

Haobo Zhao

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EDUCATION

Johns Hopkins University, Baltimore, MD

Sep. 2023 - Present

Master in Mechanical Engineering

GPA: 3.86/4.0

Advisor: Dr. Rajat Mittal and Dr. Jung-Hee Seo

Relevant Courses: CFD, Fluid Dynamics I & II, Numerical Methods

Southern Illinois University, Carbondale, IL

2022-2023

Aviation Technologies (Dual Degree Program with SAU)

GPA: 4.0/4.0

Dean's List: Spring 2022, Fall 2022

Graduated Magna cum Laude

Shenyang Aerospace University, Shenyang, China

2019-2023

Bachelor in 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)**: Awarded to top 1% in department for academic excellence.
- **First Prize, National Mathematics Competition (China, 2020)**: Top 8% of participants.
- **Third Prize, Mechanics Competition of Zhou Peiyuan (China, 2021)**: Recognized for excellence in mechanics.
- **Top 5 in China, iCAN Innovation Contest (2021)**: Ranked 5th out of 3000 teams nationally (Group Award).

RESEARCH INTERESTS

Computational Fluid Dynamics (CFD), 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 the pancreatic duct (PD) using the 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 PD flow mechanisms, correlating pressure drop with ERCP-related pain scores.
 - Collaborated with a medical group led by Dr. Venkata Akshintala and Dr. Ibadat Singh Boparai.
 - 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 (Advisor: Thomas Roy) – Department of Aviation Technologies
 - 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.

VOLUNTEERING & TEACHING

Core Team Member *May 2022 - Dec. 2022*
 SIU-SAU University Collaboration Program Student Helper

- Provided counseling for students from Shenyang Aerospace University (SAU) in the SIU-SAU Collaboration program.
- Negotiated with the Southern Illinois University (SIU) Center for International Education for course arrangements.
- Worked with professional counselors to provide emotional, mental, and financial support to students.

SAU Student Study Helper *Dec. 2019 - Dec. 2021*
 Student Teacher, Shenyang Aerospace University

- Provided tutoring and guidance for Calculus I & II and College Physics I, including study sessions and final exam reviews.
- Assisted 66 students from the classes of 2023 and 2024, improving their understanding and performance.
- Collaborated with lecturers to enhance lecture quality and student comprehension.

- Developed final review materials, including mind maps and instructional videos to aid in retention. link: [Mind Maps] link: [Videos]

HONORS AND AWARDS

Mathematics:

- First Prize, National Mathematics Competition for College Students (Top 8%), 2020
- First Prize, Mathematical Modeling Competition in Liaoning Province, 2021
- Second Prize, Mathematical Modeling Competition in Liaoning Province, 2020
- Second Prize, National Mathematics Competition for College Students, 2021
- Third Prize, China CUMCM (Contemporary Undergraduate Mathematical Contest in Modeling), 2021
- Third Prize, MathorCup Undergraduate Mathematical Modeling Challenge, 2021
- Second Prize, Asia Pacific Mathematical Contest in Modeling, 2020
- Second Prize, Mathematical Contest in Modeling of Three Provinces in Northeast China, 2020

Physics:

- Third Prize, Mechanics Competition in Honour of Zhou Peiyuan, 2021
- First Prize, Physics Experiment Competition in Liaoning Province, 2020

Innovation and Design:

- iCAN Innovation Contest (Finalist), Top 5 in China, 2021
- Third Prize, China College Students' "Internet+" Innovation and Entrepreneurship Competition, 2021
- Second Prize, The 6th China International "Internet+" College Student Innovation and Entrepreneurship Competition SAU Selection, 2020
- First Prize, SAU Future Engine Design Competition