

# Baiming Zhang

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## Summary

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- I'm a junior undergraduate majoring in Engineering Mechanics at Zhejiang University, working under the supervision of Shiying Xiong. My research interests lie in computer graphics, computational physics, scientific machine learning in PDE solving, and nueral networks in solving ISF equations. I have also dabbled in quantum simulation and atomic physics.
- My core work revolves around crafting geometric representations and discrete numerical methods that make hard, system-level physics problems computationally tractable. What keeps me hooked is the ever-changing choreography of fluids—how their vortex filaments fold and merge, how coherent swirls blossom and break apart, and how the gross-scale connectivity of the flow re-wires itself in time.

## Education

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- **Level of education** **Sep 2023 - Present**  
Zhejiang University  
Engineering Mechanics (Chu Kochen Honors College)  
GPA: 3.93/4.0 | Ranking: 3/52

## Paper

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- **Spatial differential inspired neural operator (SDINO)** Drafting, Primary author
- **Neural Network learning of Incompressible Schrödinger Flows** Drafting, Second author

## Experience

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- **Quantum States & Devices Research Group** **Oct 2023 – Dec 2024**  
Under Prof. Dawei Wang & Dr. Xingqi Xu  
Rydberg atoms, 4D Quantum Hall Effect, Raman, Fock states, SERF, EIT
- **Fluid Mechanics & Quantum Computing Lab** **Jan 2025 – Apr 2025**  
Under Mentor Shiying Xiong
- **Houdini Visualization Studio** **Aug 2025 – Oct 2025**  
Particle, Fluid, Smoke, Cloth FX
- **Machine Learning & Exploration** **Apr 2025 – Present**  
Learning PINN, HNN, Taylor-Net → Building SDINO

## Selected Awards and Honors

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- **International College Student Engineering Mechanics Competition**  
**World Gold Medal (Top 0.1%)**  
*First student in ZJU-SAA history to win the gold; featured on the school homepage.*

- Chinese National Zhou Peiyuan Mechanics Competition — First Prize (Top 1%)
- International Young Physicists' Tournament (ZJU Selection) — Champion (Top 1)
- Government Scholarship (Top 5%)
- National Intelligent-Vehicle Competition for College Students — First Prize (Full Score, Top 5%)
- Mathematics Competition for College Students — First Prize (Top 10%)

## Teaching Experience

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- Teaching Assistant, CPhO Training Camp — tutored top high-school students (More than 1000 in total) for the Chinese Physics Olympiad finals, guiding 30+ students to gold medals and 50+ to admission at Tsinghua and Peking Universities.

## Technologies

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- **Languages**  
Python, MATLAB, HTML, LaTeX, etc.
- **Platform**  
PyTorch, Github, Houdini, Solidworks, Raspberry Pi, etc.
- **Machine Tools**  
Lathe, Milling machine, Shaper, Slotter, etc.

## Other Project Experience

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- **AI-Driven Omnidirectional Logistics Rover** 2023  
Conceived full-cycle digital twin in SolidWorks, 3D printed and precision-assembled an autonomous rover equipped with 6-DOF compliant manipulator and multi-sensor SLAM; achieves sub-centimeter pick-and-place accuracy in dynamic warehouse scenarios.
- **High-Sensitivity Raman Spectroscopy Survey** 2024  
Surveyed anti-Stokes, CARS, SRS and other Raman enhancement routes for IYPT, benchmarking their ppm-level detection limits and “within-second” molecular-fingerprint tracing setups.
- **Air-Ground Heterogeneous Swarm Collaboration** 2024  
Devised a ROS-centric distributed-control framework synchronizing UAVs and UGVs; deep-vision-based perception enables real-time object localization, cooperative grasping and mission-level task handoff in GPS-denied environments.
- **MCM/ICM – Staircase Age-Inversion Model** 2024  
Proposed a physics-statistics hybrid algorithm that retrodicts construction year of staircases solely from 3D wear topography, reducing infrastructure-age estimation error from decades to less than 5 years and offering a low-cost paradigm for urban asset management.

## Selected Community Services

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- Awarded “Five-Star Volunteer” — the university’s highest honor for public service.
- Served as volunteer coordinator for the 2024 International Symposium on Quantum Computing and Quantum Optics, which broadened my global perspective and forged valuable international connections.
- 350+ hours as a 3D-printing volunteer at Zhejiang University IBE (Innovation-based Entrepreneurship), guiding student teams from prototype design to fabrication.
- 50+ hours elderly-care volunteer – companionship and wellness activities at local nursing home.

## Declaration

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- I hereby declare that the above mentioned information is correct up to my knowledge and I bear the responsibility for the correctness of the above mentioned.