

# Baoyu Zhou

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<b>CONTACT INFORMATION</b>	Harper Center 5807 S Woodlawn Avenue Chicago, IL 60637	+1 (551) 228-9835 baoyu.zhou@chicagobooth.edu <a href="https://baoyuzhou18.github.io">https://baoyuzhou18.github.io</a>
<b>RESEARCH INTERESTS</b>	Huge-scale Linear Optimization, Large-scale Nonlinear Optimization, Constrained Stochastic Optimization, Nonsmooth Optimization, Optimization Methods for Machine Learning.	
<b>ACADEMIC POSITIONS</b>	<b>Postdoctoral Researcher</b> <b>The University of Chicago</b> , Chicago, IL <i>Booth School of Business</i> Supervisor: Prof. Haihao (Sean) Lu Topics: Huge-scale Linear Optimization	Aug. 2022 – present
<b>EDUCATION</b>	<b>Lehigh University</b> 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 <b>Shanghai Jiao Tong University</b> B.S.E. in Mechanical Engineering <b>The Chinese University of Hong Kong</b> Undergraduate Exchange Student	Aug. 2018 – May 2022 Aug. 2016 – May 2018 Aug. 2012 – Aug. 2016 Jan. 2015 – Apr. 2015
<b>RESEARCH EXPERIENCE</b>	<b>Research Assistant</b> <b>Lehigh University</b> , Bethlehem, PA <i>Department of Industrial &amp; Systems Engineering</i> Supervisor: Prof. Frank E. Curtis Topics: Large-scale Nonlinear Optimization; Constrained Stochastic Optimization. <b>Research Intern</b> <b>Facebook, Inc.</b> , New York, NY <i>Facebook AI Research</i> Supervisor: Dr. Aaron Defazio Topics: Nonconvex and Stochastic Optimization with Deep Learning Applications. <b>Givens Associate</b> <b>Argonne National Laboratory</b> , Lemont, IL <i>Mathematics and Computer Science Division</i> Supervisor: Dr. Jeffrey M. Larson Topics: Composite Nonsmooth Optimization under Derivative-Free Setting. <b>Visiting Research Assistant</b> <b>Northwestern University</b> , 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, F. E. Curtis, and **B. Zhou**. Limited-Memory BFGS with Displacement Aggregation. *Mathematical Programming*, 194(1):121-157, 2022.
- [2] J. Larson, M. Menickelly, and **B. Zhou**. Manifold Sampling for Optimizing Nonsmooth Non-convex Compositions. *SIAM Journal on Optimization*, 31(4):2638-2664, 2021.
- [3] 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.
- [4] 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**

- [5] 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*)
- [6] A. S. Berahas, J. Shi, Z. Yi, and **B. Zhou**. Accelerating Stochastic Sequential Quadratic Programming for Equality Constrained Optimization using Predictive Variance Reduction. arXiv 2204.04161, 2022. (*under review at Computational Optimization and Applications*)
- [7] 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**

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

**DISSERTATIONS**

- [9] **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.
- [10] **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**

- [11] 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. *FutureBAProf Workshop, The University of Iowa, Iowa City, IA, USA*, August 2022.
- [2] Baoyu Zhou. SQP Methods for Inequality Constrained Stochastic Optimization. *International Conference on Continuous Optimization, Bethlehem, PA, USA*, July 2022.
- [3] 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.
- [4] Baoyu Zhou. An Inexact Sequential Quadratic Method For Nonlinear Equality Constrained Stochastic Optimization. *INFORMS Annual Meeting, Anaheim, CA, USA*, October 2021.
- [5] Baoyu Zhou. Manifold Sampling for Optimizing Nonsmooth Nonconvex Compositions. *MOPTA Conference (Virtual), Bethlehem, PA, USA*, August 2021.
- [6] Baoyu Zhou. SQP for Nonlinear Equality Constrained Stochastic Optimization. *MOPTA Conference (Virtual), Bethlehem, PA, USA*, August 2021.

- [7] Baoyu Zhou. SQP Methods for Equality Constrained Stochastic Optimization. *SIAM Conference on Optimization (Virtual)*, Spokane, WA, USA, July 2021.
- [8] Baoyu Zhou. Manifold Sampling for Optimizing Nonsmooth Nonconvex Compositions. *SIAM Conference on Computational Science and Engineering (Virtual)*, Fort Worth, TX, USA, March 2021.
- [9] Baoyu Zhou. Manifold Sampling for Optimizing Nonconvex Piecewise-Smooth Compositions. *INFORMS Annual Meeting (Virtual)*, National Harbor, MD, USA, November 2020.
- [10] Baoyu Zhou. Limited-Memory BFGS with Displacement Aggregation. *INFORMS Annual Meeting*, Seattle, WA, USA, October 2019.
- [11] Baoyu Zhou. Limited-Memory BFGS with Displacement Aggregation. *MOPTA Conference*, Bethlehem, PA, USA, August 2019.

<b>TEACHING EXPERIENCE</b>	<b>Bootcamp Organizer and Instructor</b>	Aug. 2021
	<b>Lehigh University</b> , Bethlehem, PA	
	<b>Teaching Assistant Mentor</b>	Sept. 2014 – Aug. 2016
	<b>Shanghai Jiao Tong University</b> , Shanghai, China	
	<b>Undergraduate Teaching Assistant</b>	
	<b>Shanghai Jiao Tong University</b> , Shanghai, China	
	VV156: Honors Calculus II	Fall 2013, Spring 2014, Fall 2015
	VM240: Intro to Dynamics and Vibrations	Summer 2015
<b>PROFESSIONAL EXPERIENCE</b>	<b>Cost Engineer Intern</b>	Mar. 2016 – May 2016
	<b>Fiat Chrysler Automobiles</b> , Shanghai, China	
	<b>Technical Assistant Intern</b>	Aug. 2015 – Sept. 2015
<b>HONORS &amp; AWARDS</b>	<b>Shenyang Blower Works Group Corporation</b> , Shenyang, China	
	<b>Elizabeth V. Stout Dissertation Award</b> , Lehigh University	2022
	<b>SIAM Student Travel Award</b>	2021
	<b>Van Hoesen Family Best Publication Award</b> , Lehigh ISE Department	2021
	<b>P.C. Rossin Doctoral Fellow</b> , Lehigh University	2021
	<b>Ph.D. Student of the Year</b> , Lehigh ISE Department	2021
	<b>Lehigh University Fellowship</b>	2018 – 2019
	<b>Outstanding Freshman Scholarship</b> , Shanghai Jiao Tong University	2012 – 2016
<b>MENTORSHIP EXPERIENCE</b>	<b>Outstanding Academic Scholarship</b> , Shanghai Jiao Tong University	2015
	<b>Ph.D. Students</b>	
	• Jiahao Shi (University of Michigan)	2021 – present
	<i>co-supervised with Prof. Albert S. Berahas</i>	
	Topics: Algorithms for Constrained Stochastic and Derivative-Free Optimization	
	<b>Undergraduate Students</b>	
	• Zihong Yi (University of Michigan)	2021 – 2022
	<i>co-supervised with Prof. Albert S. Berahas</i>	

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.

### Journals Reviewed for (# of articles reviewed)

- Computational Optimization and Applications (2)
- IEEE Transactions on Automatic Control (1)
- IEEE Transactions on Network Science and Engineering (1)
- IEEE Transactions on Neural Networks and Learning Systems (1)
- 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)
- Mathematical Programming (1)
- Mathematical Programming Computation (1)
- Mathematics of Computation (1)
- Optimization Methods and Software (1)
- SIAM Journal on Optimization (2)

### Conferences Reviewed for (# of articles reviewed)

- 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)

<b>COURSES</b>	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
<b>COMPUTER SKILLS</b>	<b>Programming Language:</b> C/C++, Julia, MATLAB, Python, R <b>Software:</b> AMPL, LINGO, Mathematica, L <sup>A</sup> T <sub>E</sub> X <b>Solver:</b> CPLEX, MOSEK, GUROBI, SEDUMI
<b>LANGUAGES</b>	Mandarin ( <i>native language</i> ), English ( <i>bilingual proficiency</i> )