

# Josh Gregory

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## EDUCATION

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### University of Colorado Boulder

Boulder, CO

M.S., Mechanical Engineering

Thesis advisor: Dr. Debanjan Mukherjee

GPA: 4.0

Expected May 2025

### University of Colorado Boulder

B.S., Mechanical Engineering, Concentrations in Computer Science and Biomedical Engineering

Cumulative GPA: 3.73

May 2024

## TECHNICAL SKILLS

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**Software:** Python, Java, MATLAB, R, LaTeX, Inventor, SolidWorks, NX, Fusion 360, 3DS Max, Blender, Star CCM+, OpenFOAM, Wolfram Mathematica, SageMath, SimVascular, XFLR5, OpenRocket, Bash, Slurm, Linux

**Libraries:** PyTorch, TensorFlow, Keras, Scikit-Learn, fastai, Pandas, NumPy, Matplotlib, SciPy, SymPy, OpenCV

**Foreign Languages:** Mandarin Chinese (Limited Working Proficiency)

## EXPERIENCE

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### Senior Design Project—Children's Hospital Colorado

August 2023 – Present

Systems and Test Engineer

Boulder, CO

- Worked alongside a pediatric surgeon to design a miniaturized surgical port for use in infant and neonatal laparoscopic surgery.
- Translated the surgeon's requirements into engineering-specific requirements for the team.
- Led investigations of material selection and manufacturing processes, specifically 3D printing with FormLabs SLA printers.
- Created and executed test plans to characterize the operating window of our port designs during laparoscopic procedures.
- **Provisional patent 63/634162** filed in April 2024.

### Biofluidics Research Group (CU Boulder)

August 2022 – Present

Research Assistant and Software Developer

Boulder, CO

- One of two core developers writing Python codebase to model and simulate blood clots from intravital microscopy images using image processing (OpenCV).
- Performed computational fluid dynamics (CFD) analysis on CU's compute cluster using knowledge of Linux, Slurm, and bash scripting.
- Developed code to optimize vision processing parameters to improve simulation accuracy.

### National Renewable Energy Laboratory (NREL) Internship

June 2023 – August 2023

Science Undergraduate Laboratory Internship (SULI) Intern

Golden, CO

- Performed fundamental materials science research to additively manufacture heat exchangers with microencapsulated phase-change materials.
- Designed and 3D-printed test articles to assess their thermodynamic and heat transfer characteristics.
- Used thermal characterization techniques (differential scanning calorimeter, thermogravimetric analysis) to analyze heat exchanger performance.

### Sounding Rocket Laboratory (CU Boulder)

July 2021 – July 2022

Liquid Engine Development Sub-team

Boulder, CO

- Created in-depth documentation to make computational fluid dynamics (CFD) decisions more repeatable and informed, allowing for full utilization of CFD tools.
- Used Siemens Star CCM+ CFD suite to investigate multi-phase flow throughout the rocket injector.
- Ran multi-phase simulations of the rocket injector to increase simulation accuracy and validate injector design.

### High-Altitude Liquid Engine (Oregon State University)

September 2019 – June 2021

Nozzle and Combustion Sub-teams

Corvallis, OR

- Used Siemens Star CCM+ to simulate multi-phase flow throughout a rocket nozzle system.
- Investigated the mathematical models behind CFD to increase the accuracy and validity of the team's analyses.
- Used Oregon State University's high-performance computing cluster to perform advanced simulations.