EE/CprE/SE 491 WEEKLY REPORT 11

10/30/2024 – 11/7/2024

Group number: 42

Project title: GridGPT 2.0

Client &/Advisor: Gelli Ravikumar

Team Members/Role:

Luke Eitzmann -AltDSS-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 team also researched virtual power plant optimization algorithms. The Grid team has also begun to use AltDSS to analyze the values of OpenDSS circuits. The Grid team worked on a map of how actors in a distribution system operator interact with each other. The AI team looked into predicting the monthly energy for Iowa residents using TimeGPT. We also looked into context sharing within users and how to utilize the Threads API to keep track of the conversation history.

- **Past week's accomplishments**

  · **Luke Eitzmann**: I spent the week experimenting with AltDSS and learning how it applies to the OpenDSS software.

  · **Ian Louis**: I researched different commercially available softwares for VPP management. I looked into these softwares to find possible features for gridGPT. I also researched a new VPP optimization method.

  · **Ian Bussan**: This week, I used TimeGPT, I used it to predict the monthly energy for Iowa residents. In addition, I used Docker first time and deployed a docker container and volume

for testing and shared data through docker

· **Aditi Nachnani**: This week, I looked into context sharing and how the same context can be shared among users. I also looked into the Threads API and how to create, retrieve, modify, and delete threads.

· **Scott Rininger**: This week I started to make a map of how actors in a distribution system operator interact with each other. I made a presentation to show the client.

- **Pending issues**

  · No issues

- **Individual contributions**

NAME	**Individual Contributions** *(Quick list of contributions. This should be short.)*	**Hours this week**	**HOURS cumulative**
Luke Eitzmann	I Researched and practiced AltDSS coding and its applications with OpenDSS.	6	48
Ian Louis	I researched 2 different VPP management softwares and found several possible features to add to gridGPT. I also researched a new way of optimizing VPPs for the electricity market.	6	48
Scott Rininger	I started a google form sheet to display the numerous agents in a DSO system and how they interact.	6	48
Aditi Nachnani	Implemented context sharing and threads API using OpenAI.	6	48
Ian Bussan	Docker application testing, TimeGPT implementation	6	48

- **Plans for the upcoming week**

  · **Scott Rininger**: For this upcoming week I am going to finish the map of how the actors of the DSO system interact with each other. I am also going to collect DSO materials to share with the rest of the team.

  · **Ian Louis**: I will work making my optimization script in google collab compatible with OpenDss. I am planning to use the altDSS library to accomplish this.

  · **Luke Eitzmann**: My plans for this upcoming week are to figure out how to add large circuits to AltDSS, and I plan to document all the useful AltDSS commands I find.

· **Ian Bussan**: I will test deploying a docker application to GridAI, and test being able to run this container in our GridAI. In addition, use the ChatGPT prompt for the docker application.

· **Aditi Nachnani**: The plan for next week is to familiarize myself with Grid AI's codebase. I will also look into sharing the context for their given models. I will also research what database to use to store threads.

- **<u>Summary of weekly advisor meeting</u>**

  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 started on a Google sheet to map the interaction between the actors of a DSO, Luke practiced using AltDSS coding to analyze OpenDSS circuits, and Ian Louis presented on different possible features for VPP management with gridGPT. Ian also presented a new VPP optimization method. In this weekly advisor meeting we learned about the architecture of GridGPT and how to build our components in GridGPT. We learned we will be deploying 3 to 5 containers for GridGPT.