GridGPT

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Project Overview

The GridGPT project aims to simplify power grid management and will explore the potential of Artificial Intelligence at this time to streamline the interpretation of complex and evolving power system data.

It will translate distribution system simulator (DSS) scripts into natural language for efficiency in the plant's maintaining employees (grid operator, engineer, technician).

Project Goals:

Enhance integration of new power sources

Mitigate flow issues in existing equipment

Improve accessibility and time management with easier data for a human on the job.

Project Management Style

Agile Methodology

- Flexibility and Adaptability: Iterative progress allows us to adapt to changes quickly. This is good in responding to new insights or challenges that emerge during the development process
- 1 week sprints: We meet with our advisor/client weekly to discuss progress, share ideas, and receive feedback for continuous improvement.
- Rapid Prototyping and Feedback: Short sprints allow us to break down complex tasks into manageable chunks. We are able to create prototypes, test hypotheses, and refine ideas based on immediate feedback.

Task Decomposition

AI Training → Learn how to fine-tune an AI model on hugging face. Work with Electrical Engineer to understand electrical grid data and come up with datasets to train AI model with.

AI Integration → Work with Backend to build a module for the AI application.

Backend → Develop APIs and connect to databases.

Frontend → Make the application user friendly and appealing.

Power Systems Specialist → Provide detailed knowledge about electrical grids and .dss (Distribution System Simulator) data and help create dataset.

Key Milestones and Metrics

Milestone 1.1: The AI model can run successfully.

- The AI model can run without encountering any bugs/errors.

Milestone 1.2: The AI model can successfully interpret a DSS file.

- The model successfully goes through a DSS file with no bugs/errors.

Milestone 1.3: The AI model can run efficiently.

- The model can run at a reasonable speed and power consumption rate.

Milestone 2.1: The AI model can successfully interpret a DSS file and return something back to the user.

- The model can run and return something back to the user, regardless of what format it returns.

Milestone 2.2: The AI model can successfully interpret a DSS file and return its interpretation to the user in a language the user can understand.

- The model can run and return what it can interpret in a language that is legible to the user (in this case, English)

Risks and Mitigation Strategies

Costs: We plan on fine-tuning a model which may take up lots of resources.

Time Constraints: There's a lot of work to do

Training resources: AI model training can stress our personal computers, so our resources on training the model are limited.

Handoff: Our customer have given us many different use cases and things that we can build to help this ongoing project. Our mission is to create scalable software and proper documentation that we can hand off to the next group of developers to finish.

Conclusions & Questions

- The team's main focus is on making and implementing the AI model into the project. There are other moving parts that go along with it, but those will be tackled as we progress through the design, development and implementation.