

Agentic AI for Automated Data Extraction and Comparative Graph Analysis

Sakshi Ritesh Katargamwala, B.S Computer Science

Mentor: Nicholas Rolston, Assistant Professor

School of Electrical, Computer and Energy Engineering



Objective & Research Question:

Can Agentic AI automate and improve data extraction from scientific graphs to accelerate model development in sustainable energy research?

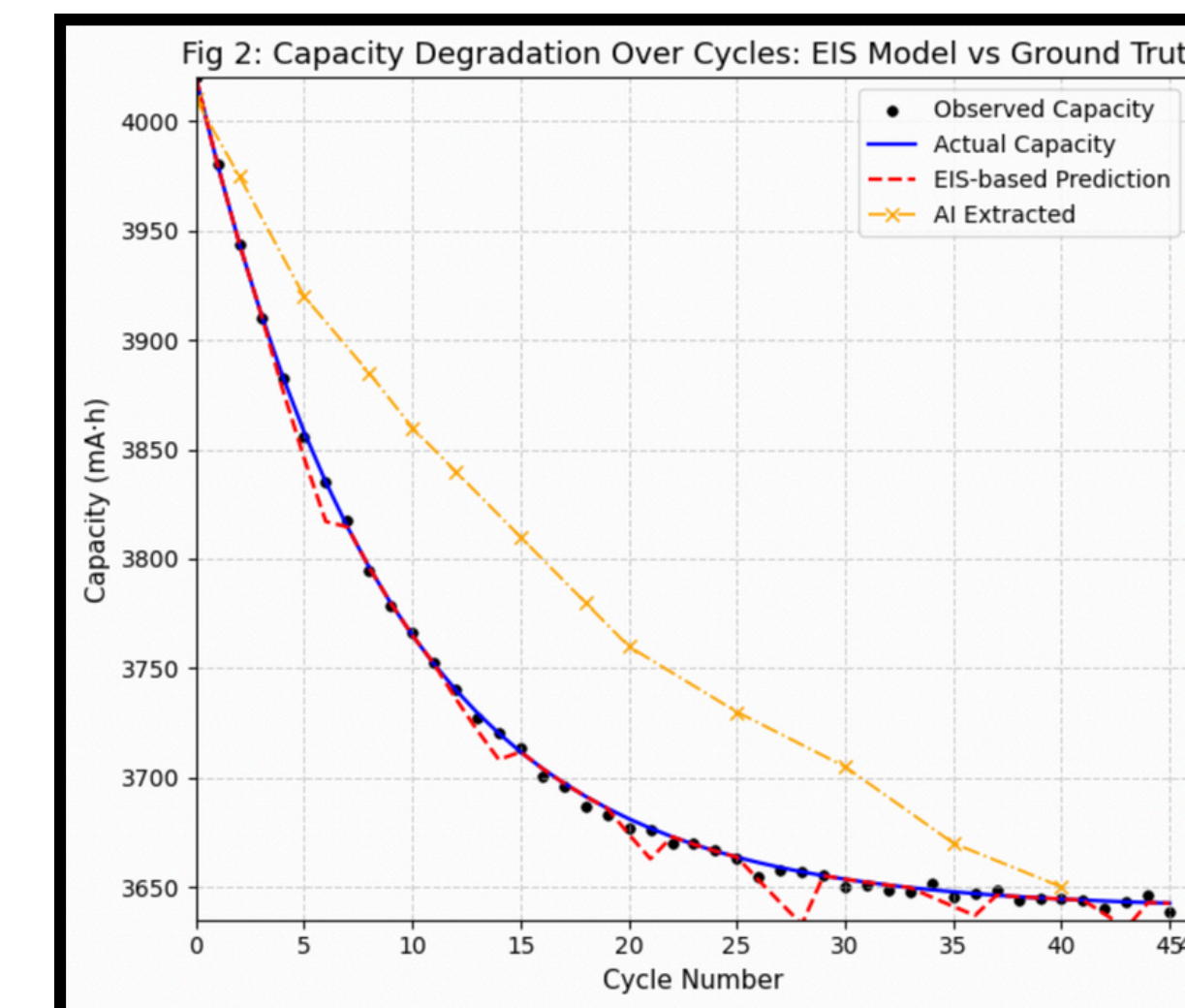
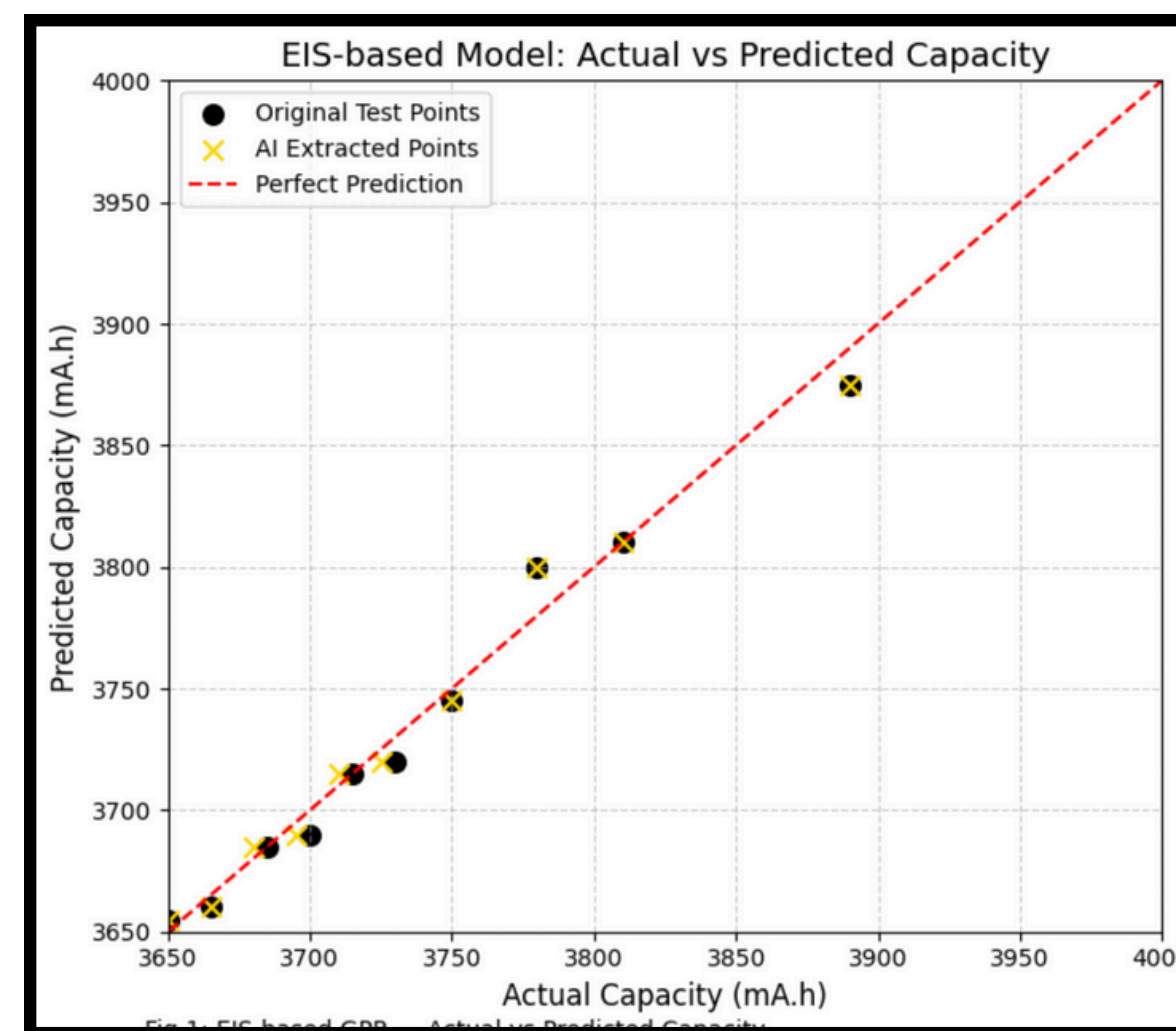
Background:

Manual data extraction from figures is time-consuming and prone to error. Agentic AI, combining language and vision models, enables automated interpretation of plotted data. This study compares ChatGPT (GPT-5) and Claude 4.5 for numerical accuracy and curve fidelity.

Methods:

Graphs from previous FURI work were processed using ChatGPT and ClaudeAI. Extracted coordinates were reconstructed in Python and compared to original plots based on mean error and visual similarity.

Claude:

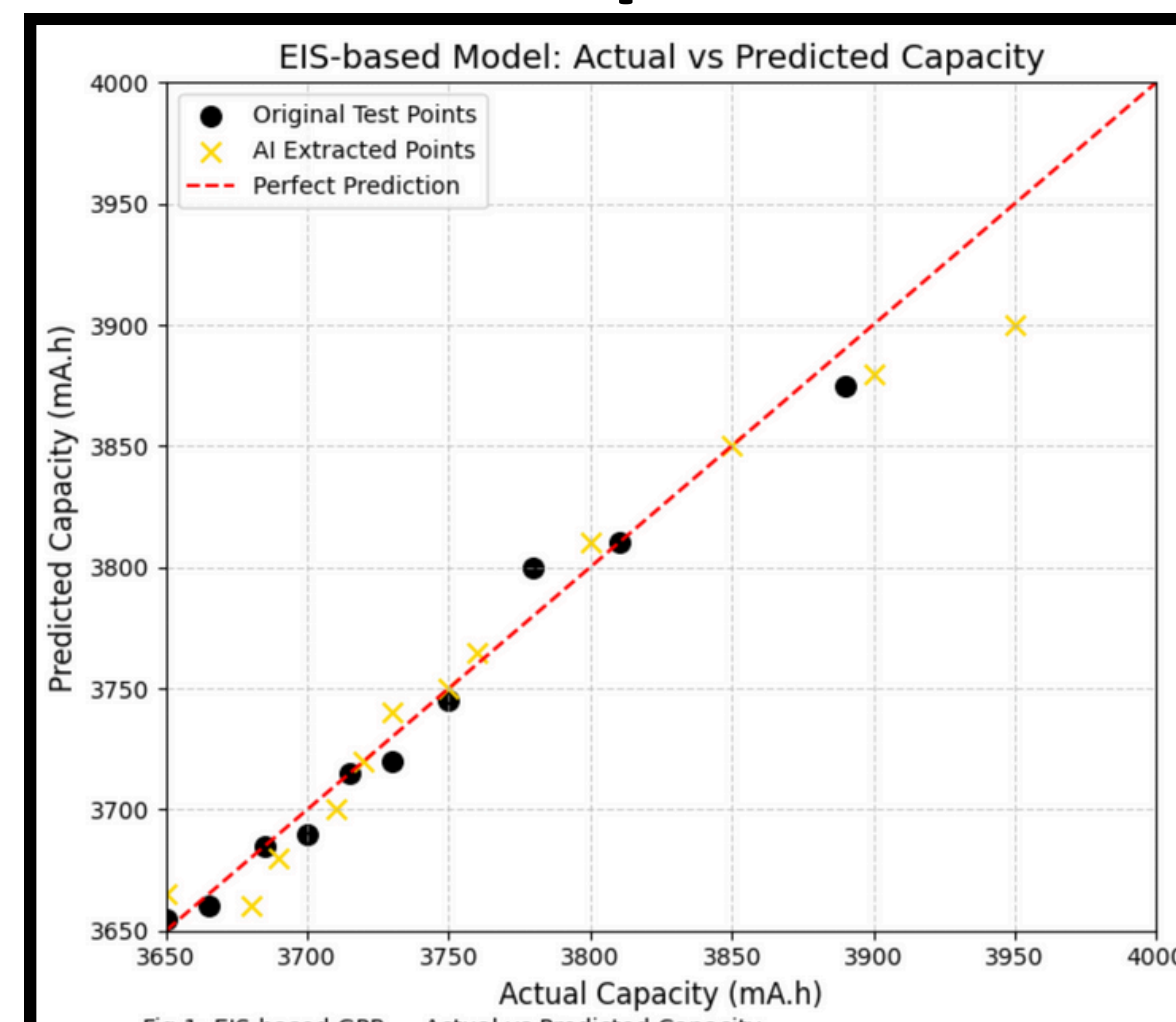


Results for Claude:-

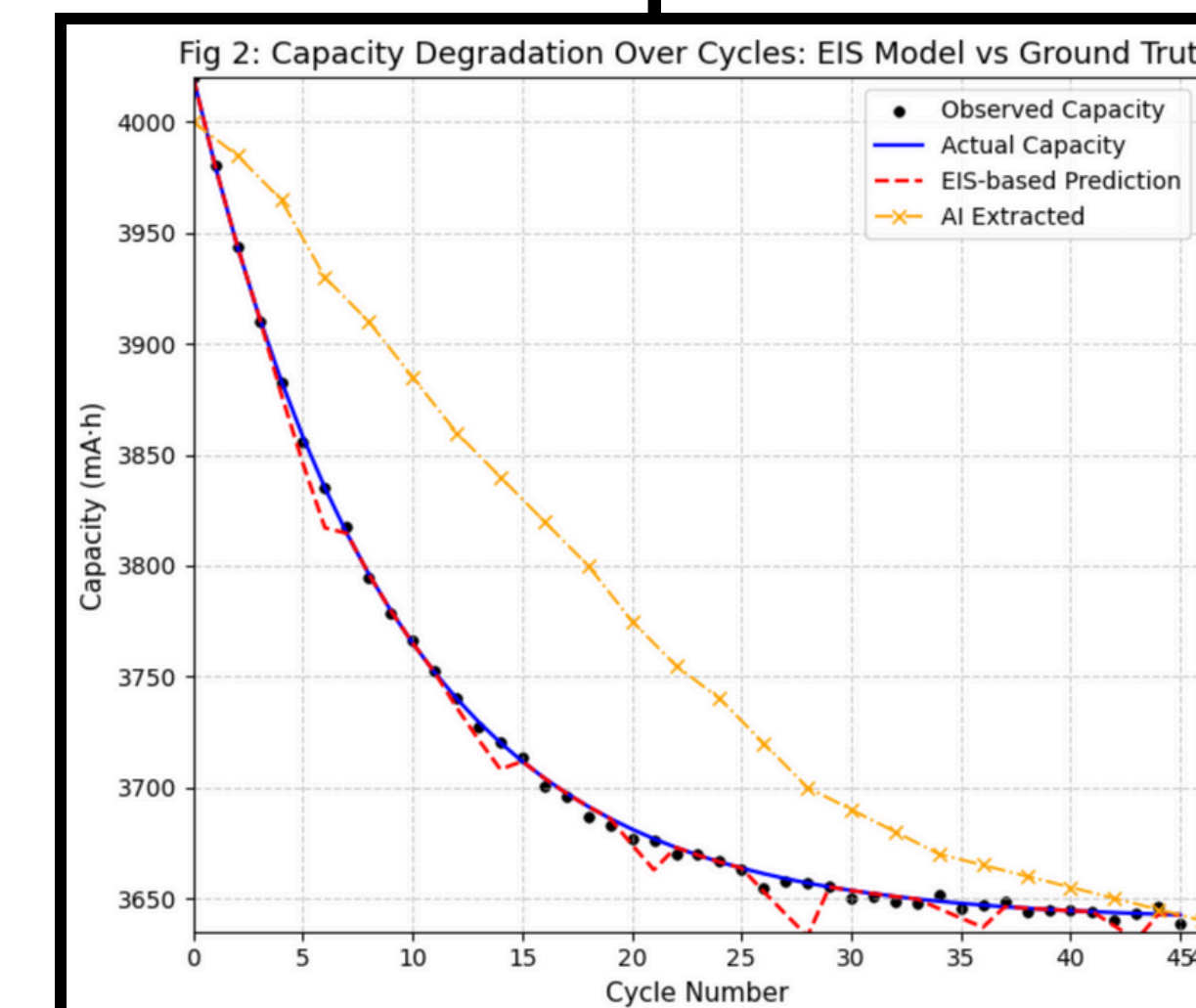
Graph 1: Minimally scattered and accurately matched.

Graph 2: Less accurate at capturing the exponential behavior of the line plot and diverged from the data.

ChatGPT: Graph1



Graph2



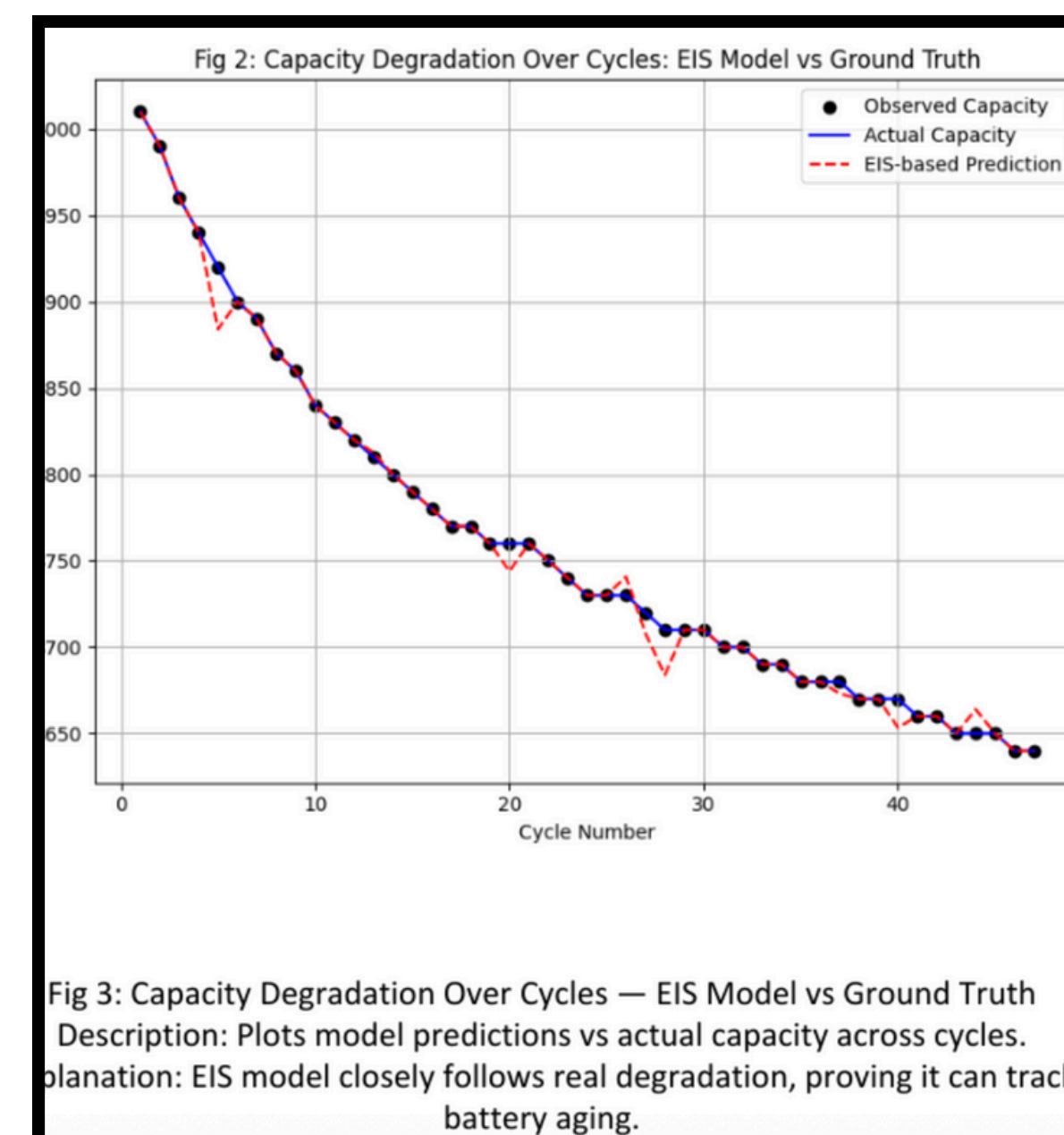
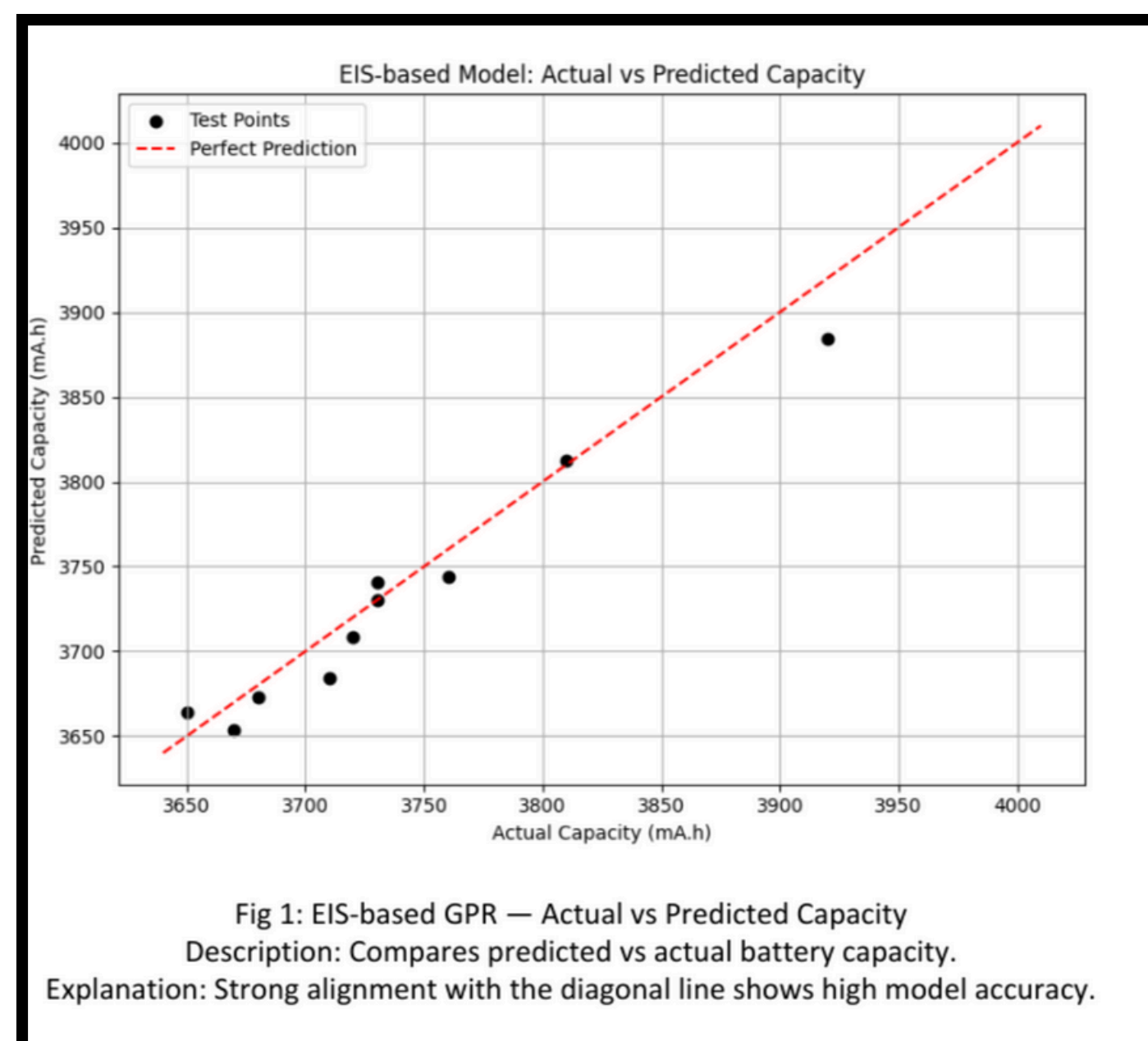
Results for ChatGPT:-

Graph 1: Less precise at capturing the data points than Claude

Graph 2: Similar behavior to Claude, unable to capture the exponential decrease of the data.

Conclusion & Future Work:

Agentic AI performs struggles with complex visuals. Future work will improve robustness through adaptive extraction and error correction.and continued testing of new models such as Landing AI and others



Graph1: ML-based scatter plot of predicted vs. actual battery capacity.

Graph2: Line plot of battery capacity degradation across cycles.

Acknowledgment:

Graphs adapted from prior FURI research by Aayush Swami, used as reference data for AI extraction analysis.

FURI

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