

Matthew Solar

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EDUCATION

University of Michigan

B.S. in Mechanical Engineering, Minor in Energy

Ann Arbor, MI

September 2021 - May 2025

- **Cumulative GPA:** 3.94/4.00 (William J. Branstrom Freshman Prize Recipient)

Coursework: Design & Manufacturing I & II; Fluid Mechanics I; Thermodynamics I; Control of Dynamic Systems, Dynamics & Vibrations; Mechanical Behavior of Materials; Solid Mechanics; Electrical Circuits; Laboratory I; Advanced Energy Solutions; Finite Element Analysis; Physics I & II; Calculus I – III; Differential Equations; Chemistry I; Intro to Computer Science (MATLAB and C++); AP Chinese Language and Culture

EXPERIENCE

Lawrence Berkeley National Laboratory

Mechanical Engineering Summer Intern - <CAD, Drawings, BOMs, Electronics>

Berkeley, CA

May 2023-Aug 2023

- Independently created many approved CAD parts, drawings, assembly drawings, and BOMs in Creo Parametric for the Center for X-ray Optics (CXRO) Permanent Magnet Small Bore Particle Accelerator R&D Project
- Effectively controlled the position of a DC motor through Arduino programming, soldering, and electronic communications skills
- Conducted weekly progress presentations to the Head of the Magnetics Department and a team of mechanical engineers and machinists, discussing design choices, tolerances, manufacturing strategies, quality assurance measures, and inventory management

Dasgupta Research Group at University of Michigan

RISE III Independent Study - <CAD, Drawings, Mill, Waterjet, Laser Cutter, SEM>

Ann Arbor, MI

Sept 2022-present

- Researching a new way to image solid-state batteries; studying lithium plating and stripping behavior using operando microscopy
- Delivering research progress updates to a team of Ph.D. students and the PI biweekly; presented findings at the bi-annual Mechanical Engineering Undergraduate Symposium
- Designed and manufactured a visual cell using SOLIDWORKS for design, and milling, water jetting, and laser cutting for manufacturing
- Fabricating solid electrolytes and solid-state batteries through Nissan Motor Company research funding

Spark (Electric Motorcycle Racing Project Team)

Aerodynamics Lead of Mechanical Team - <CAD, CFD, 3D Printing, Welding>

Ann Arbor, MI

Sept 2021-Apr 2023

- Led weekly meetings, guided team members by teaching CAE skills, discussed assignments and progress, and addressed their inquiries
- Designed motorcycle fairings using CATIA v5 Generative Surface Design and conducted design testing through CFD simulations using Star-CCM+
- Manufactured and assembled the fairings by using a CNC Router and fabricating carbon fiber molds

Wooldridge Combustion Laboratory at University of Michigan

UROP Independent Study and Summer Intern - <MATLAB, Excel, CAD, Technical Writing>

Ann Arbor, MI

Sept 2021-Jul 2022

- Collected gas samples from local landfills and utilized GC-MS to measure the siloxanes concentrations, a factor impeding landfill gas-to-energy conversion; conducted data analysis with MATLAB and Excel
- Co-authoring methods of absorption for siloxanes and repurposing siloxanes
- Delivered weekly research updates to a team of Ph.D. students and the PI; presented findings at the UROP Annual Research Symposium
- Assisted in projects involving hydrothermal liquefaction, gasification, and carbonization of waste biomasses by constructing and conducting experiments
- Designed air-assisted flare piping systems for experiments using SOLIDWORKS

SKILLS AND INTERESTS

Skills: CAD, CATIA, Creo Parametric, SOLIDWORKS, FEA, CFD, Star-CCM+, Arduino, Python, MATLAB, C++, Mill, Lathe, CNC Router, 3D Printing, Water Jetting, Laser Cutting, TIG Welding, Spot Welding, Soldering, GC-MS, LC-MS, Teamwork, Presenting, Problem Solving, Technical Writing, Microsoft - Word, Excel, and PowerPoint

Interests: Weightlifting, wildlife photography, ultimate frisbee, skiing, DJing, violin