

## EDUCATION

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<b>Peking University</b> M.S. in Data Science	Sep 2022–Current
<b>University of California, Berkeley</b> Exchange Program, GPA: 4.0/4.0	Jan 2022–May 2022
<b>Xi'an Jiaotong University</b> B.S. in Mathematics (Honors Program), GPA: 4.01/4.3, Major rank:1/50	Sep 2018–July 2022

## RESEARCH & PROJECT EXPERIENCE

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### Research Topic: Algorithm Design for Solving Variational Inequalities

Jan 2022–Current, University of California, Berkeley

Collaborators: [Michael I. Jordan](#), [Tatjana Chavdarova](#), [Matteo Pagliardini](#)

- Worked on the project *solving variational inequalities via a first-order interior point-based method* with Tatjana Chavdarova and Michael I. Jordan. This paper has been accepted by *NeurIPS 2022 Workshop OPT*. The full version has been accepted by *ICLR 2023* as *spotlight* paper. (<https://arxiv.org/abs/2206.10575>)
  1. Designed a new algorithm whose convergence rate could match the theoretical lower bound of this algorithm under mild conditions.
  2. Verified the theoretical results on several experiments (e.g. GANs).
- Improved the previous work with Michael I. Jordan, Tatjana Chavdarova, and Matteo Pagliardini. We are going to submit this work to *ICML 2023*. (<https://arxiv.org/abs/2210.15659>)
  1. Derived a way to relax the assumptions in the previous work while maintaining the same convergence rate.
  2. Gave the *first* analytically derived last-iterate convergence rate for general monotone variational inequalities.
  3. Managed to finish the book-long proofs (about 40 pages) within a week.

### Research Topic: Cascade Optimization for Inverse Problems with Entropy-Preserving Hyperparameter Tuning

July 2022–Current, New York University

Collaborators: [Qi Lei](#), [Quan Zhang](#), Tianci Liu

- Proposed an automated and principled framework to solve inverse problems with deep generative models. We are going to submit this work to *ICML 2023*. (<https://arxiv.org/abs/2210.13983>)
  1. Designed a cascade optimization algorithm that has a global convergence guarantee to efficiently reconstruct images in inverse problems.

2. Developed a method to solve a bilevel optimization problem for automated hyperparameter tuning.

### **Research Topic: Design of Efficient Algorithms for Finding Points on High-dimensional Convex Polyhedra**

Sep 2021–Jan 2022, Peking University

Advisor: [Zhouchen Lin](#)

- My first project on optimization and machine learning theory.
  1. Studied convex analysis with a focus on interior point methods and common first-order methods.
  2. Designed a new interior-point algorithm to find a point on a high-dimensional convex polyhedron efficiently.

### **Research Topic: Multi-task Self-supervised Object Detection and Other Tasks in Machine Learning**

June 2020–Jan 2022, Xi'an Jiaotong University

Adviser: [Junmin Liu](#)

- This is my first deep learning project.
  1. Reproduced classical backbones in Computer Vision, such as ResNet, the Transformer, and Vision Transformer (ViT) using Pytorch.
  2. Reproduced two-stage object detection networks using Pytorch, including R-CNN, Fast R-CNN, and Faster R-CNN, etc.
  3. Studied different self-supervised object detection models.
  4. Designed new auxiliary tasks for two-stage multi-task self-supervised object detection models.

## **COMPETITION EXPERIENCE**

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- The first prize of China Undergraduate Mathematical Contest in Modeling in Shaanxi division, 2019.
- The first prize of China Undergraduate Mathematical Contest in Modeling in Shaanxi division, 2020.
- Honorable Mention of Mathematical Contest In Modeling, 2020.
- The second prize of The Chinese Mathematics Competitions (Mathematics Group), 2019.
- The first prize of Campus Mathematical Contest in Modeling, 2019.
- The second prize of Campus Collegiate Programming Contest, 2021.

## **SCHOLARSHIPS & AWARDS**

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- Outstanding Student of Xi'an Jiaotong University (2%), 2018-2019, 2019-2020, 2020-2021.
- National Encouragement Scholarship (3%), 2018-2019.
- HIWIN Scholarship (1%), 2019-2020.
- ZhuFeng Scholarship (1%), 2018-2019, 2019-2020.
- National Scholarship (1%), 2020-2021.