Ran Chen (She/Her/Hers)
Massachusetts Institute of Technology
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Research Interests

Data-driven Decision-making, Statistical Machine Learning, Reinforcement Learning, High-dimensional Statistics, Optimization, Nonparametric Statistics, Revenue Management, Healthcare

Academic Appointments

Postdoc Associate 2022 – Present
Laboratory for Information and Decision System
Massachusetts Institute of Technology (MIT)
Advisor: Martin Wainwright

Teaching Fellow 2022
Wharton Data Science Academy

Research Fellow 2022
The Wharton School
University of Pennsylvania
Advisor: Linda Zhao

Education

The Wharton School September 2017 - August 2022
University of Pennsylvania, Philadelphia, USA
Ph.D. in Statistics and Data Science
Dissertation: *Estimation and Inference for Convex Functions and Computational Efficiency in High Dimensional Statistics* (pdf)
Advisor: Tony Cai

Tsinghua University September 2013 - July 2017
Beijing, PRC
B.S. in Pure and Applied Mathematics, GPA: 92/100, with distinction

Papers

1. Cai, T.T., **Chen, R.**, Zhu, Y. (2021).
"Estimation and Inference for Minimizer and Minimum of Convex Functions: Optimality, Adaptivity, and Uncertainty Principles." *Annals of Statistics (to appear). Available here.*

2. Cai, T.T., **Chen, R.**, Zhu, Y. (2021).
"Supplement Paper to Estimation and Inference for Minimizer and Minimum of Convex Functions: Optimality, Adaptivity, and Uncertainty Principles." *Annals of Statistics (to appear). Available here.*

3. Cai, J., **Chen, R.**, Wainwright, M., Zhao, L. (2023).
"Doubly High-Dimensional Contextual Bandits: An Interpretable Model with Applications to Assortment/Pricing" *Management Science (R & R). Available here.*

4. Cai, J., **Chen, R.**, Yang, D., Zhu, W., Shen, H., Zhao, L. (2023).
"Network Regression and Supervised Centrality Estimation." *Journal of American Statistical Association (revision).* Available here.

Preprints

1. **Chen, R.** (2022).
"Interplay Between Statistical Accuracy and Running Time Cost: a Framework and Three Cases." *To be submitted to Operations Research. Available here.*

2. **Chen, R.** (2022).
"Optimal Estimation and Inference for Minimizer and Minimum of Multivariate Additive Convex Functions." *To be submitted to Annals of Statistics. Available here.*

3. Cai, J., **Chen, R.**, Wainwright, M., Zhao, L. (2023).
"Personalized Reinforcement Learning: with Applications to Business."

4. Cai, J., **Chen, R.**, Huang Q., Wainwright, M., Zhao, L., Zhu W. (2023).
"Optimal Assortment and Pricing with Novel Poisson Arrival MNL Models."

5. **Chen, R.**, Liu, H. (2018).
"Heterogeneous Treatment Effect Estimation through Deep Learning." Available at https://arxiv.org/abs/1810.11010.

Working Paper

1. Cai, T.T., **Chen, R.** "Crowdsourcing: Beyond Dawid-Skene Model."(2020).
2. **Chen, R.**, Wainwright, M. (2023). "Tight Constrained Inequality."
3. **Chen, R.**, Smetters, K., Zhang, X. (2023). "Estimation, Inference, and Ranking in Portfolio Choice Problems."
4. **Chen, R.**, Pathak, R., Wainwright, M. (2023). "On Power of Interpolation."

(All papers are in alphabetical order)

Talks

- Doubly High-Dimensional Contextual Bandits: An Interpretable Model for Joint Assortment and Pricing,
  - *Department of Applied Mathematics and Statistics, Johns Hopkins University.* *Feb. 2024*
  - *Department of Statistics, University of Wisconsin-Madison.* *Feb. 2024*
  - *Information Systems and Operations Management, Goizueta Business School, Emory University.* *Feb. 2024*
  - *Department of Technology, Operations, and Statistics, Stern School of Business, New York University.* *Feb. 2024*
  - *Department of Statistics, Stanford University.* *Jan. 2024*
  - *Department of Statistics, University of California, Davis.* *Jan. 2024*
  - *Department of Statistics and Data Science, Washington University in St. Louis.* *Jan. 2024*
  - *Department of Mathematics, Applied Mathematics, and Statistics, Case Western Reserve University.* *Jan. 2024*
  - *Department of Statistics, University of Washington.* *Dec. 2023*
  - *Department of Statistics, Harvard University.* *Nov. 2023*
- Doubly High-Dimensional Contextual Bandits: An Interpretable Model for Joint Assortment and Pricing, *INFORMS 2023, Phoenix.* *Oct. 2023*
- Personalized Reinforcement Learning: with Applications to Business, *Joint Statistical Meeting 2023, Toronto.* *Aug. 2023*
- Dynamic joint assortment and pricing through doubly high-dimensional contextual bandits, *MSOM 2023, Montreal.* *June 2023*
- An Interpretable Machine Learning Model for Assortment/Pricing, *Informs Business Analytics Conference 2023, Aurora.* *April 2023*
- High-dimensional Continuum Armed and High-dimensional Contextual Bandit: with Applications to Assortment and Pricing, *Wharton Customer Analytics with Master Kong Food Company.* *Nov. 2022*

- Statistics, Optimization, and Machine Learning: with Applications in Economics and Business, *Department of Business Economic and Public Policy, The Wharton School, University of Pennsylvania.* *Oct. 2022*
- Crowdsourcing: Beyond Dawid Skene Model, *Joint Statistical Meeting 2020, Philadelphia.* *Aug. 2020*
- Heterogeneous Treatment Effect Estimation through Deep Learning, *Joint Statistical Meeting 2018, Vancouver.* *Aug. 2018*

Selected Awards

- Google Fellowship Nominee (Top 4 across all UPenn schools) Sept. 2020
- Second Place, Wharton Hackathon: Covid and the Economy Sept. 2020
- The George James Doctoral Fellowship, The Wharton School March 2017
- XueTangBan Membership and Scholarship (Tsinghua Xuetang Mathematics Program), Tsinghua University Feb. 2014 - July 2017
- Academic Excellence Honor, Tsinghua University 2014, 2015, 2016
- Tsinghua University Distinguished Student Programme (4 out of 107) 2014
- Second Prize, (National) Regional College Students' Physics Contest 2014
- Silver Medal, China Mathematical Olympiad 2013 Jan. 2013
- Gold Medal, China Girls' Mathematical Olympiad 2012 Aug. 2012
- Second Prize, National High Schools Physics Competition Oct. 2012

Service

- Member of Executive Board, Tsinghua Alumni Association of Greater Boston Nov. 2022 - present
- Director of Public Relations & Propagation and Board Director, Tsinghua Alumni Association of Greater Philadelphia July 2021 - present
- Board Member of the Wharton Society for the Advancement of Women in Business Academia Aug. 2019 - Aug. 2021
- Secondary Treasurer, Tsinghua Alumni Association of Greater Philadelphia Aug. 2019 - July 2021
- Volunteer at the 8th International Congress on Industrial and Applied Mathematics, Beijing Aug. 2015
- Vice President of Student Association of Science and Technology, Tsinghua Math Department June 2015 - Dec. 2016
- Head of Publicity, Planning, and Innovation Office of Student Association of Science and Technology, Tsinghua Math Department June 2014 - June 2015

Teaching

- Teaching Fellow, Wharton Data Science Academy 2022
- TA, Introduction to Python for Data Science (OIDD 477/777/STAT 777) Spring 2022
- TA, Forecasting Methods for Management (STAT 435/535/711) Fall 2021
- TA, Introductory Statistics (STAT 111) Spring 2020, Fall 2020, Spring 2021
  - Led recitation sessions
  - Head TA
- TA, Probability (STAT 430) Fall 2019
- TA, Optimization Methods in Machine Learning (STAT 991, Ph.D.) Spring 2019
  - Oversaw and edited lecture notes for all 18 class sessions.
  - Graded homework and provided solutions
  - Organized group presentations
- TA, Introduction to Business Statistics (STAT 101) Fall 2018

Software

- Developed a Matlab-based, fully functional algorithm for *Drosophila melanogaster* embryo detection and registration. Provided to Professor Bin Yu's group and Lawrence Berkeley National Laboratory.

Skills

- Programming: Proficient in `R, Python, Matlab`, LaTeX; Experienced in `C++`
- Languages: Chinese (Native); English (Fluent)