Karen Hinh
Mechanical Engineer

I'm a multi-disciplinary engineer who cares deeply about climate change, and I've have made it my life's goal to move us towards a more resilient future.

Experience

Lunar Energy

Lead Mechanical Design Engineer — July 2023 — present

Leading a multidisciplinary team to develop novel home battery storage solutions.

- Designed & validated a Battery Block Gen 1.1 subsystem through thermal characterization & 15-year reliability testing, led project from napkin sketch to production
- Managed cross-functional requirements, timelines & thermal system design for Gen. 1.5 Battery Block — achieved cost savings of $19/kWh
- Designed & validated a die-cast heat sink re-design using ANSYS Fluent CDF models & flow testing
- Designed & built a seismic testing fixture used for compliance testing
- Developed various assembly & check fixtures for battery manufacturing line
- Created load profiles for extreme cold & hot weather system performance from NREL data through python data & statistical analysis

Apple

SPG Battery Test Engineer — May — August 2022

Drove battery pack design by developing a deep understanding in the thermal abuse behavior of pack architecture.

- Created ANSYS transient thermal model to predict cell behavior — validated models through physical testing, achieved 90% accuracy for model results
- Designed & built test fixtures for cell thermal abuse testing
- Root-caused errors from pressure sensor output & devised new calibration methods to mitigate errors — improved sensor accuracy from ± 20% to ± 5%

SPG Product Design Engineer — May — August 2021

Developed a novel belt-drive mechanism with 90° of rotation from scratch.

- Coordinated with cross-functional teams to set functional requirements, designed & fabricated a fully functional prototype to prove out design concept
- Conducted modal & structural analysis in ANSYS for mounting brackets

Olin Formula SAE

Vehicle & Battery Team Lead — Sept 2019 — June 2022

Led new electric race-car development from clean sheet to functional vehicle in 12 months. First vehicle to successfully compete in 5 years.

- Onboarded 20 new engineers, coordinated multiple design cycles & prepared for competition during & post-COVID
- Developed first battery pack thermal characterization model for the team using MATLAB & CFD simulations in SimScale
- Owned the design of the HV battery pack structural systems — napkin sketch design, hand calcs, FEA, DFMA, manual machining & assembly

Swift Solar

Data Engineer — January — May 2021

Increased speed of solar cell development by developing automated Python data analysis scripts for cell characterization & a full-stack cell characterization data management system (custom UI for data input, Django back-end for data analysis).

Portfolio + Contact

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Education

Olin College of Engineering

B.S. Mechanical Engineering — May 2023

Education beyond standard curriculum.

- Numerical modeling and simulation
- Software application design
- Product life cycle analysis

Projects + Awards

VOLT: Capstone Project

September 2022 — May 2023

- Identified market opportunities in grid energy storage. Evaluated a set of technical solutions to determine the most viable go to market strategy.
- Assessed applicability of battery state-of-health (SOH) estimation and grid smart metering technology

Stanford Cleantech Hackathon, Finalist

May 2020

- Identified wildfire resiliency mitigation strategy through deploying municipal-scale energy storage at community centers
- Designed system architecture & business model for proposal

Skills

- NX
- SolidWorks
- OnShape
- SimScale
- ANSYS
- Python
- MATLAB
- Arduino / C++
- HTML / CSS / JS

- GD&T
- Tolerance stack-up analysis
- DFM / DFA
- FMEA
- 3-Axis Mill
- Lathe
- CNC Router
- Laser Cutter
- 3D Printer