Weixuan Li

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EDUCATION

Johns Hopkins University (JHU), USA   **Sept. 2023 – Present**

Master of Science in Engineering (Expected), Dept. of Mechanical Engineering
- Cumulative GPA: 4.0/4.0; TOEFL: 113/120

Massachusetts Institute of Technology (MIT), USA   **Sept. 2022 – May 2023**

MIT-SUSTech special student program (Non-degree), Dept. of Mechanical Engineering
- Cumulative GPA: 5.0/5.0

Southern University of Science and Technology (SUSTech), China   **Sept. 2019 – June 2023**

Bachelor of Science, Theoretical and Applied Mechanics, Dept. of Mechanical and Aerospace Engineering
- Cumulative GPA: 3.86/4.0; Class Rank: 1/21

PUBLICATIONS

[1] **W. Li**, S. Kuhar, J.H. Seo, R. Mittal. "Food Digestion in the Stomach after Bariatric Surgery: Insights from Multiphase Flow Modeling." *APS Division of Fluid Dynamics Meeting Abstracts*, 2024 (**Accepted**).

[2] Krinos, A.I., Shapiro, S.K., **Li, W.**, Haley, S.T., Dyhrman, S.T., Dutkiewicz, S., Follows, M.J., and Alexander, H. (2024). "Intraspecific diversity in thermal performance determines phytoplankton ecological niche." *bioRxiv*, 2024-02. Also submitted to *Ecology Letters* (Under review).

RESEARCH EXPERIENCE

Large eddy simulation (LES) in Lattice Boltzmann method for turbulent channel flow   **Sept. 2021 - May 2023**

*Wang's Research Group, supervised by Prof. **Lian-Ping Wang***   ***SUSTech**, Shenzhen, China*
- Conducted advanced theoretical analysis and applications of LES-LBM for turbulent flows, with a focus on insights from "Large Eddy Simulation for Incompressible Flows" by Pierre Sagaut.
- Developed and implemented FORTRAN90 codes to integrate the Smagorinsky subgrid-scale model and the Musker wall model into a custom numerical simulation package using Linux, enhancing its efficiency while maintaining accuracy in simulating turbulent channel flows.
- Awarded the Excellent Undergraduate Thesis Award at SUSTech.
- Secured funding of RMB 10,000 ($1,500) for this project from the National Innovation and Entrepreneurship Training Program for College Students.

Thermal Niche Modeling and Bioinformatics of Marine Phytoplankton   **Sept. 2022 - May 2023**

*Mick Follow's Group, supervised by Prof. **Mick Follows***   ***MIT**, Cambridge, MA, USA*
- Co-authored a manuscript submitted to Ecology Letters, currently under peer review, where I contributed as the third author.
- Conducted literature reviews on marine ecosystem modeling, focusing on the interactive effects of environmental factors such as temperature on marine phytoplankton, particularly coccolithophores.
- Analyzed Darwin ecosystem model outputs to visualize and interpret the thermal range variations of different Gephyrocapsa huxleyi strains across global ocean regions using Julia.
- Led the creation of Figure 4 (panels B-F) in the manuscript, which involved probabilistic modeling and projection of the environmental distributions of Gephyrocapsa huxleyi strains based on thermal response data.

Computational Modeling of Stomach Surgery Using Multiphase Flow Simulations   **Sept. 2023 - Present**

*Flow Physics and Computation Lab, supervised by Prof. **Rajat Mittal***   ***JHU**, Baltimore, MD, USA*
- **Project 1:** Food Digestion in the Stomach after Bariatric Surgery: **Jan. 2024 - Present**
   Insights from Multiphase Flow Modeling

- The abstract based on this project has been accepted for presentation at the APS Division of Fluid Dynamics Meeting (2024).
- Investigated the impact of laparoscopic sleeve gastrectomy, a type of bariatric surgery that alters stomach geometry and gastric motility, on digestion inside the stomach.
- Developed a modified stomach model to reflect post-surgical conditions by resecting a portion of the stomach and altering its contraction pattern from bilateral to unilateral due to the non-contracting resected side.
- Conducted multiphase flow simulations on the modified stomach model and compared the results with those of the stomach before sleeve gastrectomy.
- Quantified the effects of sleeve gastrectomy on the transport, mixing and emptying functions of the stomach.

Project 2: Vicar3D Code Validation with Multiphase Flow Simulations · · · · · · **Sept. 2023 - Dec. 2023**

- Utilized Vicar3D, a custom code package developed within the research group for simulating multiphase flows, to validate its performance against established benchmarks.
- Conducted literature reviews and selected a relevant study titled *Simulation of the falling droplet by the lattice Boltzmann method"* to benchmark the Vicar3D code.
- Reproduced the 2D falling droplet simulations from the study, and the results from Vicar3D align well with the literature at specific time points, validating the accuracy and reliability of the Vicar3D code.

AWARDS AND FELLOWSHIPS

Johns Hopkins Mechanical Engineering Distinguished Master's Fellowship · · · · · · **Aug. 2023**

- Selected as one of the most excellent master's students to receive the fellowship (only 3-4 students each year), which provides 50% tuition coverage during the master's program.

Thomas Sheridan Award | *MIT Department of Mechanical Engineering Student Award* · · · · · · **May 2023**

- Distinguished as one of a select group of undergraduate and graduate students recognized for outstanding achievements.

Excellent Graduate for Exceptional Performance · · · · · · **June 2023**

- Honored as the top graduate among all undergraduates at SUSTech.

Excellent Undergraduate Thesis Award · · · · · · **June 2023**

- Recognized for the outstanding undergraduate thesis at SUSTech titled "Large-eddy Simulation with Wall Model in Lattice Boltzmann Method for Turbulent Channel Flow".

ASC22 Student Supercomputer Challenge | *Second Class Prize* · · · · · · **May 2022**

- Awarded as a member of the Southern University of Science and Technology team for outstanding performance in the world's largest supercomputing competition.

Merit Student Scholarship | *First Class* · · · · · · **Nov. 2019, 2020, 2021**

- Awarded to the top 5% of undergraduate students for exceptional academic performance.

TECHNICAL SKILLS

Programming Languages: Fortran90, Python, Java, Julia
Software and Tools: Paraview, Tecplot, MATLAB, COMSOL, ANASYS, Solidworks, Blender, Linux, High-Performance Computing (HPC) systems

WORK EXPERIENCE

Teaching Assistant, Statistical Learning for Engineers · · · · · · **Sept. 2024 – Present**

- Selected as a TA based on outstanding performance in the course.
- Working on grading homework assignments, exams, and projects, holding office hours, and managing *Piazza*.

Student Assistant, SUSTech · · · · · · **Sept. 2019 – May 2020**

- Organized meetings for tutor group leaders, managed college branding activities, and revised student manuals.

LEADERSHIP AND ACTIVITIES

Secretary-General of the Student Union, Shuren College, SUSTech · · · · · · **Sept. 2020 – Sept. 2021**

- Organized events, drafted documents, managed files, and coordinated with other organizations.

Vice President of the Table Tennis Club · · · · · · **Sept. 2020 – Sept. 2021**

- Authored publicity articles, supported the President in organizing events, and contributed to the club's recognition as one of the annual top 10 clubs in the university.

Volunteer Instructor, STEAM+ Team · · · · · · **Sept. 2019 – Dec. 2019**

- Taught primary students in the community to use 3D printers through volunteer classes.
- Contributed to the project being recognized as the "Annual Outstanding Public Welfare Project" by the SUSTech Volunteer Association.