

Bailey Sauter

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PRINCIPAL INTERESTS Renewable energy, power electronics, photovoltaic systems, energy conversion, electric vehicles, transportation electrification, embedded systems, algorithms, digital logic

ACADEMIC BACKGROUND ***B.S. Electrical Engineering, Computer Science*** Sep. 2018 - Jun. 2022
Oregon State University - Corvallis OR **GPA: 3.95**

- Focus Area: Power electronics
- Research: Undergraduate research in power electronics under Dr. Yue Cao
- Honors and Awards: Dean's List every quarter of study, Dean of Engineering's Scholarship, Award for best capstone project in the junior class
- Relevant Coursework: Power Electronics (ECE 431), Advanced Power Electronics (Graduate Course ECE 599, Spring 2022), Electric Vehicles (ECE 438), Electric Motors (ECE 331), Applied Robotics (ROB 421), Microcontroller System Design (ECE 473), Digital Logic Design (ECE 271), Computer Architecture (ECE 375), Intro to AI (CS 331), Algorithms (CS 325), Data Structures (CS 261)

Study Abroad Aug. 2021 - Dec. 2021
Technical University of Denmark - Kgs. Lyngby, Denmark

- Focus Area: Sustainable energy
- Relevant Coursework: Physics of Sustainable Energy (Graduate Course), Energy Conversion and Storage (Graduate Course), Future Energy Sources

EMPLOYMENT HISTORY ***Research Assistant*** June 2020 - June 2022
Oregon State University Energy Systems Lab, Corvallis OR

- Worked in Dr. Yue Cao's lab simulating, building & debugging high-efficiency, high-power DC-DC & DC-AC converters with applications in renewable energy.
- Coauthored "Control Architectures of Solar-Powered HVAC Systems: A DC-DC Converter's Perspective," **published in ECCE 2021**
- Rewrote the ECE 431 Power Electronics lab manual to improve the learning experience of students in that course.
- Designed & analyzed PCB schematics & board layouts for power electronics applications.
- Worked with a team of PhD students to research & implement solar power tracking algorithms.
- Maintained relationships with suppliers & purchased \$10,000+ of dollars of lab equipment.

Head Undergraduate TA Sep. 2021 - Jun. 2022
Oregon State Department of EECS, Corvallis OR

- Hired, scheduled & managed all undergraduate TAs for 2nd-year engineering course (ENGR 201).

- Met with professors weekly to coordinate & improve the teaching of the course, the assignments, labs, & exams.
- Created new material and altered old material to restructure the order of the course after observing what students struggled most with.
- Held class-wide review sessions of 100+ students.

Software Engineering Intern

May 2021 - Aug. 2021

Tektronix, Beaverton OR

- Developed an app in C++ for oscilloscope hardware emulation based on desired specifications from other teams, intended for use internally & by millions of customers.
- Wrote Python scripts for motherboard performance benchmarking & used results to make recommendations regarding future products to upper-level management.
- Learned & implemented principles of test-driven development & Agile

Undergraduate TA

Dec. 2018 - June 2021

Oregon State Department of EECS, Corvallis OR

- Taught labs and recitations of 20+ multidisciplinary students every week in 2nd-year engineering course (ENGR 201).
- Held 2-4 office hours per week offering students additional help with course material.
- Was responsible for the confidential grading of quizzes of 50-100 students per week.
- FERPA trained and compliant.

Research Assistant

June 2020 - Sep. 2020

Oregon State Artificial Intelligence & Robotics Research Lab, Corvallis OR

- Collaborated on a research project training a computer vision model to identify psychological traits in videos.
- Annotated 100+ videos & 1000+ images to train machine learning model.
- Reviewed & improved other students' work.

PUBLICATIONS

- N. Swaminathan, **B. Sauter**, Y. Cao, "Control Architectures of Solar-Powered HVAC Systems: A DC-DC Converter's Perspective," in Proc. IEEE Energy Conversion Congress and Expo (ECCE), 2021.

TECHNICAL SKILLS

- Programming Languages: C++, C, Python, MATLAB, System Verilog, Assembly Language
- Industry Tools: Eagle, MATLAB/Simulink, LTSpice, Git, Visual Studio, VS Code, Unix, Pycharm, ModelSim, Spice
- Languages: English, Spanish
- Other: Technical Writing, Test-Driven Development, Agile Development

SELECTED ENGINEERING PROJECTS

Solar-Powered HVAC system

- Researched, engineered, & built architectures for solar-powered HVAC systems.
- Resulting paper was published in the IEEE Energy Conversion Conference and Expo.

Waveform Compression Algorithm - Senior Capstone Project with Tektronix

- Researched, coded, optimized & analyzed a C++ compression algorithm for waveforms from remote oscilloscopes.
- Tasks included writing algorithm code, research on past existing compression algorithms, complexity analysis & waveform analysis of specific desired characteristics.

SCARA Drawing Arm

- Designed a custom PCB and wrote C firmware for a 3-axis robotic arm with SCARA topology.
- Arm was able to draw sound waves, demo programs & faces by interpreting G-codes and moving stepper motors accordingly

Force Sensitive Insoles - OSU Sports Engineering Club

- Designed, prototyped & wrote the C code for a shoe insole which measures & graphs user's foot motion on 2 axes using 3 force-sensitive resistors.
- Gave 5 minute product pitch at a startup competition in front of 5 judges.

Game Show Buzzer System

- Did RTL design & timing analysis for, simulated & programmed an FPGA in System Verilog to act as the buzzer, lights & scoring system for a fully functional "Jeopardy!" style trivia game.

Sudoku Solver

- Used test-driven development to make a PC app in Python that solves Sudoku puzzles of all difficulty levels using recursion

LEADERSHIP AND EXTRA- CURRICULARS

IEEE Power Electronics Society & the IEEE Power & Energy Society

- Served as webmaster for the OSU chapter of PES/PELS

Oregon State Sports Engineering Club

- Member of the OSU Sports Engineering Club for 3 years.
- Led a yearlong project from design stage to prototyping to pitch competition.

Eugene Family YMCA

- Volunteered as head coach of YMCA youth basketball teams for 2 years.

Oregon State Running Club

- 3 years of experience as a team leader with the Oregon State Running Club.