Jeremiah Roach

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EDUCATION

Stanford University

Bachelor of Science - Mechanical Engineering — *Anticipated Graduation June 2026*

Overall GPA: 3.79 / 4.0 **Mechanical Engineering Requirements GPA**: 4.0 / 4.0

Extracurricular Activities: Stanford Space Initiative, Stanford Flight Club, Club Brazilian Jiu Jitsu and Boxing, Jazz Combo (guitar)

EXPERIENCE

Fluid Dynamics ML Researcher — *Palo Alto, CA*

Stanford University, Iaccarino Lab — *June - Sep 2024*

- Reduced simulation times of fluid dynamics models by 96% by training and deploying variational autoencoder ML models, documented with technical reports
- Increased model accuracy by 22% by translating latent space into interpreted variables

Computational Fluid Dynamics Researcher — *South Bend, IN*

Computational Mechanics and Optimization Laboratory, University of Notre Dame — *June - Sep 2023*

- Simulated newtonian fluid flow over moving and deforming domains using an Arbitrary Lagrangian Eulerian formulation of the Navier Stokes equations while optimizing for computational efficiency
- Coordinated finite element analysis program written in Julia in team-based environment

Laborer

Noodles and Company — *Mishawaka, IN*

- Multitasked time sensitive responsibilities in high paced environment while studying full time — *July 2020 - Aug 2022*

Laborer

2C Construction — *Niles, MI*

- Worked 60 hour weeks doing outdoor physical labor using heavy machinery and hand tools — *June 2021 - Sep 2021*

PROJECTS | *portfolio at jeremiahroach.com*

5 inch Quadcopter Drone — *Sep 2024 - Present*

solo project

- Prototyped and developed CAD for laser cuttable drone frame
- Developed and sourced parts for a 5 inch quadcopter drone estimating power draw, lift, run time, and other aircraft performance analyses using hand calculations and code

Mechanical Clock — *May - June 2023*

solo product design project

- Prototyped mechanics of clock mechanism using hand calculations
- Developed CAD file for mechanical clock utilizing design for manufacturing, design for assembly, and tolerancing techniques to track time to an accuracy of +/- 30 seconds an hour
- Machined all clock internals from CAD files using laser cutters and 3d printers

H Motor Solid Propellant Rocket — *April - May 2023*

Stanford Space Initiative project

- Estimated center of pressure, center of gravity, and expected apogee using simulations and hand calculations
- Assembled, launched, and successfully recovered personal H motor rocket

Electric Guitar — *May - June 2023*

solo project

- Created CAD and laser cut electric guitar body cutting template
- Planed, glued, cut, and routed out guitar body using rough sawn lumber from reclaimed wood
- Soldered, sanded, and finished guitar body and electronics with hand sprayed nitrocellulose lacquer

SKILLS

- Software Skills: Fusion 360, Ansys, FEA, CFD, Arduino, Python, Julia, C++, Matlab, Visual Basic, Microsoft Suite, Github
- Physical Skills: TIG welding, 3d printing, Soldering, Laser Cutter, Plasma Cutter, Lathe, Mill, Power Tools, Plastic and Metal Manufacturing

HONORS

- Penn High School Valedictorian — *2022*
- National Merit Finalist — *2022*
- 1st place in US of TSA TEAMS competition, team captain *(Tests of Engineering Aptitude, Mathematics, and Science)* — *2021*