Jiaxiang Li

Mathematical Sciences Building, 3131
One Shields Avenue
Davis, CA 95616

Email: jxjli@ucdavis.edu
Phone: +1 (530)-220-3138

Education

University of California, Davis — Davis, CA
Ph.D. Candidate in Applied Mathematics, GPA: 3.97/4.00, Advisor: Shiqian Ma — 2018–Current

Zhejiang University — Hangzhou, China
B.S. in Mathematics, GPA: 3.88/4.00 — 2014–2018

Experience

Meta Platforms, Inc. — Menlo Park, CA
Software Engineer Intern, Machine Learning — June 2022–Sept 2022

- Ads Core Machine Learning ENG Team
- Reinforcement learning based SlateQ long-term value optimization for ads recommendation system
- Design large-scale data pipeline and manage data from huge databases using SQL
- Design and conduct large-scale deep Q-networks training using PyTorch
- Achieve 1.08% ads value gain in offline evaluations

State Key Lab of CAD&CG — Hangzhou, China
Research Intern — Sept 2017–May 2018

- Completed a review article on pulmonary nodule detection by deep learning
- Deep Subspace Clustering Networks for image clustering based on Auto-encoders

Preprints and Publications

[1] **J. Li**, K. Balasubramanian, and S. Ma, "Stochastic dual averaging for optimization on riemannian manifolds", *In preparation*, 2022.

[2] **J. Li**, K. Balasubramanian, and S. Ma, "Stochastic zeroth-order riemannian derivative estimation and optimization", *Mathematics of Operations Research (to appear)*, 2022.

[3] **J. Li** and S. Ma, "Bilevel optimization on riemannian manifolds", *In preparation*, 2022.

[4] **J. Li** and S. Ma, "Federated learning on riemannian manifolds", *arXiv preprint arXiv:2206.05668*, 2022.

[5] **J. Li**, S. Ma, and T. Srivastava, "A riemannian admm", *arXiv preprint arXiv:2211.02163*, 2022.

Skills and Tools

- C/++, Python (PyTorch, TensorFlow, Numpy, Pandas, PySpark, etc.), MATLAB, R, LaTeX, SQL, etc.

Coursework highlights

Probability Theory, Numerical Linear Algebra, Numerical and Combinatorial Optimization, High-dimensional Statistics, Machine Learning, Natural Language Processing, Data Structure, Database

Teaching

- **Teaching Assistant** at UC Davis
  - MAT 168 Optimization
  - MAT 170 Math in Data Science
  - MAT 108 Introduction to Abstract Math
  - MAT 021ABCD Calculus

Research Interest

My research interests lie at the optimization problems arising in machine learning, operations research and other applications. Precisely, I am working on the following topics:

- **Nonconvex Optimization**: Computational complexities for gradient-based and gradient-free algorithms, optimization on Riemannian manifolds and primal-dual optimization algorithms.
- **Variational Inequalities**: Convergence theory for variational inequality with applications in minimax problems.
- **Optimal Transport**: Algorithms for efficiently computing optimal transportation with convergence guarantee.
- **Reinforcement Learning**: Theories for reinforcement learning algorithms, especially for multi-armed bandits.

I am also interested in theory and computation for supervised and unsupervised learning in general.

Academic activities and services

- Paper Reviewer
  AISTATS 2021, ICML 2022, AISTATS 2022
- Modeling and Optimization: Theory and Applications (MOPTA), session speaker — August 2021
- SIAM Conference on Optimization, session speaker — July 2021
- INFORMS Optimization Society Conference, session speaker — March 2022

Honors and Awards

- Graduate Student Fellowship at UC Davis — 2018–2019, 2022-2023
- Mathematical Contest in Modeling, Meritorious Winner (9%) — 2017