EE/CprE/SE 491 WEEKLY REPORT 4

August 2024 – May 2025

Group number: 42

Project title: GridGPT-2.0: AI Virtual Assistants for the Smart Grid Applications

Client &/Advisor: Gelli, Ravikumar

Team Members/Role:

Ian Louis - Power Co-Lead

Scott Rininger - Power Co-Lead

Aditi Nachnani - Full Stack AI Co-Lead

Ian Bussan - Full Stack AI Co-Lead

Luke Eitzmann - Power Co-Lead

- **Weekly Summary**

  The goal of this week was to meet with our advisor Dr. Gelli to present our research from the previous week. The grid team researched prosumers, During this meeting we informed Dr. Gelli about our backgrounds and skills that can be applied to this project. After our initial meeting with Dr. Gelli gave goals for the Grid and AI teams to complete before our next meeting. The grid team's goal was to research distributed energy management systems(DERMS). The AI team's goal was to research potential AI models for the project.

- **Past week accomplishments**

  · Luke Eitzmann: I did research on current DERMS, specifically the GE Opus One DERMS. My research focused on the pros and cons of DERMS and how we can improve them.

  · Aditi Nachnani: I researched and took notes on different LLMS models like ChatGPT and GEMINI. I also looked at Hugging Face and familiarized myself with different AL/ML terminologies. Other than that, I also took notes on the programming language Go.

  · Ian Bussan: Researched LLM models: ChatGPT and LLaMA. Learned more about ChatGPT's

new model that came out this week: o1- Preview, and if there is any use case for it in this project. Also learned about Hugging Face, which I have not learned anything about until now.

· Ian Louis: I did research on the functions,applications, and areas of improvement of DERMS. I also did research on the siemens gridscale X DERMS

· Scott Rininger: I researched DERMs for our upcoming meeting with the client. Specifically I looked into AutoGrid and how they use AI with their solutions.

- **Individual contributions**

NAME	**Individual Contributions** *(Quick list of contributions. This should be short.)*	**Hours this week**	**HOURS cumulative**
Luke Eitzmann	Researched DERMS ● GE Opus One Worked on our DERMS presentation for Prof Gelli	6	6
Aditi Nachnani	Researched LLM models ● ChatGPT ● Gemini Looked at Go and Hugging Face Worked on the presentation for the next meeting	6	6
Scott Rininger	Researched DERMS ● AutoGrid Worked on our DERMS presentation for Prof Gelli	6	6
Ian Louis	Researched DERMS ● Siemens Gridscale X Worked on our DERMS presentation for Dr. Gelli	6	6
Ian Bussan	LLM Models ● ChatGPT o1 preview ● LLaMA Learned more about Hugging face Learned about Go	6	6

- **Plans for the upcoming week**

  · Luke Eitzmann: Finish DERMS presentation and research more DERMS example.

  · Scott Rininger: Finish working on the DERMS presentation and do more project research.

  · Aditi Nachnani: Continue researching LLM models, learning the terminology, and reviewing Go and Python

  · Ian Louis: Continue to research different DERMS and areas where DERMS can be improved

  · Ian Bussan: Learn about more use cases for LLM models, and research which models will be best for electrical grid applications if applicable. Learn more general knowledge about electrical grids. Research Go backend framework.

- **Summary of weekly advisor meeting**

Dr Gelli gave us an overview of GridGPT and its function and history. He also explained to us the end goal and applications of GridGPT. He split our group into two different teams: the grid team consisting of the electrical engineers in our group and the AI team consisting of the software engineers in our group. At the end of the meeting he gave us the goal of further researching our respective topics before our next meeting. He discussed that we should learn about AI models: ChatGPT, Gemini, Hugging Face, and LLaMA. In addition, telling the AI team to have a general understanding of these AI models and learn how to use them in code applications.