

Zheng Tan

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📄 Google Scholar 🌐 Personal Website 🐙 GitHub

Education

University of California, Los Angeles (UCLA) Sep 2023 – Present
Ph.D. in Applied Mathematics (Expected) GPA: 3.95/4.0
Research Interests: Numerical Analysis, Generative Models in Machine Learning

University of California, Los Angeles (UCLA) Sep 2019 – Jun 2023
B.S. and M.A. in Applied Mathematics GPA: 3.99/4.0
Relevant Coursework: Numerical Analysis, Numerical Linear Algebra, Applied ODE/PDE, Fluid Dynamics, Real Analysis, Dynamical Systems, Probability and Stochastic Process.

Languages and Skills

Languages: Native Mandarin, Fluent English

Programming: Python, MATLAB, C++, Java, JavaScript, R, LaTeX

Frameworks & Tools: PyTorch, Scikit-learn, Diffuser, Git, Deep Learning, Computer Vision, Image Generation, Video Generation

Publications and Preprints

- **Z. Tan**, W. Wang, A. Bertozzi, E. Ryu. STORK: Faster Diffusion And Flow Matching Sampling By Resolving Both Stiffness And Structure-Dependence. *arXiv 2025*.
- **Z. Tan**, T. Aslam, A. Bertozzi. Explicit Monotone Stable Super-Time-Stepping Methods for Finite Time Singularities. *SIAM Journal on Applied Mathematics accepted, 2025*.
- J. Chapman, B. Chen, **Z. Tan**, J. Calder, K. Miller, A. Bertozzi. Novel Batch Active Learning Approach and Its Application on the Synthetic Aperture Radar Datasets. *Proc. SPIE 12520*, Best Student Paper Award, 2023.
- **Z. Tan**, L. Huang, Y. Lou. Non-convex approaches for low-rank tensor completion. *ICASSP 2023*.

Research Experience

Sparse-View CT Reconstruction June 2025 – Present

- Work with Los Alamos National Lab to scale up the sparse-view CT reconstruction task.
- Enable the GPU-based CT image reconstruction to an unprecedented size.

STORK Diffusion and Flow Matching Sampling Method Feb 2025 – Present

- Developed a training-free sampling method compatible with both diffusion and flow-matching models, based on super-time-stepping methods in numerical analysis.
- Achieved state-of-the-art results within all NFE range.

Numerical Simulation for PDE Singularities Feb 2024 – Present

- Applied super-time-stepping to parabolic equations with finite-time singularities.
- Proved a decade-old conjecture on numerical monotonicity.

Tensor Completion and Image Processing

Mar 2022 – Jan 2023

- Developed non-convex L1-L2 ADMM methods for low-sample settings.
- Extended CUR decomposition to tensors with resampling; improved speed 100x.

UCLA Applied Math REU: Active Learning

Jun 2022 – Aug 2022

- Enhanced SAR image classification using transfer learning and graph-based Laplacian methods.
- Designed batch active learning, improving time efficiency 15x and accuracy.

Directed Reading Program

Jan 2022 – Jun 2022

- Studied measure theory and functional analysis under a Ph.D. mentor.
- Presented on strict inductive limit topology.

Teaching Experience

UCLA Olga Radko Endowed Math Circle

Sep 2021 – Mar 2023

- Taught math to high school students (grades 9–11) on topics including combinatorics, dynamical systems, and algebra.

UCLA Department of Mathematics

Grader

Sep 2020 – Dec 2020

- Graded Linear Algebra (Math 33A); assisted with identifying knowledge gaps.

Teaching Assistant

Sep 2023 – Present

- PIC 16A (Intro to Python), Math 269A/B (Graduate Numerical Analysis), Math 151B (Applied Numerical Methods), Math 134 (Differential Equations)

Talks and Presentations

- Los Alamos National Lab, Jul 2, 2025
- UCLA PhD Advancement Talk, Jun 3, 2025

Honors and Awards

- Math Department Scholar Program (B.S./M.S. in 4 years)
- Math Department Honors Program
- 2023 Daus Memorial Award