Zhixuan Zhao(赵之煊)

Undergraduate Student, Xingjian College, Tsinghua University

Email zz0487@princeton.edu zhixuan-24@mails.tsinghua.edu.cn
Phone +1 (609) 255-6545 +86 186 1157 6200
Web https://fourierlaplace124-design.github.io/

Education

Tsinghua University Beijing, China 2024–2028 (expected)
Dual Bachelor's Degree Program in **Mechanics** and **Advanced Clean Energy Program** (Under CCE, Department of Energy and Power Engineering), Xingjian College

GPA: 3.6/4.0

Princeton University Princeton, NJ, USA Jan–May 2026
Department of Mechanical and Aerospace Engineering (MAE); Exchange Student

Selected Coursework: *Numerical Algorithms for Scientific Computing (graduate-level); Mathematical Analysis; Advanced Algebra; Ordinary Differential Equations (ODEs); Partial Differential Equations (PDEs); Engineering Thermodynamics; Heat Transfer; Fluid Mechanics; Optimization; Complex Analysis.*

Research Interests

ML for inverse problem and sparse reconstruction; ML-driven methods for numerical computation and physical field simulation; multiphysics. Additional interests include embodied intelligence and robotics.

Publications & Preprints

Zhixuan Zhao, Tao Zhong, Yixun Hu, Nathalie P. de Leon, and Christine Allen-Blanchette.
Neural Fields for NV-Center Inverse Sensing.
Preprint, 2026. arXiv:2605.13988. Submitted to ICLR 2027. Project website.

Yaojun Li, **Zhixuan Zhao**, Dongzhe Zheng, and Christine Allen-Blanchette.
Low-Rank Clebsch–Gordan Coupling for Equivariant Spherical Forecasting.
Preprint, 2026. arXiv:2611.03411. Submitted to ICLR 2027.

Yixun Hu, **Zhixuan Zhao**, Tao Zhong, and Christine Allen-Blanchette.
OrbitRIR: Frame-Averaged Few-Shot RIR Synthesis for 3D Sound Source Localization.
Accepted to the *Embodied Spatial Reasoning Workshop at NeurIPS 2026 (Paper Track)*.
Project PDF will be released soon.

Conference Presentations

ASME IDETC-CIE 2026

Aug 23–26, 2026; Houston, TX, USA
Closed-Form Force Design for Friction Reduction in an Eccentrically Loaded Nonlinear Drawer Dynamic System.
Technical Presentation; extended abstract; co-first author.

Research Experience

CAB Lab, Princeton University Feb 2026–Present
Advisor: Prof. Christine Allen-Blanchette | Mentor: Tao Zhong

- **NeTMY:** Led physical modeling and neural-field design (Feb–Jul 2026) for sparse NV-center reconstruction, studying forward-model fidelity and center-collapse mitigation; continued collaboration on equivariant models for acoustics and weather forecasting.
- **LCG-SFNO:** Collaborated with Yaojun Li to extend SFNO using Clebsch–Gordan (CG) tensor products, achieving full SO(3) equivariance and improving weather forecasting accuracy. Led the design of **SSHCG**, a CG tensor-product computation library that reduces computational overhead and model deployment costs.

- **OrbitRIR:** Collaborated with Yixun Hu to improve acoustic modeling through frame averaging and receiver-yaw invariance, increasing RIR synthesis accuracy and improving sound-source localization in unseen rooms.

Institute of Engineering Thermophysics, Tsinghua University Sep 2025–Feb 2026

Advisor: Prof. Xianghua Xu

- Developed a CNN surrogate to infer cell-wise correction coefficients from temperatures on two opposing surfaces, addressing non-orthogonal mesh errors in finite-volume heat-transfer simulations.
- Led implementation, including ANSYS mesh parsing, and benchmarked the model against least-squares-based methods on simple 3D geometries.

Technical Skills

Programming: Python, MATLAB, Fortran

Simulation: COMSOL Multiphysics, ANSYS

Languages

English: Excellent proficiency (TOEFL: 100+)