

EE/CprE/SE 491 WEEKLY REPORT 10

10/24/2024 – 10/30/2024

Group number: 42

Project title: GridGPT 2.0

Client &/Advisor: Gelli Ravikumar

Team Members/Role:

Luke Eitzmann -OpenDSS-Lead

Ian Louis - Power Co-lead

Scott Rininger - Power Co-lead

Aditi Nachnani - Full Stack AI Co-Lead

Ian Bussan - Full Stack AI Co-Lead

- **Weekly Summary**

This week, we met with our advisor Dr. Gelli to present our research from the previous week. The grid team worked on researching existing virtual power plant management softwares to find possible features for gridGPT. The Grid team has also begun to use python to control the functions of OpenDSS. The Grid team also collaborated with the AI team to experiment with making a GPT specifically for DSOs. The AI team looked into how GPT would be used with DSO applications. We also looked into multiple user threads with asynchronous I/O and structured output.

- **Past week's accomplishments**

- **Luke Eitzmann:** This week I've been working on using Python coding to use OpenDSS. I followed the Python tool provided by EPRI, but next week I will use alt-DSS instead.
- **Ian Louis:** I researched different commercially available softwares for VPP management. I looked into these softwares to find possible features for gridGPT.
- **Ian Bussan:** I worked with Scott to consider how GPT would be used with DSO applications. We came up with 3: anomaly detection, simulation, and automated customer support. We used OpenAI to simulate multiple DSO applications and data.
- **Aditi Nachnani:** This week, I looked into multiple user threads, and how to separate the

context for each thread. I also looked into asynchronous I/O to run multiple sessions concurrently. Lastly, I looked into structured output to produce responses in a more structured way.

- **Scott Rininger:** I met up with the AI team to discuss making a GPT. We narrowed down our scope to simulating a DSO that focuses on demand response. We created a system instruction for ChatGPT to use. We experimented with it and documented our results. I also made a list of questions to ask our client.

- **Pending issues**

- No issues

- **Individual contributions**

<u>NAME</u>	<u>Individual Contributions</u> <i>(Quick list of contributions. This should be short.)</i>	<u>Hours this week</u>	<u>HOURS cumulative</u>
Luke Eitzmann	I Researched and practiced using python coding to direct OpenDSS.	6	42
Ian Louis	I researched 4 different VPP management softwares and found several possible features to add to gridGPT	6	42
Scott Rininger	Created a system instruction for ChatGPT to follow. Experiment with the GPT and documented my findings	6	42
Aditi Nachnani	Implemented multiple user threads with async I/O and structured output.	6	42
Ian Bussan	Researched application of DSO using GPT for applications	6	42

- **Plans for the upcoming week**

- **Scott Rininger:** I am journeying back into market research. The client asked me to create a map of the interactions between the actors in a DSO, so that's what I will do.

- **Ian Louis:** I will look into new VPP optimization strategies and other VPP management softwares.

- **Luke Eitzmann:** My plans for this upcoming week are to figure out how to use alt-dss, and learn how to use Google Colab, as these two tools will be very beneficial in our final project.

- **Ian Bussan:** I will examine how docker containers state management between GPT and

different docker applications. Also, look into the data stream into GPT.

- **Aditi Nachnani:** The plan for next week is to look deeper into context state management with Thread API and how context can be shared among users.

- **Summary of weekly advisor meeting**

This week we discussed our individual progress with Dr. Gelli. The Grid team presented the research we did this week about our special topics. Scott and Ian Bussan presented on the DSO-GPT they made and experimented with, Luke practiced using python coding to use OpenDSS functions, and Ian presented on different possible features for VPP management with gridGPT. The AI team is looking more into learning about GPT state management, in the context of the state management of web threads and docker containers. In addition to learning about how to implement GPT with streaming data.