Haobo Zhao

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EDUCATION

Johns Hopkins University, Baltimore, MD *Sep. 2023 - Present*
Master in Mechanical Engineering
GPA: 3.86/4
Advisor: Dr. Rajat Mittal and Dr. Jung-Hee Seo

Southern Illinois University, Carbondale, IL, U.S. *2022-2023*
Aviation Technologies (Dual Degree Program with SAU)
GPA: 4.0/4.0
Dean's list: Spring 2022, Fall 2022
Magna cum Laude

Shenyang Aerospace University, Shenyang, Liaoning, China *2019-2023*
Aircraft Propulsion Engineering
GPA: 3.8/4.0
National Scholarship (2021, top 1% in Department)
SAU First Class Scholarship (Fall 2020, Fall 2021, Spring 2022)

MAJOR HONORS AND AWARDS

- **National Scholarship (2021)**: Top 1% in Department (Academic Performance).
- **First Prize of National Mathematics Competition (China, 2020)**: Top 8%
- **Third Prize of Mechanics Competition of Zhou Peiyuan(China, 2021)**
- **Top 5 in China of iCAN Innovation Contest (2021)**: 5/3000 in China, AI video surveillance clarity process

RESEARCH INTERESTS

Fluid dynamics, applied mechanics, computational fluid dynamics, multiphase flows, biological flows, immersed boundary methods, multi-physics modeling

RESEARCH EXPERIENCE

- **Johns Hopkins University** *Sep. 2023 - Present*
  Master Thesis (Advisor: Dr. Rajat Mittal, Dr. Jung-Hee Seo) – Department of Mechanical Engineering

  - Developed an imaging data-based computational model of pancreatic duct (PD) using CFX solver, validated against clinical data.
  - Built a pipeline for generating patient-specific PD models using cine-MRI data.
  - Formulated a theoretical flow model to predict pressure variations along the PD.
  - Simulated the mechanism of PD flow, correlating pressure drop with ERCP-related pain score.
  - Integrated computational models with clinical insights for potential diagnostic applications.

- **Shenyang Aerospace University** *Sep. 2021 - Dec. 2021*
  Project: Oil Tank Movement Simulation (Advisor: Dr. Wei Sha) – Department of Aerospace Engineering
  - Conducted CFD simulations to analyze oil-gas mixture behavior in a moving tank under various flight conditions.
  - Analyzed the impact of flight maneuvers on fluid stability, contributing to safety assessments.

- **Southern Illinois University** *Jan. 2022 - May. 2022*
  Urban UAV System – School of Aviation
  - Designed a truck-based UAS network for extended range through mid-route cargo exchange and power replenishment.
  - Developed a modular platform for universal UAS takeoff, landing, and maintenance.
  - Implemented dynamic route planning to optimize UAS operations and logistics.

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VOLUNTEERING

Core Team Member *Mar. 2016 - Apr. 2017*
Institute Counseling Service, IIT Kanpur

- Part of 10-member team responsible for campus-wide counseling service activities.
- Negotiated with banks to raise 150k INR in scholarships for needy students.
- Led a team of 137 student guides during 6-day long orientation program for freshers with a budget of 450k INR.
- Worked with professional counselors to aid in providing emotional, mental, and financial support to students.
- Hosted sessions aimed at providing academic or career help to students.

Assisting my PhD advisor with writing funding grants, submitting annual project reports, and peer-reviewing manuscripts in the field of modeling flow inside the stomach and the intestines.

MENTORING

- **Masters Research**: Weixuan Li, Johns Hopkins University *2023 - Present*
- **Undergraduate Research**: Aditi Gupta, Johns Hopkins University *May 2023 - Jul. 2023*

TEACHING EXPERIENCE

Teaching Assistant at Shenyang Aerospace University:

- Calculaus I, Fall 2018
- Turbulent Flow, Spring 2019