Shaorong Zhang

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– **Github**: https://github.com/szhan311

Biographical sketch

I am a fourth-year Ph.D. student in Electrical and Computer Engineering at the University of California, Riverside, advised by Professor Greg Ver Steeg since 2024. My research interests lie in **fundamental diffusion (bridge) models, guidance and alignment**. I am also interested in solving inverse problems using diffusion priors and in applying machine learning methods to scientific domains such as brain imaging and power systems.

Education

- **University of California, Riverside**

  PhD, Electrical and Computer Engineering, GPA: 3.9/4 Sep 2022 - Present
  Major Courses: Stochastic Processes, Mathematical Methods for Electrical Engineering, Computational Learning, Optimization for Machine Learning, Information Theory, Electric Power Distribution Systems, Partial Differential Equations, etc.

- **Xi'an Jiaotong University**

  Master, Control Science and Engineering, GPA: 3.57/4 Sep 2019 - Jun 2022

  Major Courses: Mathematical Statistics, Stochastic Process, Linear System Theory, Multi-sensor Information Fusion, System Identification, Advanced Graph Theory, Big Data and Deep Learning, etc.

- **Xi'an Jiaotong University**

  Bachelor, Automation, GPA: 3.5/4 Sep 2015 - Jun 2019

  Major Courses: Mathematical Analysis, Linear Algebra and Analytic Geometry, Probability Theory and Mathematical Statistics, Data Structures and Algorithms, Signals and Systems, Operations Research, Digital Signal Processing, Computer Principle and Embeeded System Design, Digital Image and Video Processing, Pattern Recognition, Numerical Analysis and Algorithms, Introduction to Artifical Intelligence, etc.

Research Interests

- **Fundamental diffusion (bridge) models, guidance, fine tuning, alignment, solving inverse problems with diffusion priors.**
- **Medical imaging, data-driven control, optimization and decision making, physics-informed machine learning.**

Publications

1. Shaorong Zhang, Rob Brekelmans, Greg Ver Steeg, "Local MAP Sampling for Diffusion Models", under review, 2025.
2. Shaorong Zhang, Rob Brekelmans, Yunshu Wu, Greg Ver Steeg, "Measurement-Aligned Flow for Inverse Problems", under review, 2025.
3. Shaorong Zhang, Yuanbin Cheng, and Greg Ver Steeg, "Exploring the Design Space of Diffusion Bridge Models", Advances in Neural Information Processing Systems (NeurIPS), 2025.
4. Shaorong Zhang, Tamoghna Chattopadhyay, Sophia I. Thomopoulos, Jose-Luis Ambite, Paul M. Thompson, Greg Ver Steeg, "Diffusion Bridge Models for 3D Medical Image Translation", 47th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC), 2025.
5. Shaorong Zhang, Yuanbin Cheng, and Nanpeng Yu, "Generating Synthetic Net Load Data with Physics-informed Diffusion Model", IEEE Transactions on Smart Grid, 2025 .
6. Nanpeng Yu, Shaorong Zhang, Jingtao Qin, Patricia Hidalgo-Gonzalez, Roel Dobbe, Yang Liu, Anamika Dubey, Yubo Wang, John Dirkman, Haiwang Zhong, et al., "Data-Driven Control, Optimization, and Decision-Making in Active Power Distribution Networks", Applied Energy, Vol. 397, 126253, 2025 (Elsevier).
7. Shaorong Zhang, Koji Yamashita, and Nanpeng Yu, "Learning Power System Dynamics with Neural Ordinary Differential Equations," IEEE PES General Meeting, 2024.
8. Shaorong Zhang and Nanpeng Yu, " Learning Power System Dynamics with Nearly-Hamiltonian Neural Networks," IEEE PES General Meeting, 2023.

Honors and Awards

- Outstanding Graduate Student (awarded to top 10%) 06-2022
- Special Scholarship for M.S. Candidate(awarded to top 30%) 10-2021
- Outstanding Graduates(awarded to 20%) 10-2021
- The Gold Awards of the 6th China International College Students' " Internet+" Innovation and Entrepreneurship Competition 11-2020
- The Gold Awards of the 6th China International College Students' " Internet+" Innovation and Entrepreneurship Competition(Trails in shaanxi province) 10-2020
- Special Scholarship for M.S. Candidate(awarded to top 30%) 10-2020
- National Encouragement Scholarship 10-2018