Yunpeng Shi

Contact Information

Program in Applied & Computational Mathematics **Princeton University**
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Research Interests

Cryo-electron Microscopy Imaging, 3D Computer Vision, Robust Estimation, Probability Theory, Optimization, Machine Learning

Education

Ph.D. in Mathematics, University of Minnesota Aug 2020
- Advisor: Prof. Gilad Lerman
- Thesis topic: Robust Synchronization and Its Applications in 3D Computer Vision
- Minor in Computer Science

M.S. in Mathematics, University of Minnesota May 2018

B.A. in Mathematics, Honors Program, University of Minnesota May 2015
- Minor in Statistics
- Summa Cum Lauder

Positions

- **Postdoctral Research Associate**, Sep 2020 - present
  Program in Applied & Computational Mathematics (PACM), Princeton University
- **Graduate Research Assistant**, June 2019 - May 2020
  School of Mathematics, University of Minnesota
- **MnDrive Graduate Assistant**, June 2018 - May 2019
  Informatics Institute, University of Minnesota
- **Graduate Teaching Assistant**, Sep 2016 - May 2018
  School of Mathematics, University of Minnesota

Publications

1. **Y. Shi**, S. Li and G. Lerman, Robust Multi-object Matching via Iterative Reweighting of the Graph Connection Laplacian. *Conference on Neural Information Processing Systems (NeurIPS)*, 2020.
2. **Y. Shi** and G. Lerman, Message Passing Least Squares Framework and its Application to Rotation Synchronization. *International Conference on Machine Learning (ICML)*, 2020.
3. G. Lerman and **Y. Shi**, Robust group synchronization via cycle-edge message passing. arXiv preprint, 2019.
4. **Y. Shi** and G. Lerman, Estimation of camera locations in highly corrupted scenarios: All about that base, no shape trouble. *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2018.
5. G. Lerman, **Y. Shi** and T. Zhang, Exact camera location recovery by least unsquared deviations. *SIAM Journal on Imaging Sciences*, 2018.

Invited Talks

- *Robust group synchronization via cycle-edge message passing*,
  IDeAS Seminar, PACM, Princeton University, Princeton, NJ Feb 2020
- *Robust synchronization via cycle consistency inference*,
  Probability Seminar, University of Minnesota, Minneapolis, MN Nov 2019
- *Exact camera location recovery by least unsquared deviations*,
  Probability Seminar, University of Minnesota, Minneapolis, MN Dec 2017

Conference Presentations

- *Message Passing Least Squares Framework and its Application to Rotation Synchronization.*
  International Conference on Machine Learning (ICML) — July 2020
- *Estimation of camera locations in highly corrupted scenarios: All about that base, no shape trouble* (poster presentation),
  IEEE Conference on Computer Vision and Pattern Recognition (CVPR), Salt Lake City, UT — Jun 2018
- *An evaluation of the effectiveness of ramp meters in reducing traffic congestions using cellular automaton* (oral presentation),
  National Conference on Undergraduate Research, Cheney, WA — Apr 2015

Teaching Experiences

School of Mathematics, **University of Minnesota**, MN, USA

- Graduate Teaching Assistant — Sep 2016 - May 2018
  - Linear Algebra with Applications to Differential Equations — Spring 2018
  - Short Calculus — Fall 2017
  - Calculus II — Spring 2017
  - Calculus I — Fall 2016

Other Professional Travel

- MSRI Summer School: Mathematics of Machine Learning,
  University of Washington & Microsoft Research, Seattle, WA — Aug 2019

Awards

- Vanky Men Fellowship, School of Mathematics, University of Minnesota — Sep 2019
- MnDrive Graduate Research Fellowship in Robotics,
  Informatics Institute, University of Minnesota — June 2018
- Outstanding Graduate in Mathematics, University of Minnesota — May 2015
- Honorable Mention, The Mathematical Contest in Modeling (MCM) — Feb 2014
- Top 1, Mathematical Association of America
  North Central Section Team Competition — Oct 2013

Skills

Python, R, Matlab, Mathematica