

Agentic AI for Automated Data Extraction and Comparative Graph Analysis

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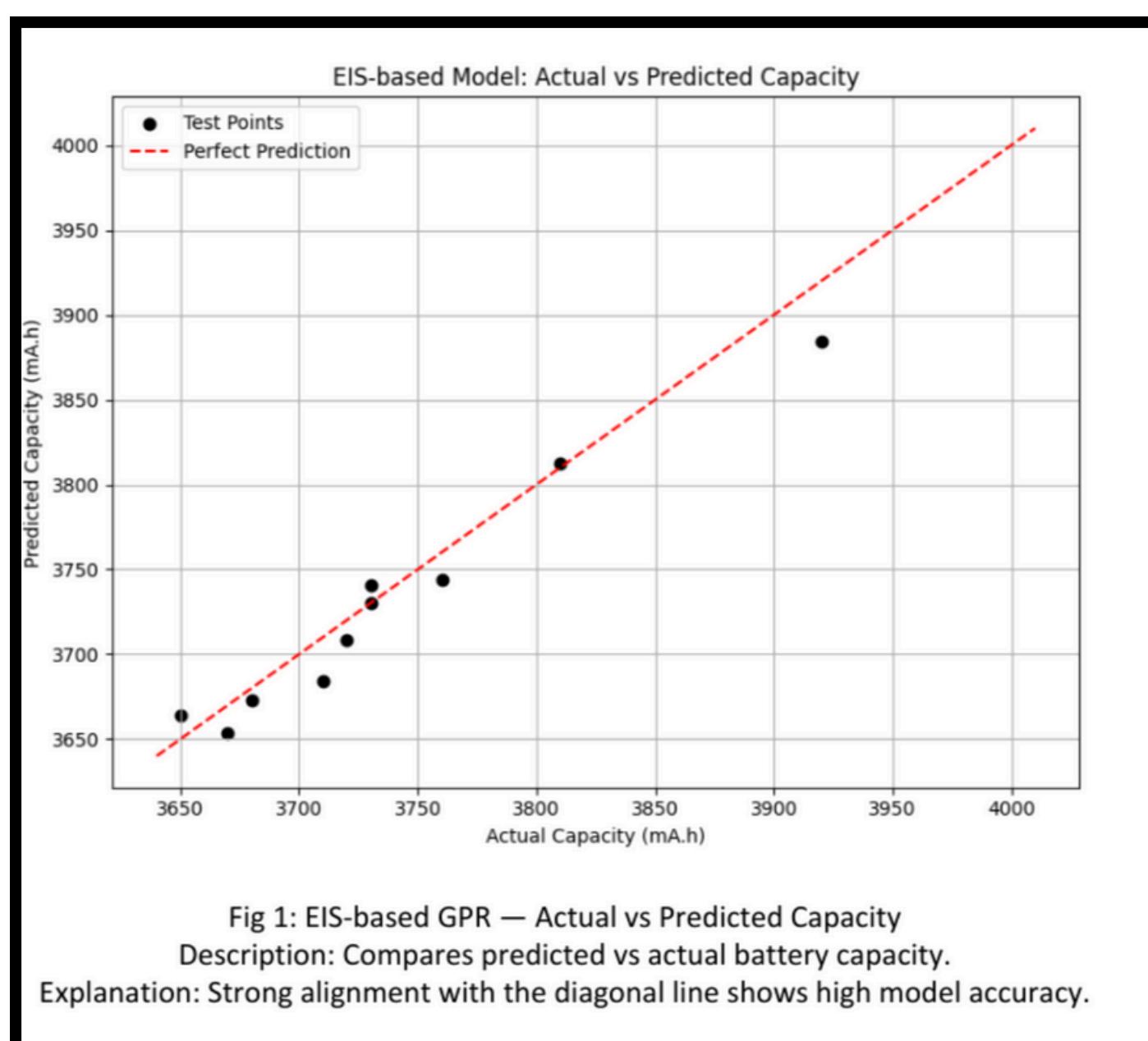


Objective & Research Question:

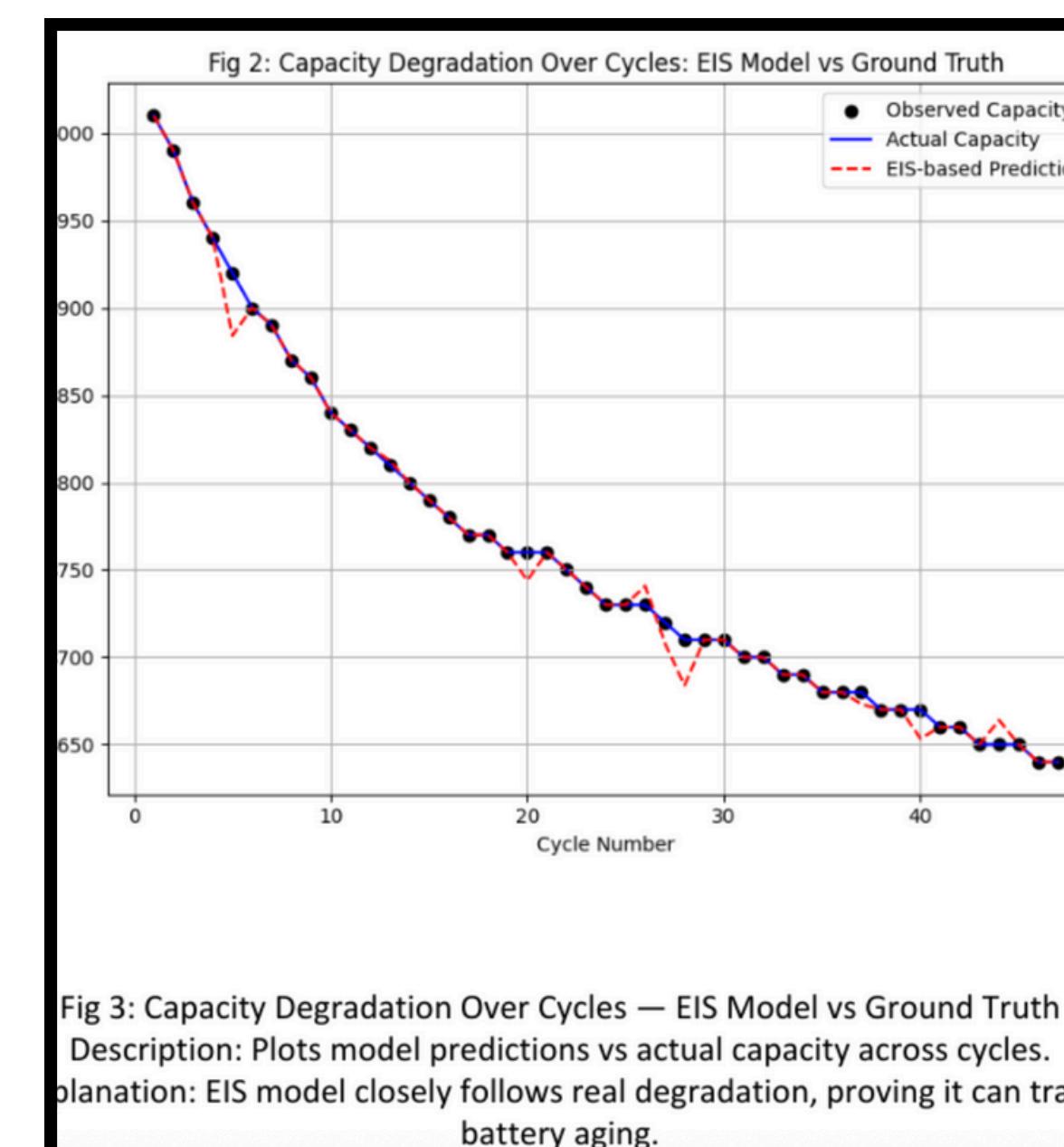
Can Agentic AI automate and improve data extraction from scientific graphs to accelerate model development in sustainable energy research?

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.



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

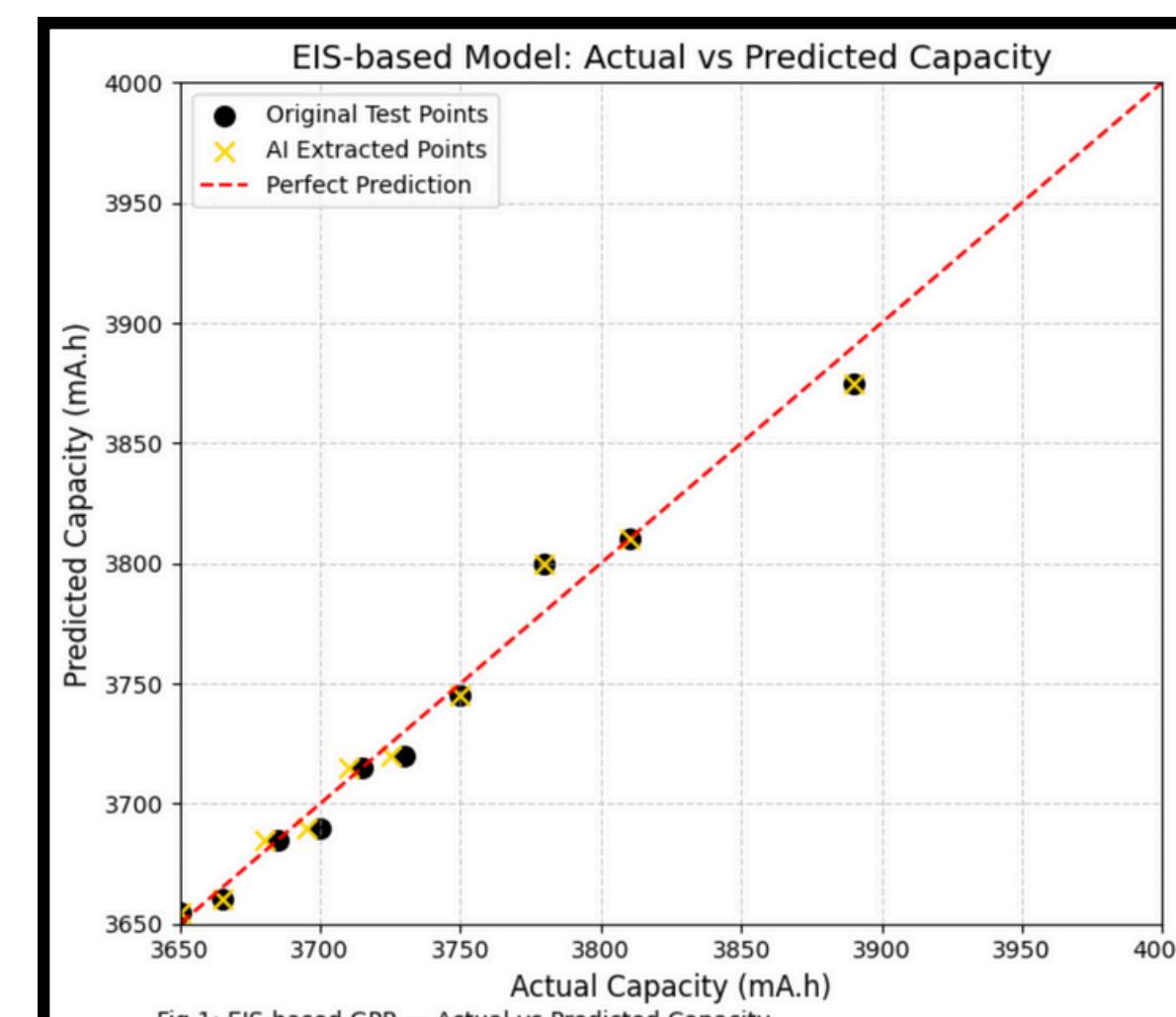


Graph2: Line plot of battery capacity degradation across cycles.

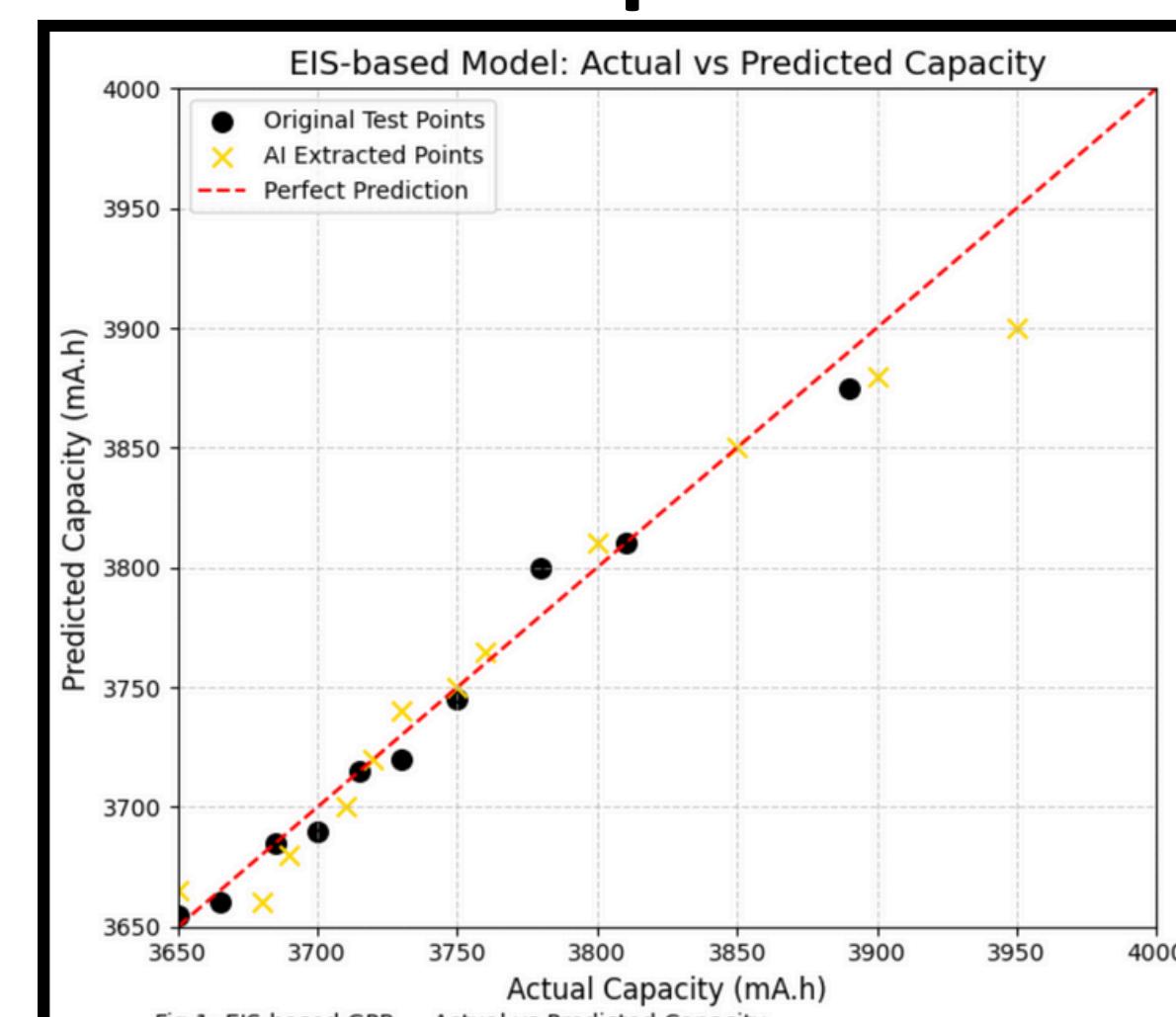
Methods:

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:

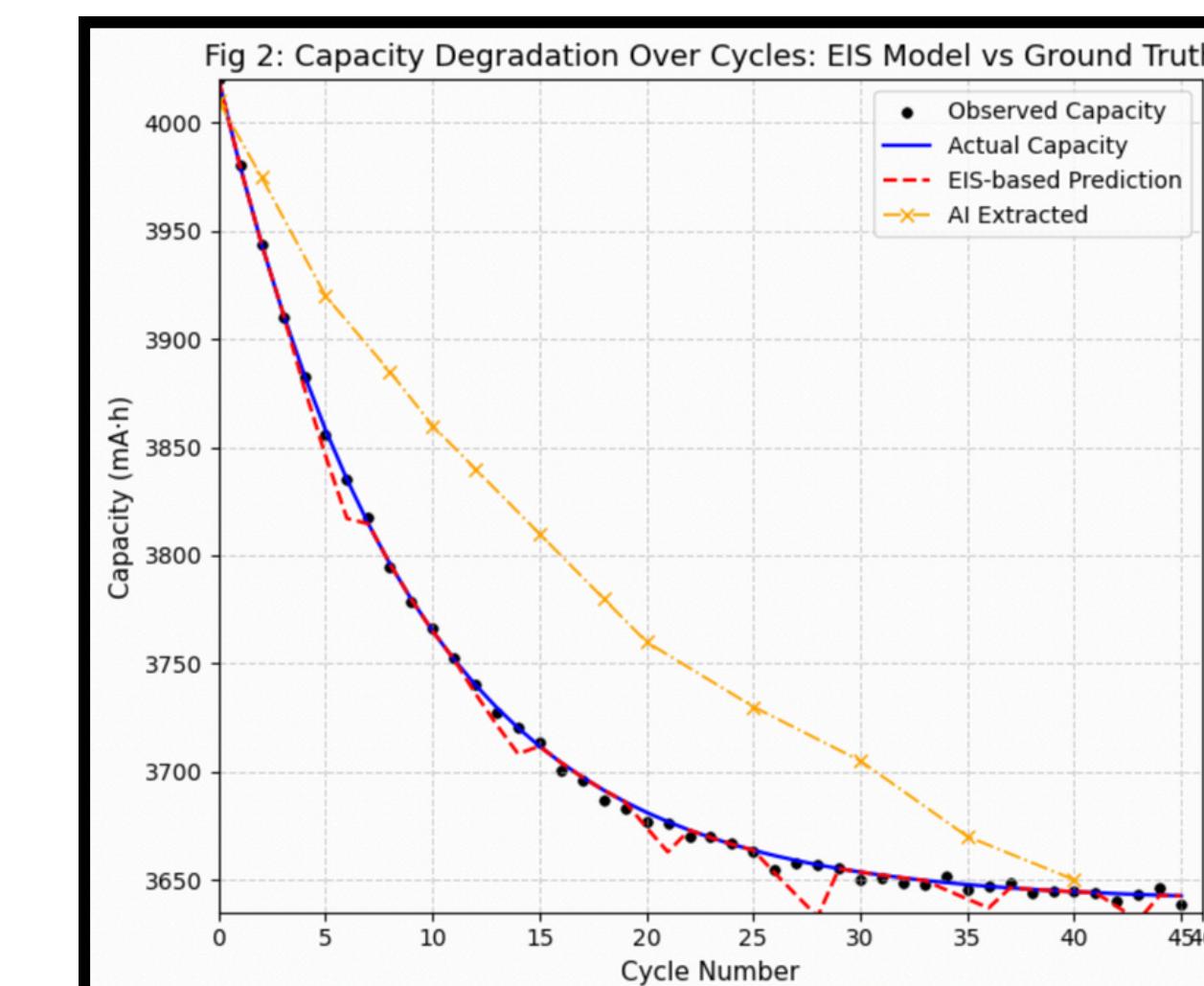


ChatGPT: Graph1

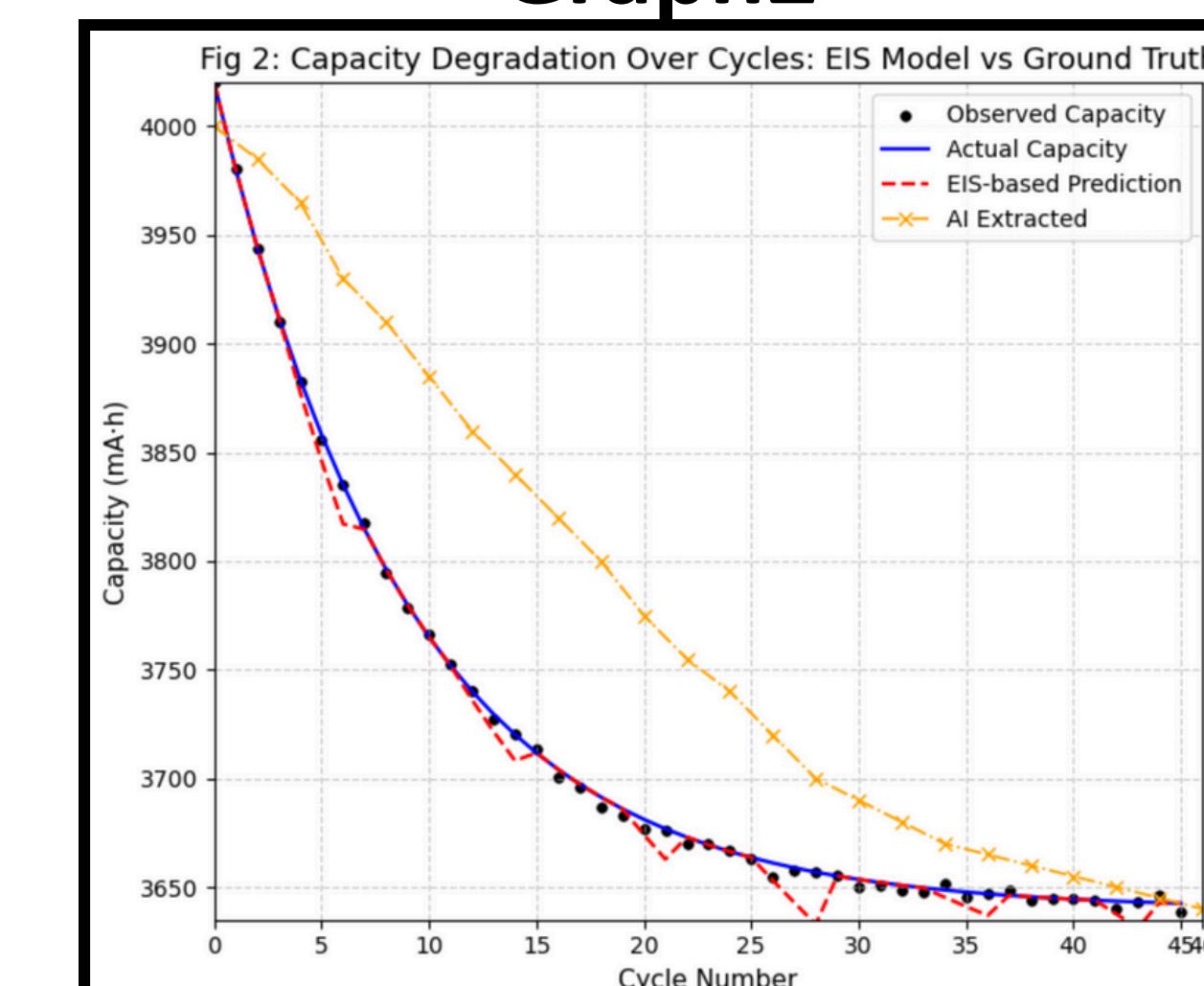


Conclusion & Future Work:

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



Graph2



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.

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.