Jinghu Hu

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PROFESSIONAL SUMMARY

- ME Ph.D. candidate with research expertise in battery thermal runaway characterization testing and modeling

- Prototyped test apparatus and performed lithium-ion battery failure tests to characterize 18650 cylindrical and A123 pouch battery cells thermal runaway propagation behaviors

- Developed high-fidelity CFD and reduced-order models to simulate battery pack thermal runaway propagation under different scenarios

- Designed a LabVIEW Real-Time system and achieved flexible operation control on an on-market engine by integrating the on-engine actuators and sensors

- Skilled at using CFD software including ANSYS and CONVERGE; rich experience in developing using Python, MATLAB and Simulink, C/C++, Rust and Git; proficient at SOLIDWORKS

EDUCATION

the University of Texas at Austin, Austin, TX   Aug. 2018 - Expected May 2023

- Ph.D. in Mechanical Engineering, thermal fluids track, GPA: 3.9/4.0

Tsinghua University, Beijing China

- MSc in Thermal Engineering, GPA: 3.7/4.0   Aug. 2016 - Jul. 2018
- BEng in Environmental Engineering, GPA: 4.0/4.0   Aug. 2012 - Jul. 2016

PROFESSIONAL EXPERIENCE

Dept. Mechanical Engineering, the University of Texas at Austin   Sept. 2018 - present

Graduate Research Assistant

- Designed and prototyped test apparatus and performed test procedures to characterize 18650 cylindrical and A123 pouch cells thermal runaway failure behaviors and cell-to-cell failure propagation in battery arrays; implemented GC and FTIR techniques to investigate battery gas composition in different chemistry and formats of the cells

- Developed full-dimensional ANSYS CFD model and reduced-order simplified model to simulate lithium-ion battery cell-to-cell thermal runaway propagations inside battery module under different geometry configurations and failure modes

- Designed Real-Time control system for on-market engine sensors and actuators using NI LabVIEW; achieved flexible engine operation instrumentation, data acquisition and processing

- Developed improved fractal engine simulation CFD model that increased the combustion simulation accuracy within cylinders during transient engine speed; realized 40% lower HC emissions from conducted experimental and simulation research

- Realized at best 4% estimation error for battery SOC estimation by implementing extended

Kalman Filter (EKF) and Unscented Kalman Filter (UKF) for battery management systems

- Identified optimal fuel cell-battery energy management strategy for a commercial hydrogen fuel cell truck by formulating dynamic programming algorithm based on a MATLAB/Simulink powertrain model including electric motors, battery packs, hydrogen fuel cells

National Renewable Energy Laboratory   Apr. 2022 – Aug. 2022

Graduate Intern

- Developed high fidelity vehicle efficiency & range prediction model FASTSim in Python & Rust; expanded model application to European market vehicle for Google Map

- Developed high fidelity locomotive energy efficiency optimization model ALTRIOS in Python & Rust; established large-scale data-processing & parameter estimation pipeline using multiple objective optimization toolbox pymoo on AWS for ALTRIOS optimization

Dept. Thermal Engineering, Tsinghua University   Dec. 2015 – Jul. 2018

Research Assistant

- Prototyped high pressure gas nozzle jet flow experimental system for up to 50 MPa static pressure of gas jet flow generation and concentration measurement at free space and with obstacles

- Developed a reduced-order mathematical model for the high pressure hydrogen flow that reduced CFD computation time by ~98% using ANSYS Fluent

Samsung Research Center   Aug. 2016 – Dec. 2017

Text-to-speech Intern Engineer

- Developed, trained and deployed TensorFlow/Keras based sequential machine learning model to achieve multiple natural language processing tasks; achieved >80% reduction in model size and >90% accuracy rate in out-of-pocket test sets

- Developed and deployed universal deep-learning model decoder for text-to-speech engine based on C/C++; provided fast for fast Python-trained ML model implementation to C

SKILLS

- Experienced with battery thermal runaway characterization testing and modeling; knowledgeable in battery material, chemistry, and mechanisms; experienced with gas chromatography (GC) and Fourier-transform infrared spectroscopy (FTIR)

- Experienced with evaluating battery performance and reliability through electrical testing (Arbin)

- Experienced with state estimation methods (Kalman Filters) for battery management systems

- Experienced with system modeling (MATLAB and Simulink) and 3D modeling (SOLIDWORKS)

- Experienced with system instrumentation, data acquisition and processing (Graphtec, LabVIEW)

- Experienced with CFD simulation software (ANSYS & CONVERGE) and post-processing tools

- Proficient at Python; experienced with Python-based data processing and visualization

- Experienced with development using C/C++/Rust; skilled at version control tool Git