# Baiming Zhang

Homepage: baiming-zhang.github.io
Email: baimingzhang@zju.edu.cn

## Summary

I am a senior undergraduate in Engineering Mechanics at Zhejiang University, working under the guidance of Prof. Shiying Xiong. My research lies at the intersection of scientific machine learning and scientific computing, focusing on neural operators and computational methods for PDEs, with applications to fluid systems, Schrödinger-type models, and reduced-order modeling.

## Education

- **Zhejiang University, Engineering Mechanics** **Sep 2023 – Jun 2027 (expected)**
  B.Eng. Candidate, GPA: 90.2/100, Rank: 1/55
- **University of British Columbia** **Oct 2026 – Jan 2027 (expected)**
  Visiting International Research Student

## Publications and Preprints

- **Baiming Zhang**, Shiying Xiong, and Zhecheng Wang* (2026). Neural Eigenfluid Bases: Spectral Objectives, Gauge, and Topology. *arXiv preprint*, arXiv:2610.33925.
- **Baiming Zhang**, Jinsong Tang*, Ying Xu*, Lihua Chen, and Shiying Xiong (2026). Local Gradient Neural Operator. *arXiv preprint*, arXiv:2609.07752.
- Zituo Chen, **Baiming Zhang**, and Sili Deng* (2026). Learnable Composition for Neural Operators. *NeurIPS 2026 Workshop on AI for Science*.

## Research Experience

- **Physics-Guided Learning for Simulation** **Oct 2026 – Present**
  Advisors: Prof. Peter Yichen Chen and Dr. Mengdi Wang, PhysAI Lab, University of British Columbia.

  Leading research on geometry-generalizable neural operators for physical simulation, including parametric dataset generation, model development, and systematic evaluation across unseen geometries and boundary conditions. Also contributed to the Agent Contact project by exploring weather and meteorological applications.
- **Learnable Composition for Neural Operators** **Aug 2026 - Present**
  Advisors: Zituo Chen and Prof. Sili Deng, Deng Energy and Nanotechnology Group (DENG), Massachusetts Institute of Technology (MIT).

  Collaborated remotely during my visiting research at University of British Columbia, conducting literature reviews, performing extended numerical experiments to evaluate generalization capabilities, and contributing to manuscript proofreading and revision.
- **Geometry-Conditioned Reduced-Order Fluid Modeling** **Jun 2026 – Sep 2026**
  Advisors: Zhecheng Wang and Prof. Eitan Grinspun, Dynamic Graphics Project (DGP), University of Toronto.

  Led the development of geometry-conditioned neural representations for reduced-order incompressible fluid simulation, focusing on physically constrained representations and efficient fluid dynamics modeling.

- **Machine Learning in Fluid and PDE Systems** **Jan 2025 – Present**
  Advisor: Prof. Shiying Xiong, Institute of Fluid Engineering, Zhejiang University.
  Led the development of a lightweight local-gradient neural operator for PDE learning, including model design, implementation, and numerical evaluation. Also advanced Hamiltonian-based incompressible Schrödinger flow research through numerical experiments and visualization.

- **Quantum States & Devices Research** **Oct 2023 – Dec 2024**
  Advisors: Prof. Dawei Wang and Prof. Xingqi Xu, Zhejiang Key Laboratory of Micro-Nano Quantum Chips and Quantum Control, Zhejiang University.
  Participated in experimental quantum optics research, investigating laser frequency stabilization, performing laser calibration, and conducting Raman spectroscopy experiments. Contributed related findings to research competitions and academic presentations.

## Selected Awards and Honors

- **International College Student Engineering Mechanics Competition**, **World Gold Medal**, 2025
  *First student in ZJU-SAA history to win the gold medal.*
- Chinese National Zhou Peiyuan Mechanics Competition, First Prize, 2025
- Mechanics "101 Plan" Academic Forum, Outstanding Oral Presentation, 2026
- China Aerospace Scholarship, 2025
- Chu Kochen Honors College Scholarship for Outstanding Students, 2025
- Zhejiang Provincial Government Scholarship, 2024-2026
- Mathematics Competition for College Students, First Prize, 2023

## Other Experience

- Teaching Assistant, Chinese Physics Olympiad Training Camp, 2024
- Awarded "Five-Star Volunteer" — the university's highest honor for public service
- Volunteer Coordinator, 2024 International Symposium on Quantum Computing and Quantum Optics

## Technical Skills

- **Programming & Scientific Computing**: Python, MATLAB, CUDA, LaTeX, C++
- **Tools**: ANSYS Fluent, Houdini, Blender, SolidWorks, AutoCAD, Tecplot, Raspberry Pi
- **Machine Tools**: Lathe, milling machine, shaper, slotter