Xin Jiang

Institute for Data, Intelligent Systems, and Computation, Lehigh University, PA, 18015
xjiang@lehigh.edu | jiangxjames.github.io | Google Scholar

Research interests

My research is rooted in the mathematical foundations of data science, with primary focuses on theory and algorithms for large-scale optimization problems from engineering and data science and machine learning for graphical data.

Employment

Postdoctoral researcher 08/2022 – present
Lehigh University *Bethlehem, PA*

- Hosted by Program in the Foundations and Applications of Mathematical Optimization and Data Science
- Member in Institute for Data, Intelligent Systems, and Computation (I-DISC) at Lehigh University

Education

Ph.D. Electrical and Computer Engineering 09/2017 – 06/2022
University of California, Los Angeles *Los Angeles, CA*

- Thesis: Bregman first-order proximal splitting methods: Theory and Applications
- Advisor: Lieven Vandenberghe

M.S. Electrical and Computer Engineering 09/2015 – 06/2017
University of California, Los Angeles *Los Angeles, CA*

- Thesis: Minimum rank positive semidefinite matrix completion with chordal sparsity pattern
- Advisor: Lieven Vandenberghe

B.Eng. Electronic and Communication Engineering 09/2012 – 07/2015
The University of Hong Kong *Hong Kong, China*

- First class honors. Minor in Finance
- Thesis: Power optimization in hybrid localization mechanism for logistic applications
- Advisor: Victor O. K. Li

Awards and Honors

Summer Mentored Research Fellowship (SMRF)	2021
Ph.D. Preliminary Exam Fellowship	2018
Dean's Honors List	2013 – 2015
URFP Research Internship Award	2015
Tso Chiu Kit Scholarship	2015
Kai Chong Tong Scholarship	2013 – 2014
Chiap Hua Cheng's Foundation Scholarship	2013
S. Y. King Prize	2012
HKU Worldwide U/G Student Exchange Scholarship	2012

Publications

Preprints (α as alphabetical order, * as equal contribution)

[P1] E. D. H. Nguyen, **X. Jiang**, B. Ying, and C. A. Uribe. Graphs with finite-time consensus and their applications in gradient tracking. 2023.

[P2] (α) F. E. Curtis, **X. Jiang**, and Q. Wang. Almost-sure convergence of iterates and multipliers in stochastic sequential quadratic optimization. 2023.

[P3] C. Yao and **X. Jiang**. A globally convergent difference-of-convex algorithmic framework and application to log-determinant optimization problems. 2023.

[P4] **X. Jiang**, C. Yao, and L. Vandenberghe. Inexact proximal splitting methods for Euclidean distance matrix optimization. 2023.

[P5] **X. Jiang** and L. Vandenberghe. The solution path for a class of generalized total-variation problems. 2022.

[P6] **X. Jiang** and L. Vandenberghe. A unified framework for isotonic regularization and 1D anisotropic total variation regularization. 2022.

[P7] **X. Jiang**, K. Cheng, S. Jiang, and Y. Sun. Chordal-GCN: Exploiting sparsity in training large-scale graph convolutional networks. 2019.

Journal articles

[J1] **X. Jiang**, Y. Sun, M. S. Andersen, and L. Vandenberghe. Minimum-rank positive semidefinite matrix completion with chordal patterns and applications to semidefinite relaxations. *Applied Set-Valued Analysis and Optimization*. 2023.

[J2] **X. Jiang** and L. Vandenberghe. Bregman three-operator splitting methods. *Journal of Optimization Theory and Applications*. 2023.

[J3] **X. Jiang** and L. Vandenberghe. Bregman primal–dual first-order method and application to sparse semidefinite programming. *Computational Optimization and Applications*, 2022.

Conference Proceedings

[C1] J. Xu, R. Huang, **X. Jiang**, Y. Cao, C. Yang, C. Wang, and Y. Yang. Better with less: A data-centric perspective on pre-training graph neural networks. In *Proceedings of the 37th Conference on Neural Information Processing Systems (NeurIPS)*, 2023.

[C2] J. Xu, Y. Sun, **X. Jiang**, Y. Wang, C. Wang, J. Lu, and Y. Yang. Blindfolded attackers still threatening: Strict black-box adversarial attacks on graphs. In *Proceedings of the 36th Conference on Artificial Intelligence (AAAI)*, 2022.

[C3] J. Xu, Y. Yang, J. Chen, **X. Jiang**, C. Wang, J. Lu, and Y. Sun. Unsupervised adversarially robust representation learning on graphs. In *Proceedings of the 36th Conference on Artificial Intelligence (AAAI)*, 2022.

[C4] Z. Jiao*, Z. Zhang*, **X. Jiang**, D. Han, S.-C. Zhu, Y. Zhu, and H. Liu. Consolidating kinematic models to promote coordinated mobile manipulations. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2021.

Presentations

On the almost-sure convergence of a stochastic SQP method 10/2023
INFORMS Annual Meeting *Phoenix, AZ*

A globally convergent difference-of-convex algorithmic framework

- Modeling and Optimization: Theory and Applications (MOPTA), Bethlehem, PA, 08/2023

- SIAM Conference on Optimization (OP23), Seattle, WA, 05/2023
- 57th Annual Conference on Information Sciences and Systems, Baltimore, MD, 03/2023

Primal–dual proximal optimization methods with Bregman distances

- Invited talk in Optimal Transport and Mean Field Games Seminar, University of South Carolina, 11/2022
- Invited talk in Optimization and Data Science Seminar, UCSD, 10/2022
- Invited talk in Department of Mathematics, UCLA, 09/2022
- SIAM Conference on Mathematics of Data Science (MDS22), San Diego, CA, 09/2022

Bregman proximal methods for semidefinite optimization

- EUROPT Workshop on Continuous Optimization, Toulouse, France, 07/2021
- SIAM Conference on Optimization (OP21), virtual, 07/2021

Bregman primal–dual first-order methods 11/2020
INFORMS Annual Meeting *Virtual*

Teaching and Mentorship

Teaching Experience

Teaching Assistant (five times) 2017 – 2022
ECE236B Convex Optimization *UCLA*

Teaching Assistant (four times) 2017 – 2021
ECE133A Applied Numerical Computing *UCLA*

Teaching Assistant (twice) 2019 – 2022
ECE236C Optimization Methods for Large-Scale Systems *UCLA*

Teaching Assistant Fall 2020
ECE205A Matrix Analysis for Scientists and Engineers *UCLA*

Mentorship Experience

Summer Research Program Supervisor 06/2021 – 08/2021
Summer Undergraduate Research Program (SURP) *UCLA*

- Project: Solving large-scale non-metric multidimensional scaling using ADMM
- Co-supervised (with Prof. Lieven Vandenberghe) two undergraduate students on a summer research project

Academic Mentor 06/2019 – 08/2019
Research in Industrial Projects for Students (RIPS) Program *IPAM, UCLA*

- Project: Obstacle avoidance of autonomous vehicles
- Guided four international undergraduates to work on an industrial project
- Communicated with industrial sponsor Amazon for technical assistance

I am also fortunate to supervise self-motivated junior students on various research projects.

- Qi Wang (PhD, ISE, Lehigh), Jiaxin Liu (PhD, CSE, Lehigh), Rishad Islam Shantho (PhD, CSE, Lehigh), Shujing Feng (MS, CSE, Lehigh), Edward D. H. Nguyen (PhD, ECE, Rice), Chaorui Yao (PhD, ECE, UCLA), Renhong Huang (MS, CS, ZJU)

Professional Services

Journal reviewer

Mathematical Programming · SIAM Journal on Optimization · Mathematics of Operations Research · Journal of Machine Learning Research · IEEE Transactions on Pattern Analysis and Machine Intelligence · Journal of Scientific Computing · Optimization Letters · Journal of Industrial and Management Optimization · IEEE Transactions on Neural Networks and Learning Systems

Conference reviewer

International Conference on Machine Learning (ICML) · AAAI Conference on Artificial Intelligence (AAAI) · International Conference on Learning Representations (ICLR)

Organization of workshops and seminars

- Session chair in INFORMS Annual Meeting, 2023
- Session chair in Model and Optimization: Theory and Applications (MOPTA), 2023
- Session chair in SIAM Conference on Optimization (OP23), 2023
- Session chair in SIAM Conference on Mathematics of Data Science (MDS22), 2022
- Session chair in International Conference on Continuous Optimization (ICCOPT), 2022

Experience

Research Internship 01/2020 – 09/2020

Damo Academy, Alibaba *Seattle, WA*

- Work in the Decision Intelligence (Foundation) Group, supervised by Wotao Yin
- Participated in designing MindOpt, an optimization solver for large-scale linear programs
- Developed algorithms for bottom-level numerical linear algebra, and re-designed data structure

IEEE Eta Kappa Nu (HKN) 01/2014 – present

Department of Electrical and Electronic Department, HKU *Hong Kong, China*

- Participated as a student member of Lambda Iota Chapter, IEEE-HKN, a student honor society of IEEE
- Conducted tutorials to mentor juniors on their coursework