| Prompt Engineering for ChatGPT | Vanderbilt University | Use ChatGPT for content creation and problem-solving. |
| ChatGPT Prompt Engineering for Developers | DeepLearning.AI | Write prompts to automate coding and debugging tasks. |
| Generative AI: Prompt Engineering Basics | IBM | Understand AI models for creative and technical tasks. |
| AI Foundations: Prompt Engineering with ChatGPT | Arizona State Univ. | Apply AI to real-world IT problems using effective prompts. |

Optional Task:

- Choose one course or resource.
- Explore its content and document one key insight or skill learned.

ChatGPT Prompt Engineering for Developers

A new course from

OpenAI DeepLearning.AI



Prompt Engineering Courses

References

1. Brown, T., et al. (2020). "Language Models are Few-Shot Learners." [Read the Paper](#)
2. Prompt Engineering for ChatGPT, Vanderbilt University. [Course Link](#)
3. Generative AI with Large Language Models, DeepLearning.AI. [Course Link](#)

Useful Tools:

- OpenAI GPT Playground: [Explore Here](#)
- DeepLearning.AI Resources: [Visit Here](#)

Interactive Task:

- Scan the QR code to explore the "Prompt Engineering for Developers" course.

QR Code: ChatGPT Prompt Engineering for Developers Course

