Hardware-In-Loop Battery Test Bed

UAH Fall 2024 ECE Senior Design Project

Project Overview

The senior design project is a large-scale project for senior engineering students at UAH. Teams are voluntary teams of up to four students who want to take on a similar project. For one semester, the team of students will work diligently to design, build, test, and deliver their project to the school or their sponsor.

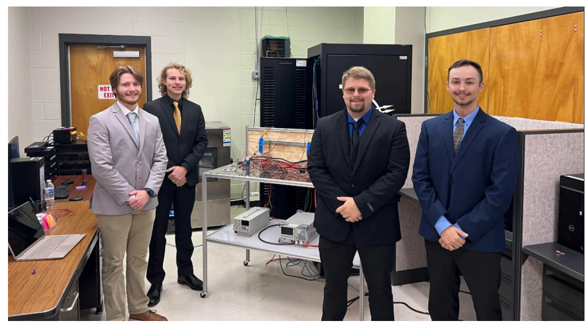
Our project is a long-term project that was originally started spring of 2024. Our project was to rebuild, redesign, and improve the previous system. Our goal was to build our own Hardware-In-Loop Battery Test Bed that could charge and discharge a Li-Ion battery.

We ended up creating all new software, hardware, and system integration to complete our project.

Technical Specs

We used an environmental chamber, Li-Ion batteries, Opal RT, and Simulink as our main system components. We used these main concepts to test our batteries.

Battery Brigade



This is the battery Brigade. Here from left to right Sam Pugh (Team Lead), James Allen (Software Lead), Case Corder (Research Lead), Cody Foster (Hardware Lead).

The input was taken from our Simulink GUI and was then sent to our circuit to realize the request. Then Opal RT would collect necessary data from the battery that is set in the environment chamber.