Prompt Engineering for generating Review articles for GSICS Newsletter

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Introduction and Goal

- Generative Artificial Intelligence (GenAI) is has emerged as a powerful tool to generate personalized text, code, images and videos using Large Language Models.
- One of the methods to achieve personalization is inputting high quality language prompts to the Large Language model.
- The goal of this internship was to develop an interface to the LLAMA3 large language model and determine its feasibility in generating review articles for the GSICS Newsletter.

Method

- Developed a web interface for that would take language based prompts as input and display the output generated by LLAMA3 when this prompt is input into the LLAMA 3.
- Access the LLAMA 3 (70b) via the Groq API
- Input prompts and (research article) text on the web interface
- Gather the review article summary at the web interface

Why Groq and Gradio

- Large Language Models such as LLAMA 3 with 70 billion parameters is more than 3 Gb in size. When downloaded and used in a CPU/GPU environment takes long time to generate text (> 3 Mins).
- Groq is a brand new technology that allows accessing LLAMA 3 via a cloud environment and utilizes a Groq treats model as a data source and uses a query language to get answers thereby bypassing the need of a kernal.
- Gradio a a library that builds the webpage in python via a three commands only, and saves enormous amount of coding and infrastructure.

Full Article (Link)	Prompt Used	Generated Review Article
NASA Scientists on Why We Might Not Spot Solar Panel Technosignatures	Write a 50 word review article	NASA researchers have explored the possibility of detecting advanced extraterrestrial civilizations through their energy signatures. A recent study suggests that if such civilizations exist, they may be hard to detect due to modest energy requirements, making them invisible to current telescopes. The findings have implications for the Fermi paradox and our understanding of life beyond Earth.
Deadpool & Wolverine review – Marvel's achingly meta new sequel is going to be huge	Write a 50 word review article	Deadpool & Wolverine is a hilariously obnoxious romp, with Ryan Reynolds and Hugh Jackman's explosive double act delivering laughs despite the film's slapdash, repetitive, and shoddy visuals. The gore and risqué gags earn its 15 certificate, making it a guilty pleasure that will likely be a huge hit.
Could Australia become a green hydrogen superpower?	Write a 50 word review article	Australian green energy firm Hysata is pioneering the production of the cheapest hydrogen in the world by eliminating bubbles in electrolysis. With a specialized material, they can produce hydrogen 20% more efficiently than conventional methods. This breakthrough could make Australia a leader in green hydrogen export, paving the way for a cleaner energy future.

Summary and Future work

1. A web interface for generating article summary has been established at UMD.
2. The interface also works for generating code in multiple languages.
3. Members are welcome to use it and give feedback to improve and customize it for their needs
4. Future would like to build a prompt library and RAG customized to ESSIC researchers.

Groq API