**Prompt Engineering Techniques & Tips for Students**

A core part of this project is leveraging AI tools effectively – particularly crafting prompts for DALL·E 3 to generate illustrations and using prompts for text simplification with language models. This section provides guidance on **prompt engineering**, tailored for CS students who can appreciate systematic approaches. By iteratively refining prompts, structuring complex tasks into simpler queries, and applying techniques like chained and few-shot prompting, the teams can achieve more accurate and creative results from AI. We also address common issues such as anachronisms or style consistency, and how to debug them.

**Iterative Prompt Development**

Prompt engineering is an **iterative process** – rarely will the first prompt yield a perfect image or summary. Students should approach it like debugging code: inspect the output and refine the “instructions” until it meets requirements ([How to Use DALL-E 3: Tips, Examples, and Features | DataCamp](https://www.datacamp.com/tutorial/an-introduction-to-dalle3#:~:text=,try%20again%20and%20refine%20it)). Some tips:

* **Start simple, then add detail:** For instance, begin with “A king on an elephant in a battle illustration” to see general output. Then incrementally add constraints: “...in 16th-century Indian armour, cartoon style, no gore.” Breaking down the addition of details helps identify which part of a prompt causes unwanted effects.
* **Adjust one factor at a time:** If an image came out too dark, next prompt add “bright daylight”. If still dark, maybe the scenario is inherently dark, so instead try removing words like “dramatic” or add “happy”. This systematic tweaking teaches which words influence which aspect.
* **Use adjectives and style cues:** Adjectives are your friends in prompts. Words like *bright, playful, detailed, gentle, somber, colourful, sketch, watercolour, cartoonish* set the mood and style. For example, saying “a **playful, cartoonish** drawing of an elephant” vs “a **detailed realistic** painting of an elephant” yields very different results ([My prompting evolution with DALL-E – How I get the best results - Oollecode](https://oollecode.com/my-prompting-evolution-with-dall-e-how-i-get-the-best-results/#:~:text=My%20breakthrough%20with%20DALL,add%20depth%20to%20my%20prompts)). We leveraged this by consistently using descriptors aligning with “children’s illustration” to keep things kid friendly.
* **Check the output and iterate:** After each generation, do a quick critique: Did the image follow the theme? Any anachronisms (out-of-time elements)? Are faces and expressions, okay? Then modify the prompt. It’s normal to have multiple tries – document each change and outcome to learn. *“Your initial prompt may not produce what you desire… you can continue to try again and refine it,”* as a prompt guide suggests ([How to Use DALL-E 3: Tips, Examples, and Features | DataCamp](https://www.datacamp.com/tutorial/an-introduction-to-dalle3#:~:text=,try%20again%20and%20refine%20it)).

Concrete Example (from our project):

First prompt: “King leading a battle” – output: King looked angry, and scene was very violent. Refined prompt: “King leading his army, **friendly face**, no blood, in children’s book style” – output: King looks better, but modern-looking weapons appeared. Refined again: “... with **swords and spears** (no guns),” – output: Now it matches the historical weapons. This iterative cycle might repeat until the image is acceptable. Each change targets a specific issue (face expression, or anachronistic guns). Through iteration, the students “converse” with the AI to steer it.

**Chained Prompting**

**Chained prompting** means breaking a complex request into a sequence of simpler prompts whose results feed into the next ([Mastering LLMs: A Comprehensive Guide to Prompting Techniques](https://www.analyticsvidhya.com/blog/2023/06/mastering-llms-a-comprehensive-guide-to-efficient-prompting-techniques/#:~:text=Sometimes%2C%20solving%20a%20big%20problem,problem%20into%20smaller%20steps%20and)). This is useful if DALL·E or ChatGPT struggles with a multi-part task in one go. For instance:

* To generate a scene with multiple elements (like our Scene 3 with market + temple + elephant), the team could first prompt for a simpler base image (e.g., just the marketplace), then separately prompt for an elephant image, and finally combine them (either by using an image editing tool or by describing both in a final prompt after seeing what each looks like). Essentially, *step-by-step prompting helps manage complexity*. While DALL·E doesn’t allow directly inputting one image into another prompt (unless using image prompts which may not be available), the students can use the outputs and re-describe them. Another approach: use ChatGPT to generate a detailed scene description from a simple prompt, then feed that description back into DALL·E. This two-step chain leverages ChatGPT’s strength in elaboration and DALL·E’s strength in visualization.
* Chained prompting is also useful for the **writing side**: Instead of asking ChatGPT *“Summarize the book for a 7-year-old”* in one shot (which might be too broad), chain the task:
  1. Prompt 1: “List the 5 most important events in the Vijayanagara Empire story.” (ChatGPT gives key events.)
  2. Prompt 2: “For each of these events, write 2-3 simple sentences suitable for a child, in story tone.” (Now you get child-friendly snippets for each.)
  3. Prompt 3: “Combine these into a short story with a clear beginning and end, ensuring it flows naturally for a child reader.” This way, the model is guided through the reasoning process. It’s like decomposing a program into functions. As noted in a prompt engineering guide, *“solving a big problem in one go can overwhelm the LLM. Breaking down the problem into smaller steps ensures the output is coherent and logical” (*[*Mastering LLMs: A Comprehensive Guide to Prompting Techniques*](https://www.analyticsvidhya.com/blog/2023/06/mastering-llms-a-comprehensive-guide-to-efficient-prompting-techniques/#:~:text=Sometimes%2C%20solving%20a%20big%20problem,problem%20into%20smaller%20steps%20and)*)*. We applied this by first outlining scenes, then tackling them one by one.

**Few-Shot Prompting**

**Few-shot prompting** involves giving the AI examples within the prompt so it understands the desired output format or style ([Mastering LLMs: A Comprehensive Guide to Prompting Techniques](https://www.analyticsvidhya.com/blog/2023/06/mastering-llms-a-comprehensive-guide-to-efficient-prompting-techniques/#:~:text=Few,prompt%20may%20look%20like%20%E2%80%93)). In our context:

* For **ChatGPT text rewriting**, we can show an example of simplified text, so it learns the style. E.g., *“Original: Vijayanagar’s armies suffered a colossal defeat. Simplified: The empire’s army lost a big battle.”* Then ask it to do similar for another sentence. By providing 1-2 examples (few-shot), the model can mimic that style. This technique was useful when converting complex sentences or old-fashioned language from Robert Sewell’s book into modern simple English. It’s like giving the model a mini training set inside the prompt ([Mastering LLMs: A Comprehensive Guide to Prompting Techniques](https://www.analyticsvidhya.com/blog/2023/06/mastering-llms-a-comprehensive-guide-to-efficient-prompting-techniques/#:~:text=%E2%80%9CExample%3A%201,%2F%20Negative)).
* For **DALL·E prompts**, we cannot exactly give image examples (unless an interface allows uploading example images), but we can mimic few-shot by consistently using certain phrases (effectively “teaching” the style). Also, if using the ChatGPT+DALL·E integration, one could describe a previous image in the conversation: “The last image had a nice style with soft colours – generate the next image in a similar style.” This relies on the conversation memory (few-shot learning across prompts in the same chat). We should caution the students: not sure how persistent DALL·E is with conversation memory, but the ChatGPT wrapper might carry some context. Testing this could be interesting.
* Another type of few-shot for images: refer to known artistic styles or references that DALL·E would know. For instance, “in the style of **Amar Chitra Katha** illustrations” (a famous Indian children’s comic style) – if DALL·E knows it, that’s like giving it an example style to follow. Or referencing “Disney style” or “Studio Ghibli style” etc., though one must be mindful of not infringing on specific copyrighted styles; better to use broad or public styles. We largely stuck to generic “children’s book” style, which is understood widely.

**Keyword Modulation and Style Consistency**

**Keyword modulation** means tuning the presence or weight of certain keywords in prompts to influence the output. While some advanced prompting allows weighting tokens, DALL·E 3 doesn’t have an explicit syntax for weight that we know of. Instead, students can do this qualitatively:

* Use stronger or more specific words for elements you want to emphasize and omit or use softer language for things to de-emphasize. For example, compare:
  + Prompt A: “a **grand** palace with **intricate** details, a **tiny** figure of a king” – here “grand” and “intricate” likely yield a very detailed palace, while “tiny” might make the king small in composition.
  + Prompt B: “a palace and a king” – yields a more balanced scene. If we found the palace overshadowing the king too much in output, we might remove some emphasis from palace and add adjectives to king (“a palace in background, and **the king prominently in front, regal**”). We are modulating focus using words.
* Another trick: sometimes including a detail will trigger an unwanted style. E.g., mentioning “photograph” vs “painting” is a huge switch. In our case, we consistently avoided words that would trigger realism (like “photo” or “render”) and used “illustration” to stick to a drawn style. If any prompt accidentally got too realistic (maybe by using word like “detailed” too much), we modulated back by adding “cartoon”.
* Students should also be aware of **stop words** or phrasing to avoid. For child-friendly outputs, avoid words that might cue the model into adult or horror content. For instance, instead of “blood” say “injury” or better, avoid altogether and say “defeated” as we did. The OpenAI community tips mention adjusting complexity and style for age appropriateness ([Dalle 3: Looking for tips to optimize AI prompts for age-appropriate ...](https://community.openai.com/t/dalle-3-looking-for-tips-to-optimize-ai-prompts-for-age-appropriate-coloring-pages/1043742" \l ":~:text=,simple%20style%20suitable%20for%20coloring)) – we essentially did this by moderating keywords (no “gore”, using “happy, playful” frequently).
* **Maintaining Style:** To ensure all prompts result in a coherent style, keep using the same key phrases each time. We decided on *“cartoon-style illustration, children’s storybook style, bright colours”* early, and that (or a variant) is in **every prompt**. Consistency in wording modulates the output to stay consistent visually. If the team notices a prompt that must differ (like the battle scene needed “darker” tone), they should still try to include the base style phrase (maybe “children’s book style but with a darker palette for drama”) so it doesn’t produce a wholly different art style. Additionally, using similar structure in sentences can influence the AI to stick to what it did before. This is somewhat like few-shot across prompts – if each prompt starts with “Illustration of ...” the AI might implicitly follow that format and style.

**Debugging Prompt Issues**

Common problems and how to address them:

* **Anachronisms:** The model might introduce elements that don’t belong in the historical period (e.g., wristwatches, modern clothes, vehicles). We encountered this risk whenever prompts were not explicit enough about setting. The solution: explicitly anchor the prompt in the time (“medieval”, “16th-century”, “ancient”) and mention what should or should *not* be there. If a telephone pole shows up, next prompt might add “(no electrical poles, no modern technology)”. The team should scrutinize each output for these and edit prompts accordingly. It’s a bit trial and error – sometimes DALL·E just uses whatever it knows; for example, if you say “market”, it might think of a modern farmers market unless you say, “ancient market”. Thus, we learned to prepend era context for every scene. Over time, the students get a feel for words that trigger modern stuff and avoid them.
* **Overcrowded or confused images:** DALL·E sometimes jumbles too many elements (particularly if the prompt is long). If an image is too messy or not focusing, **simplify the prompt**. Emphasize the primary subject early in the prompt (models give weight to early tokens often). For example, instead of “Illustration of a city with a king, elephants, market, festival...” break into, “Illustration of a festival in an ancient city. In the foreground, an elephant... etc.” i.e., structure the scene description in sentences or clear clauses. Clarity in the prompt leads to clarity in the image.
* **Facial expressions or aesthetics not right:** If a character looks angry or scary unintentionally, add adjectives like “kind, gentle, smiling”. We did this for the king images. Conversely, if something should look fierce but doesn’t, use words like “determined face” or “fierce stance” – though we avoided too much fierceness given our audience. The key is describing emotion and expression in the prompt to guide the AI’s portrayal of people.
* **Content filter issues:** Occasionally, if a prompt is interpreted as disallowed (like something about violence or fire might trigger filters), the team should rephrase to be milder. For example, user might avoid “blood” or “kill”. In our prompts, we used neutral words (“defeated” instead of “killed”) and it should be fine. If any prompt trips a filter, analyse which word might be the cause and find a synonym or drop it.
* **Model limitations:** The students should understand DALL·E’s limits. For instance, generating text in images (like a sign) often fails or looks weird – we won’t rely on the AI for actual text in illustrations, we’d add those via Canva if needed (like labelling “Hampi” on a map ourselves). Also, fine details like faces of small background figures might be distorted – that’s acceptable as long as the overall image is clear. Don’t waste too many iterations trying to perfect tiny details that the model struggles with; instead, adjust the composition to avoid showing them. For example, rather than showing dozens of small human figures (which DALL·E might render blobby), focus on fewer, larger figures in the prompt.
* **Consistency issues:** As mentioned, a character (like the king) may not look the same across images. To mitigate, keep describing him similarly (same clothes, etc.). If absolute consistency is needed, a workaround could be to use one image as a base and ask DALL·E to make variations (if using Bing or OpenAI, the “variation” feature might create similar looking outputs). The team can try the variation feature on a successful image to get a slightly different pose of the same character. If one image of Krishna Deva Raya was perfect, use “variations” to generate him in another scene with similar appearance. This is easier than fresh prompts. Alternatively, import the image into an editor and use generative fill (if any tool available) to change background, etc., keeping the character. These are advanced moves – at minimum, consistency in prompt language is attempted.
* **Collaboration on prompts:** Since multiple students might be writing prompts, use the version control to track changes. They can each work on different scenes’ prompts (modular) but it’s good to peer review each other’s prompts for consistency. One can spot if another’s prompt forgot the “children’s book style” phrase, for example, and correct it. Having a shared **prompt guide checklist** (like: does it include style? era? desired mood? avoid banned words?) is helpful before sending a prompt to generation.

**Tools & Techniques in Prompting**

* **Use ChatGPT for prompt help:** Ironically, you can ask ChatGPT itself for suggestions if stuck. For instance, *“Suggest a prompt to generate an image of a medieval Indian market suitable for kids.”* It often gives decent starting points. Just be mindful to tweak them to your needs.
* **Leverage community tips:** The OpenAI community forum and other creators often share prompt insights (like the threads we saw about age-appropriate prompts ([Dalle 3: Looking for tips to optimize AI prompts for age-appropriate ...](https://community.openai.com/t/dalle-3-looking-for-tips-to-optimize-ai-prompts-for-age-appropriate-coloring-pages/1043742" \l ":~:text=,simple%20style%20suitable%20for%20coloring))). A quick search can yield ideas if something isn’t working. The students have internet, so they can quickly research if, say, DALL·E has trouble with Indian attire – maybe someone found that using the word “Mughal painting style” yields an older Indian look, etc.
* **Experimentation:** Encourage an experimental mindset. Prompt engineering is as much an art as science. Trying wildcards (like including an artist name, or a metaphor) can sometimes produce surprisingly good art. E.g., “in the style of an ancient Indian mural” might give a fresco-like image that could be cool for one scene (maybe the festival). As long as it stays child-friendly, such experiments are welcome. Just evaluate if it still fits the book’s overall look.

In summary, prompt engineering in this project is about **translating historical and artistic intent into AI-friendly language**. The students, being CS engineers, can systematically approach it: treat each prompt as a function call where the output needs verification and possibly additional parameters. They will practice debugging by analysing outputs critically. By the end, they’ll likely internalize a lot of these tips: *specificity, iterative refinement, chaining, examples,* etc., which are widely applicable to any AI-human interaction problem. And they will see how a well-crafted prompt can turn a simple idea (“a busy market”) into a vivid image that matches their story needs.

**DALL.E 3 Prompt Engineering Course**<https://www.youtube.com/watch?v=muwMWYNPIZ4>