

Haobo Zhao

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Education

Johns Hopkins University , Baltimore, MD	Sep. 2023 - Present
<ul style="list-style-type: none">• <i>Master in Mechanical Engineering</i>• Advisors: Dr. Rajat Mittal and Dr. Jung-Hee Seo• Coursework: CFD, Fluid Dynamics I & II, Convection, Numerical Method, Turbulence, Multiphase Flow	GPA: 3.86/4.0
Southern Illinois University , Carbondale, IL	2022 - 2023
<ul style="list-style-type: none">• <i>B.S. in Aviation Technologies</i> (Dual Degree with SAU)• Graduated Magna cum Laude, Dean's List: Fall 2022, Fall 2023	GPA: 3.81/4.0
Shenyang Aerospace University , Shenyang, China	2019 - 2023
<ul style="list-style-type: none">• <i>Bachelor in Aircraft Propulsion Engineering</i>• National Scholarship (2021, top 1% in Department)• SAU First Class Scholarship (Fall 2020, Fall 2021, Spring 2022)	GPA: 3.8/4.0

Research

Johns Hopkins University , Baltimore, MD	Jan. 2024 - Present
<ul style="list-style-type: none">• Master Thesis (Advisor: Dr. Rajat Mittal, Dr. Jung-Hee Seo) – Department of Mechanical Engineering• Developed an imaging data-based CFD model of the pancreatic duct (PD) using the CFX solver, validated against clinical data. Simulated PD flow mechanisms and correlated pressure drop with ERCP-related pain scores.• Created a procedure for generating patient-specific PD models using cine-MRI data.• Formulated a theoretical flow model to predict pressure variations along the PD.• Collaborated with medical teams to validate the results for clinical applications.	

Publications and Presentations

Conference Presentations

- Zhao, H., Seo, J. H., Akshintala, V., Boparai, I., & Mittal, R. (2024). Computational Modeling of Pancreatic Duct Flows for a Novel Non-invasive Diagnosis of Chronic Pancreatitis. *Bulletin of the American Physical Society*.

In Preparation

- Zhao, H., Seo, J. H., Akshintala, V., Boparai, I., & Mittal, R. (2024). **Non-invasive assessment of pancreatic duct hypertension using computational flow modeling**. (To be submitted to the *Journal of Biomechanical Engineering*).

Experience

CFD Visualization Engineer , CertAir LLC	Oct. 2024 - Present
<ul style="list-style-type: none">• Conducted CFD simulations of cleanroom airflow to optimize layout and design for controlled environments.• Developed and implemented visualization techniques for airflow patterns and pressure distribution to diagnose cleanroom performance issues.• Automated processes for robotic pressure measurement, particle detection, and report generation, streamlining cleanroom certification workflows.• Collaborated with multidisciplinary teams to enhance cleanroom compliance with ISO standards and improve operational efficiency.	

Skills

Programming: Python, MATLAB, C++

Software: ANSYS CFX, Fluent, COMSOL, Mimics, 3-Matic, Blender, AutoCAD, SOLIDWORKS

Tools: Git, \LaTeX

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).

Volunteering & Teaching

Student Teacher, Shenyang Aerospace University Dec. 2019 - Dec. 2021

- Tutored Calculus I & II and College Physics I, including study sessions and final exam reviews.
- Assisted 66 students, improving understanding and academic performance.
- Created final review materials, including mind maps and instructional videos to aid retention.

Core Team Member, SIU-SAU University Collaboration Program May 2022 - Dec. 2022

- Counseled students from Shenyang Aerospace University in the SIU-SAU Collaboration program.
- Negotiated with SIU's Center for International Education for course arrangements.
- Provided emotional, mental, and financial support in collaboration with professional counselors.

Other Rewards

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