HAOCHENG ZHANG

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SKILLS

Python, Matlab, Simulink, Scikit-Learn, Tensorflow, Pandas, Vector CANalyzer, dSpace ControlDesk

EXPERIENCE

University of Waterloo EcoCAR Team
Vehicle Controls Team Lead Feb. 2021 to Current

- Re-engineered production SUV into a P4-Parallel-through-the-road hybrid electric vehicle
- Led team of 6-10 members in developing vehicle supervisory, powertrain, and body controls
- Responsible for feature development from requirements definition to trackside validation
- Placed 5th out of 11th in a student competition sponsored by General Motors and the US DOE (link)
- Recognized in dSpace publication for overcoming COVID related challenges (link)

Vehicle Controls Developer May 2019 to Feb. 2021

- Developed vehicle state machine and component communication interfaces in Simulink
- Conducted one-at-a-time sensitivity analysis on vehicle model to determine effects on vehicle performance

Lixar IT.
Data Science Intern Jan. 2020 to Apr. 2020, Jan. 2021 to Aug. 2021

- Developed forecasting and anomaly detection models for energy trading using Python, Sklearn, FbProphet
- Designed content based recommendation system using universal sentence encoder for improving energy sales

University of Waterloo
Battery Modeling Research Assistant Jan. 2018 to Apr. 2018, Sept. 2018 to Dec. 2018

- Developed fault detection algorithm for a commercial Battery Management System sensitive to 0.15% error in MATLAB
- Constructed equivalent circuit models for voltage and state-of-charge models in MATLAB
- Parameterized cells using hybrid pulse power characterization (HPPC) to obtain model fitting data

PROJECTS

Battery Plant Model

- Led equivalent circuit model and battery controller model development for hybrid design team
- Achieved 47% error (RMSE) reduction from existing linear resistor model
- Parameterized cell model using hybrid pulse power characterization (HPPC)

Grid Storage Model

- Designed and optimized an energy storage system for the University of Waterloo campus using Python and Gurobi, reducing annual CO2 emissions by 4 tons

Hybrid Vehicle Torque Control Strategy

- Designed and developed a rule based torque control strategy in Simulink, achieving 79% increase in MPGe
- Optimized algorithm through software-in-the-loop (SIL) development
- Validated algorithm through hardware-in-the-loop (HIL) and vehicle-in-the-loop (VIL) testing

EDUCATION

University of Waterloo May 2022
Bachelor of Applied Science Chemical Engineering
Fall 2018 Research Award Recipent
Winter 2017 Dean's List