
Haobo Zhao

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Education

Johns Hopkins University, Baltimore, MD

Sep. 2023 - Present

Master in Mechanical Engineering

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

Relevant Coursework: CFD, Fluid Dynamics I & II, Convection, Numerical Method, Turbulence, Multiphase Flow

Southern Illinois University, Carbondale, IL

2022-2023

B.S. in Aviation Technologies (Dual Degree with SAU)

GPA: 3.81/4.0

Graduated Magna cum Laude, Dean's List: Fall 2022, Fall 2023

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)

Research Interests

I am interested in the simulation and application of bio-fluids in various aspects. I have experience in coordinating with medical teams to solve real problems in patients using CFD, as well as experience in flow simulation and analysis in bio-ducts and algorithm development.

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.

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 CFD model of the pancreatic duct (PD) using the CFX solver, validated against clinical data.
- Created a pipeline 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.
- Simulated PD flow mechanisms and correlated pressure drop with ERCP-related pain scores.

Honors and Awards

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- **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).

Technical Skills

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- **Programming:** Python, MATLAB, C++
 - **Software:** ANSYS CFX, ANSYS Fluent, COMSOL, OpenFOAM, SolidWorks
 - **Tools:** Git, LaTeX

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

May 2022 - Dec. 2022

SIU-SAUI University Collaboration Program Student Helper

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- 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.