

# Bowen Shi

bowenshi@utexas.edu — (737)303-9699 — [github.com/BowerShi](https://github.com/BowerShi) — [Google Scholar](https://scholar.google.com/citations?user=bowenshi)

## EDUCATION

---

Oden Institute, University of Texas at Austin

August 2024 - Present

Ph.D. in Computational Science, Engineering, and Mathematics

School of Mathematical Sciences, Peking University

September 2020 - July 2024

Bachelor of Science, Computational Mathematics

## RESEARCH INTERESTS

---

Scientific Computing, Scientific Machine Learning and Sampling.

## PUBLICATION

---

- *Finite elements for symmetric and traceless tensors in three dimensions*, (with Kaibo Hu and Ting Lin), preprint *arXiv:2311.16077*, 2023, under review at *Mathematics of Computation*.

## RESEARCH EXPERIENCE

---

Undergraduate Researcher, Peking University

September 2022 - Present

Advisor: Prof. Jun Hu, Dr. Pengzhan Jin

- **Study of the Extended Cyclic Reduction (ECR) Algorithm**
  - Implemented the ECR algorithm for high-dimensional Poisson and Black-Scholes equations with separable coefficients. Uncovered an algebraic relationship within the coefficients of block multi-diagonal matrices.
- **Geometry-informed Deep Operator Network (DeepONet) for Large-scale PDEs on varying domains**
  - Exploring point cloud and implicit neural representation (INR) based ways to encode geometry into operator networks.

Research Assistant, University of Oxford/University of Edinburgh

March 2023 - March 2024

Advisor: Dr. Kaibo Hu

- **Finite Element Exterior Calculus, Discretization of TT tensors and the Conformal Deformation Complex**
  - Constructed a conforming finite element conformal complex on tetrahedral meshes with exactness property.
  - Established the inf-sup condition of the first stable symmetric and traceless tensor divergence pair. **Results relate to structure-preserving approximation of the transverse-traceless (TT) tensors in gravitational wave models.**

## HONORS & AWARDS

---

- **NIMS Research Fellowship**, University of Texas at Austin *August 2024*
- **Excellence Prize**, 14th S. T. Yau Contest in Applied and Computational Mathematics *June 2023*
- **First Prize in Beijing**, Chinese Mathematical Modeling Contest *October 2022*
- **PKU Elite Undergraduate Training Program for Mathematics** *Spring 2021*

## TEACHING & SEMINARS

---

- **High-Dimensional Probability, Teaching Assistant** (graduate-level course) *Fall 2023*
- **FEEC & Computational Electromagnetics Seminar, Co-organizer** *Spring 2023*
- **Advanced Mathematics C, Recitation Instructor** (undergraduate-level course) *Fall 2022*
- **Elliptic Curve Seminar, Organizer** *Spring 2022*

## SKILLS

---

- **Programming** LaTeX, Matlab, C/C++, Pytorch.
- **Language** Mandarin, English, French (Elementary).