

## Renbo Zhao

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### Research Interests

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Theory and computational practice for **large-scale optimization algorithms**. My recent research is on optimization algorithms for convex, nonconvex and stochastic optimization.

### Professional Experience

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<b>Tenure-Track Assistant Professor</b> Department of Business Analytics Tippie College of Business, University of Iowa	Aug. 2023 – Now
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### Education

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<b>PhD in Operations Research</b> Massachusetts Institute of Technology Thesis: New Theory and Algorithms for Optimization Problems with Non-Standard Structures Thesis advisor: Robert M. Freund	Sept. 2018 – June 2023
<b>M.Sc. in Mathematics</b> National University of Singapore	Sept. 2016 – June 2018
<b>B.Eng. in Electrical Engineering (First Class Honors)</b> National University of Singapore	Sept. 2011 – June 2015

### Journal Papers

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- J1. Renbo Zhao, “[A Primal-Dual Smoothing Framework for Max-Structured Nonconvex Optimization](#)”, accepted in *Mathematics of Operations Research*, 2022.
- J2. Renbo Zhao, “[Accelerated Algorithms for Stochastic Three-Composite Convex-Concave Saddle Point Problems](#)”, *Mathematics of Operations Research*, Vol. 47, No. 2, Pages 1443-1473, 2022.
- J3. Renbo Zhao and Robert M. Freund, “[Analysis of the Frank-Wolfe Method for Convex Composite Optimization involving a Logarithmically-Homogeneous Barrier](#)”, accepted in *Mathematical Programming (Series A)*, 2022.
- J4. Renbo Zhao, “[Convergence Rate Analysis of the Multiplicative Gradient Algorithm for PET-Type Problems](#)”, accepted in *Operations Research Letters*, 2022.
- J5. Renbo Zhao and Qiuyun Zhu, “[A Generalized Frank-Wolfe Method With “Dual Averaging” for Strongly Convex Composite Optimization](#)”, accepted in *Optimization Letters*, 2022.

- J6. Renbo Zhao, William B. Haskell and Vincent Y. F. Tan, “[Stochastic L-BFGS: Improved Convergence Rates and Practical Acceleration Strategies](#)”, *IEEE Transactions on Signal Processing*, Vol. 66, No. 5, Pages 1155–1169, 2018.
- J7. Renbo Zhao and Vincent Y. F. Tan, “[A Unified Convergence Analysis of the Multiplicative Update Algorithm for Regularized Nonnegative Matrix Factorization](#)”, in *IEEE Transactions on Signal Processing*, Vol. 66, No. 1, Pages 129–138, 2018.
- J8. Changho Suh, Vincent Y. F. Tan and Renbo Zhao, “[Adversarial Top- \$K\$  Ranking](#)”, in *IEEE Transactions on Information Theory*, Vol. 63, No. 4, Pages 2201–2225, 2017.
- J9. Renbo Zhao and Vincent Y. F. Tan, “[Online Nonnegative Matrix Factorization with Outliers](#)”, in *IEEE Transactions on Signal Processing*, Vol. 65, No. 3, Pages 555–570, 2017.

## Teaching Experience

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Instructor at University of Iowa for:

- BAIS:9100: Data and Decisions Fall 2023

Teaching Assistant at MIT for:

- 15.075: Statistical Thinking and Data Analysis (Undergraduate) Spring 2022
- 6.252/15.084: Nonlinear Optimization (Doctoral) Spring 2021
- 6.251/15.081: Introduction to Mathematical Programming (Doctoral) Fall 2020