

# XIA JIANG

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Department of Systems Engineering and Engineering Management

William M.W. Mong Engineering Building, The Chinese University of Hong Kong

## SUMMARY

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Researcher in optimization and computation for multi-agent networks.

Possessing a highly adaptable mathematical, scientific, and engineering background.

A dedicated problem-solver with strong interpersonal and presentation skills.

## EDUCATION

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**Ph.D.**                      **Beijing Institute of Technology, China**

09/2018-06/2023    School of Automation

Supervisor: Jie Chen

**Visiting Ph.D.**        **Nanyang Technological University, Singapore**

09/2021-08/2022    School of Electrical and Electronic Engineering

Supervisor: Lihua Xie

**Master**                **Beijing Institute of Technology, China**

09/2017-07/2018    School of Automation

**Bachelor**             **Shandong University**

09/2013-07/2017    School of Control Science and Engineering

## EXPERIENCE

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**Research Associate**                      **The Chinese University of Hong Kong, Hong Kong**

10/2023-09/2024              Department of Systems Engineering and Engineering Management

Supervisor: Anthony Man-Cho So      Research Direction: Minimax optimization

## RESEARCH INTERESTS

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- Distributed optimization: non-convex optimization, non-smooth optimization
- Stochastic optimization: variance reduction, random reshuffling
- Minimax game theory
- Applications: decentralized deep learning training, sensor network, etc.

## PUBLICATIONS

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1. **X. Jiang**, X. Zeng, J. Sun and J. Chen. Distributed synchronous and asynchronous algorithms for semi-definite programming with diagonal constraints (Regular Paper). IEEE Transactions on Automatic Control, vol. 68, no. 2, pp. 1007-1022, Feb. 2023, doi: 10.1109/TAC.2022.3170529.
2. **X. Jiang**, X. Zeng, J. Sun, J. Chen and L. Xie. Distributed stochastic proximal algorithm with random reshuffling for nonsmooth finite-sum optimization. IEEE Transactions on Neural Networks and Learning Systems, 2022, doi: 10.1109/TNNLS.2022.3201711.
3. **X. Jiang**, X. Zeng, J. Sun and J. Chen. Distributed stochastic gradient tracking algorithm with variance reduction for non-convex optimization. IEEE Transactions on Neural Networks and Learning Systems, vol. 34, no. 9, pp. 5310-5321, Sept. 2023, doi: 10.1109/TNNLS.2022.3170944.

4. **X. Jiang**, X. Zeng, J. Sun and J. Chen. Distributed solver for discrete-time Lyapunov equations over dynamic networks with linear convergence rate. *IEEE Transactions on Cybernetics*, vol. 52, no. 2, pp. 937-946, Feb. 2022, doi: 10.1109/TCYB.2020.2989835.
5. **X. Jiang**, X. Zeng, J. Sun and J. Chen. Distributed proximal gradient algorithm for non-smooth non-convex optimization over time-varying networks. *IEEE Transactions on Control of Network Systems*, vol. 10, no. 2, pp. 1005-1017, June 2023, doi: 10.1109/TCNS.2022.3213706.
6. **X. Jiang**, X. Zeng, J. Sun and J. Chen. A fully distributed hybrid control framework for non-differentiable multi-agent optimization. *IEEE/CAA Journal of Automatica Sinica*, vol. 9, no. 10, pp. 1–9, Oct. 2022.
7. **X. Jiang**, X. Zeng, J. Sun and J. Chen. Distributed hybrid impulsive algorithm with supervisory resetting for nonlinear optimization problems. *International Journal of Robust and Nonlinear Control*, 2021; 31: 3230– 3247. <https://doi.org/10.1002/rnc.5451>.
8. **X. Jiang**, X. Zeng, L. Xie and J. Sun. Variance-reduced shuffling gradient descent with momentum for finite-sum minimization. *IEEE Control Systems Letters & IEEE CDC 2023*, vol. 7, pp. 1700-1705, 2023.
9. **X. Jiang**, X. Zeng, J. Sun and J. Chen. The research status and prospect of distributed optimization for multiple aircrafts. *Acta Aeronauticae Astronautica Sinica*, 2021,42(3):524551(in Chinese). doi: 10.7527/S1000-6893.2020.24551.
10. **X. Jiang**, X. Zeng, J. Sun and J. Chen. Hybrid protocol for distributed non-differentiable extended monotropic optimization. *The 16th IEEE International Conference on Control and Automation*, Japan, 2020, pp. 654-659.
11. **X. Jiang**, X. Zeng, J. Sun and J. Chen. Distributed algorithm for controllability test of discrete-time linear systems. *2019 Chinese Control Conference (CCC)*, Guangzhou, China, 2019, pp. 5600-5605.
12. **X. Jiang**, X. Zeng, J. Sun and J. Chen. Distributed algorithm for discrete-time Lyapunov equations. *The 15th International Conference on Control, Automation, Robotics and Vision*, Singapore, 2018, pp. 768-773.

#### Working papers

1. **X. Jiang**, Y. Fang, X. Zeng, J. Sun and J. Chen. Inexact proximal gradient algorithm with random reshuffling for nonsmooth optimization. *Science China Information Sciences*. Major revision.
2. **X. Jiang**, X. Zeng, L. Xie, J. Sun and J. Chen. Distributed stochastic projection-free solver for constrained optimization. *IEEE Transactions on Automatic Control*. Under the second round review.
3. **X. Jiang**, X. Zeng, L. Xie, J. Sun and J. Chen. Variance-reduced reshuffling gradient descent for non-convex optimization: Centralized and distributed algorithms. *Automatica*. Under review.

#### Patent issued

1. J. Sun, **X. Jiang**, X. Zeng and J. Chen. Distributed image segmentation method based on sparsity and Burer-Monteiro decomposition. CN, Patent, no. ZL2021103583346, 2021.
2. G. Lu, K. Li, G. Chen, W. Shen, Y. Wang, **X. Jiang**, Y. Qie and Z. Gao. Automated logistics sorting system. CN, Patent, no. ZL201610824855.5, 2018.

## AWARDS AND HONORS

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- Excellent Doctoral Dissertations (Jun. 2023)
  - Outstanding PhD Graduates of Beijing Institute of Technology (Jun. 2023)
  - National Scholarship (Dec. 2022)
  - Outstanding Doctoral Dissertation Seedling Fund (Jun. 2022)
  - First Prize in Beijing Institute of Technology Academic Scholarship Award (2021, 2022)
  - Chinese Government Scholarship (Aug. 2020)

- Second Prize of the 17th China Graduate Mathematical Contest in Modeling (Nov. 2020)
- Outstanding Graduate Student of Shandong University (Apr. 2017)
- National Encouragement Scholarship (Dec. 2014, Dec. 2015, Dec. 2016)
- Outstanding Student Scholarship of Shandong University (Dec. 2014, Dec. 2015, Dec. 2016)