Sheng-An (Samuel) Xu

(+1) 5105423840 shengan_xu@berkeley.edu

Education

University of California, Berkeley Aug. 2025 – Present
PhD Candidate in Industrial Engineering and Operations Research

Nanjing University Sep. 2021 – July 2025
BS in Mathematics and Applied Mathematics

- **GPA:** 4.66/5.00 (Rank 1/48 in major, 2/132 in department)
- **WES Evaluation:** 3.94/4.00
- **Selected Coursework:** Real Analysis (94), Partial Differential Equations (96.3), Topology (96), Advanced Algebra (98), Probability Theory (97), Numerical Analysis (90), Advanced Optimization (100)

University of Wisconsin, Madison (Exchange Program) Jan. 2024 – May 2024

- **GPA:** 4.0/4.0
- **Graduate Coursework:** Real Analysis II, Complex Analysis, Lie Algebra
- **Undergraduate Coursework:** Stochastic Processes, Differential Geometry, Algebraic Topology

Publications

- Yu-Jie Zhang, Sheng-An Xu, Peng Zhao, Masashi Sugiyama. *Generalized Linear Bandits: Almost Optimal Regret with One-Pass Update.* [arXiv]
  In: *Advances in Neural Information Processing Systems 38 (NeurIPS 2025)*, San Diego, California, 2025.

Research Experience

Optimization Based on Diffusion Models Apr. 2024 – Nov. 2024
Advisor: Prof. Caihua Chen, Engineering & Management Dept, Nanjing University

- Aimed to increase optimization efficiency and eliminate the innate uncertainties in black-box scenarios by converting black-box optimization into conditional sampling.
- Transformed the generation of a single output solution into the production of a distribution of high-quality solutions, addressing key issues like the instability of one-step methods and the limited adaptability of traditional numerical approaches.
- Employed iterative methods to generate a trajectory of (point, value) pairs for special integer programming problems; Trained a conditional diffusion model on this trajectory dataset, facilitating the generation of feasible solutions for integer programming problems with variable parameters.
- Applied the discrete diffusion model to optimization problems with graph structures and combined with heuristic sampling methods to improve the quality of the resulting solutions.

Statistical and Computational Efficiency of Non-Linear Bandits Jan. 2025 – May 2025
Advisor: Prof. Peng Zhao, LAMDA@AI Dept, Nanjing University

- Designed and analyzed algorithms to address the generalized linear bandit problem, focusing on achieving joint statistical and computational efficiency.
- Replaced the traditional Maximum Likelihood Estimation (MLE) framework with Online Mirror Descent (OMD) to design more efficient confidence regions.
- Introduced the analysis framework of mix loss and utilized the self-concordance assumption to refine regret analysis, significantly reducing dependency on a condition number and enhancing algorithmic performance.

Honors & Awards

- **Meritorious Prize, American Mathematical Contest in Modeling** (2023)
- **National Scholarship** (0.2% in China, 2021-2022)
- **Jiangsu Province Government Scholarship for Overseas Study for College Students** (2025)
- **Guo-Xie-Birong Scholarship** (Highest Honor in department, 2023-2024)
- **Special Scholarship of Basic Sciences, Nanjing University** (Top 10% in department, 2022, 2023, 2024)
- **Excellent Freshman Student, Nanjing University** (2021-2022)
- **Outstanding Leader, Tian-Jian Voluntary Association, Nanjing University** (2022-2023)

Professional Experience

Machine Learning Engineer Jun. 2024 – Aug. 2024
Nanjing Huihu Intelligence Technology Co., Ltd

- **Natural Language Processing:** Implemented a real-time system to identify, separate, and extract audio clips from videos and audio streams based on distinct voice profiles, ensuring subtitle generation commenced before the halfway mark of each clip; formulated the audio recovery task as a composite optimization problem and applied the accelerated proximal gradient algorithm to tackle it.
- **Computer Vision:** Assessed the stability of video footage recording law enforcement activities using optical flow techniques; utilized SlowFast and YOLOv10 models to track and evaluate law enforcers' movements, achieving scenario classification accuracy exceeding 80%.

Skills

Programming Languages: C++(Proficient), Python(Proficient), MATLAB(Intermediate), R(Intermediate)
Tools: Excel, GitHub, LaTeX, Mathematica, MySQL