

Baoyu Zhou

CONTACT INFORMATION	Harper Center 5807 S Woodlawn Avenue Chicago, IL 60637	+1 (551) 228-9835 baoyu.zhou@chicagobooth.edu https://baoyuzhou18.github.io
RESEARCH INTERESTS	Huge-scale Linear Optimization, Large-scale Nonlinear Optimization, Constrained Stochastic Optimization, Nonsmooth Optimization, Optimization Methods for Machine Learning	
ACADEMIC POSITIONS	Postdoctoral Researcher The University of Chicago , Chicago, IL <i>Booth School of Business</i> Supervisor: Prof. Haihao (Sean) Lu Topics: Huge-scale Linear Optimization	Aug. 2022 – present
EDUCATION	Lehigh University Ph.D. in Industrial & Systems Engineering Advisor: Prof. Frank E. Curtis Doctoral Committee: Frank E. Curtis (Lehigh), Albert S. Berahas (U of Michigan), Jorge Nocedal (Northwestern), Daniel P. Robinson (Lehigh), and Luis Nunes Vicente (Lehigh) M.S. in Industrial & Systems Engineering Shanghai Jiao Tong University B.S.E. in Mechanical Engineering The Chinese University of Hong Kong Undergraduate Exchange Student	Aug. 2018 – May 2022 Aug. 2016 – May 2018 Aug. 2012 – Aug. 2016 Jan. 2015 – Apr. 2015
RESEARCH EXPERIENCE	Research Assistant Lehigh University , Bethlehem, PA <i>Department of Industrial & Systems Engineering</i> Supervisor: Prof. Frank E. Curtis Topics: Large-scale Nonlinear Optimization, Constrained Stochastic Optimization Research Intern Facebook, Inc. , New York, NY <i>Facebook AI Research</i> Supervisor: Dr. Aaron Defazio Topics: Nonconvex and Stochastic Optimization with Deep Learning Applications. Givens Associate Argonne National Laboratory , Lemont, IL <i>Mathematics and Computer Science Division</i> Supervisor: Dr. Jeffrey M. Larson Topics: Composite Nonsmooth Optimization under Derivative-Free Setting. Visiting Research Assistant Northwestern University , Evanston, IL <i>Department of Industrial Engineering and Management Sciences</i> Supervisor: Prof. Andreas Wächter Topics: Quadratic Programming with Bound Constraints.	Aug. 2018 – May 2022 May 2021 – Aug. 2021 May 2020 – Aug. 2020 June 2017 – Aug. 2017

**PUBLISHED
JOURNAL
ARTICLES**

- [1] A. S. Berahas, J. Shi, Z. Yi, and **B. Zhou**. Accelerating Stochastic Sequential Quadratic Programming for Equality Constrained Optimization using Predictive Variance Reduction. *Computational Optimization and Applications*, <https://doi.org/10.1007/s10589-023-00483-2>, 2023.
- [2] A. S. Berahas, F. E. Curtis, and **B. Zhou**. Limited-Memory BFGS with Displacement Aggregation. *Mathematical Programming*, 194(1):121-157, 2022.
- [3] J. Larson, M. Menickelly, and **B. Zhou**. Manifold Sampling for Optimizing Nonsmooth Non-convex Compositions. *SIAM Journal on Optimization*, 31(4):2638-2664, 2021.
- [4] A. S. Berahas, F. E. Curtis, D. P. Robinson, and **B. Zhou**. Sequential Quadratic Optimization for Nonlinear Equality Constrained Stochastic Optimization. *SIAM Journal on Optimization*, 31(2):1352-1379, 2021.
- [5] F. E. Curtis, D. P. Robinson, and **B. Zhou**. A Self-Correcting Variable-Metric Algorithm Framework for Nonsmooth Optimization. *IMA Journal of Numerical Analysis*, 40(2):1154-1187, 2020.

**PAPERS
UNDER
REVIEW**

- [6] F. E. Curtis, D. P. Robinson, and **B. Zhou**. Sequential Quadratic Optimization for Stochastic Optimization with Deterministic Nonlinear Inequality and Equality Constraints. arXiv 2302.14790, 2023. (*under review at SIAM Journal on Optimization*)
- [7] A. S. Berahas, M. Xie, and **B. Zhou**. A Sequential Quadratic Programming Method with High Probability Complexity Bounds for Nonlinear Equality Constrained Stochastic Optimization. arXiv 2301.00477, 2023. (*under review at SIAM Journal on Optimization*)
- [8] A. S. Berahas, R. Bollapragada, and **B. Zhou**. An Adaptive Sampling Sequential Quadratic Programming Method for Equality Constrained Stochastic Optimization. arXiv 2206.00712, 2022. (*under review at Mathematical Programming*)
- [9] F. E. Curtis, D. P. Robinson, and **B. Zhou**. Inexact Sequential Quadratic Optimization for Minimizing a Stochastic Objective Function Subject to Deterministic Nonlinear Equality Constraints. arXiv 2107.03512, 2021. (*under review at INFORMS Journal on Optimization*)

PREPRINTS

- [10] A. Defazio, **B. Zhou**, and L. Xiao. Grad-GradaGrad? A Non-Monotone Adaptive Stochastic Gradient Method. arXiv 2206.06900, 2022.

DISSERTATIONS

- [11] **B. Zhou**. Methods for Large Scale Nonlinear Optimization and Equality Constrained Stochastic Optimization. Ph.D. Thesis, Department of Industrial & Systems Engineering, Lehigh University, Bethlehem, PA, USA, 2022.
- [12] **B. Zhou**. Quadratic Optimization for Nonsmooth Optimization Algorithms: Thoery and Numerical Experiments. Master Thesis, Department of Industrial & Systems Engineering, Lehigh University, Bethlehem, PA, USA, 2018.

**TECHNICAL
REPORTS**

- [13] H. Huang, H. Feng, **B. Zhou**, E. Pan, and L. Xi. Multi-Objective Cell Formation Problem Considering Mixed-Type Data of Parts. *Technical Report* (in Chinese), 2016.

PRESENTATIONS

- [1] Baoyu Zhou. SQP Methods for Deterministically Constrained Stochastic Optimization. *Department of Systems and Industrial Engineering, The University of Arizona, Tucson, AZ, USA*, February 2023.
- [2] Baoyu Zhou. SQP Methods for Inequality Constrained Stochastic Optimization. *INFORMS Annual Meeting, Indianapolis, IN, USA*, October 2022.
- [3] Baoyu Zhou. SQP Methods for Deterministically Constrained Stochastic Optimization. *FutureBAProf Workshop, The University of Iowa, Iowa City, IA, USA*, August 2022.

- [4] Baoyu Zhou. SQP Methods for Inequality Constrained Stochastic Optimization. *International Conference on Continuous Optimization, Bethlehem, PA, USA*, July 2022.
- [5] Baoyu Zhou. Fast, Efficient and Practical Algorithms for Nonlinear Optimization. *Department of Industrial, Manufacturing and Systems Engineering, Texas Tech University, Lubbock, TX, USA*, December 2021.
- [6] Baoyu Zhou. An Inexact Sequential Quadratic Method For Nonlinear Equality Constrained Stochastic Optimization. *INFORMS Annual Meeting, Anaheim, CA, USA*, October 2021.
- [7] Baoyu Zhou. Manifold Sampling for Optimizing Nonsmooth Nonconvex Compositions. *MOPTA Conference (Virtual), Bethlehem, PA, USA*, August 2021.
- [8] Baoyu Zhou. SQP for Nonlinear Equality Constrained Stochastic Optimization. *MOPTA Conference (Virtual), Bethlehem, PA, USA*, August 2021.
- [9] Baoyu Zhou. SQP Methods for Equality Constrained Stochastic Optimization. *SIAM Conference on Optimization (Virtual), Spokane, WA, USA*, July 2021.
- [10] Baoyu Zhou. Manifold Sampling for Optimizing Nonsmooth Nonconvex Compositions. *SIAM Conference on Computational Science and Engineering (Virtual), Fort Worth, TX, USA*, March 2021.
- [11] Baoyu Zhou. Manifold Sampling for Optimizing Nonconvex Piecewise-Smooth Compositions. *INFORMS Annual Meeting (Virtual), National Harbor, MD, USA*, November 2020.
- [12] Baoyu Zhou. Limited-Memory BFGS with Displacement Aggregation. *INFORMS Annual Meeting, Seattle, WA, USA*, October 2019.
- [13] Baoyu Zhou. Limited-Memory BFGS with Displacement Aggregation. *MOPTA Conference, Bethlehem, PA, USA*, August 2019.

TEACHING EXPERIENCE

Bootcamp Organizer and Instructor Lehigh University, Bethlehem, PA	Aug. 2021
Teaching Assistant Mentor Shanghai Jiao Tong University, Shanghai, China	Sept. 2014 – Aug. 2016
Undergraduate Teaching Assistant Shanghai Jiao Tong University, Shanghai, China	
VV156: Honors Calculus II	Fall 2013, Spring 2014, Fall 2015
VM240: Intro to Dynamics and Vibrations	Summer 2015

PROFESSIONAL EXPERIENCE

Cost Engineer Intern Fiat Chrysler Automobiles, Shanghai, China	Mar. 2016 – May 2016
Technical Assistant Intern Shenyang Blower Works Group Corporation, Shenyang, China	Aug. 2015 – Sept. 2015

HONORS & AWARDS

Elizabeth V. Stout Dissertation Award, Lehigh University	2022
SIAM Student Travel Award	2021
Van Hoesen Family Best Publication Award, Lehigh ISE Department	2021
P.C. Rossin Doctoral Fellow, Lehigh University	2021
Ph.D. Student of the Year, Lehigh ISE Department	2021
Lehigh University Fellowship	2018 – 2019
Outstanding Freshman Scholarship, Shanghai Jiao Tong University	2012 – 2016

**MENTORSHIP
EXPERIENCE**

Ph.D. Students

- Jinwen Yang (University of Chicago) 2023 – present
co-supervised with Prof. Haihao (Sean) Lu
 Topics: Quasi-Newton methods for Constrained Optimization Problems
- Jiahao Shi (University of Michigan) 2021 – present
co-supervised with Prof. Albert S. Berahas
 Topics: Algorithms for Constrained Stochastic and Derivative-Free Optimization

Undergraduate Students

- Zihong Yi (University of Michigan) 2021 – 2022
co-supervised with Prof. Albert S. Berahas
 Topics: Accelerating Stochastic Sequential Quadratic Programming for Equality Constrained Optimization using Predictive Variance Reduction

**ACADEMIC
SERVICE**

Professional Affiliations

- Society for Industrial and Applied Mathematics (SIAM) 2021 – present
- Institute for Operations Research and Management Sciences (INFORMS) 2018 – present

Professional Community Service

- Vice President, Lehigh University INFORMS Student Chapter 2020 – 2021

Organized Conference Sessions

- ICCOPT Conference
 - *Advances in Nonlinear Optimization*, Bethlehem, PA, USA, July 2022.
 - *Large-Scale, Nonlinear, and Stochastic Optimization IV*, Bethlehem, PA, USA, July 2022.
- INFORMS Annual Meeting
 - *Recent Advances in Nonlinear and Stochastic Optimization*, Indianapolis, IN, USA, October 2022.
 - *Nonlinear and Stochastic Optimization*, Indianapolis, IN, USA, October 2022.
 - *Advances in Nonlinear and Stochastic Optimization (I–II)*, Anaheim, CA, USA, October 2021.
 - *Optimization in Quantum Computing and vice versa I*, Anaheim, CA, USA, October 2021.
- MOPTA Conference
 - *Nonlinear and Stochastic Optimization Algorithms*, Bethlehem, PA, USA, August 2021.
 - *Algorithms for Derivative-Free Optimization*, Bethlehem, PA, USA, August 2021.
- SIAM Conference on Optimization
 - *Recent Advances in Large-Scale Nonlinear Optimization (I–IV)*, Seattle, WA, USA, May 2023.

Journals Reviewed for (# of articles reviewed)

- Computational Optimization and Applications (3)
- IEEE Transactions on Automatic Control (1)
- IEEE Transactions on Network Science and Engineering (1)
- IEEE Transactions on Neural Networks and Learning Systems (3)

- IEEE Transactions on Pattern Analysis and Machine Intelligence (1)
- Journal of Machine Learning Research (1)
- Journal of Optimization Theory and Applications (1)
- Machine Learning (1)
- Management Science (1)
- Mathematical Programming (2)
- Mathematical Programming Computation (1)
- Mathematics of Computation (1)
- Optimization Methods and Software (2)
- SIAM Journal on Matrix Analysis and Applications (1)
- SIAM Journal on Optimization (2)

Conferences Reviewed for (# of articles reviewed)

- When Machine Learning meets Dynamical Systems: Theory and Applications (MLmDS) Workshop, AAAI 2023 (1)
- Optimization for Machine Learning (OPT) Workshop, NeurIPS 2022 (3)
- New Frontiers in Federated Learning (NFFL) Workshop, NeurIPS 2021 (3)
- Optimization for Machine Learning (OPT) Workshop, NeurIPS 2021 (3)
- Optimization for Machine Learning (OPT) Workshop, NeurIPS 2020 (4)

COURSES

Convex Analysis; Planning & Scheduling in Manufacturing & Services; Optimization Models & Applications; Nonlinear Optimization; Random Processes & Applications; Intro to Math Optimization; Real Analysis I; Discrete Optimization; Computational Methods in Optimization; Dynamic Programming; Applied Operations Research; Optimization Methods in Machine Learning; Mining of Large Datasets; Quantum Computing for Optimization

COMPUTER SKILLS

Programming Language: C/C++, Julia, MATLAB, Python, R
Software: AMPL, LINGO, Mathematica, L^AT_EX
Solver: CPLEX, MOSEK, GUROBI, SEDUMI

LANGUAGES

Mandarin (*native language*), English (*bilingual proficiency*)