

Baoyu Zhou

CONTACT INFORMATION	Mohler Lab 358 200 W Packer Avenue Bethlehem, PA 18015	+1 (551) 228-9835 baoyu.zhou@lehigh.edu https://baoyuzhou18.github.io
RESEARCH INTERESTS	Large-scale Nonlinear Optimization, Nonsmooth Optimization, Constrained Stochastic Optimization, Optimization Methods for Machine Learning and Other Applications.	
ACADEMIC POSITIONS	Postdoctoral Researcher University of Chicago , Chicago, IL <i>Booth School of Business</i> Supervisor: Prof. Haihao Lu	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, 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. Defazio, **B. Zhou**, and L. Xiao. Grad-GradaGrad? A Non-Monotone Adaptive Stochastic Gradient Method. arXiv 2206.06900, 2022.
- [6] A. S. Berahas, R. Bollapragada, and **B. Zhou**. An Adaptive Sampling Sequential Quadratic Programming Method for Equality Constrained Stochastic Optimization. arXiv 2206.00712, 2022.
- [7] 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.
- [8] 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.

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

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

TEACHING EXPERIENCE

Bootcamp Organizer	Aug. 2021
Lehigh University , Bethlehem, PA	
Bootcamp Instructor	Aug. 2021
Lehigh University , Bethlehem, PA	
Teaching Assistant Mentor	Sept. 2014 – Aug. 2016
Shanghai Jiao Tong University , Shanghai, China	
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	Mar. 2016 – May 2016
Fiat Chrysler Automobiles , Shanghai, China	
Technical Assistant Intern	Aug. 2015 – Sept. 2015
Shenyang Blower Works Group Corporation , Shenyang, China	

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
Outstanding Academic Scholarship , Shanghai Jiao Tong University	2015

MENTORSHIP EXPERIENCE

Ph.D. Students	
<ul style="list-style-type: none"> • Jiahao Shi (University of Michigan) 2021 – present <i>co-supervised with Prof. Albert S. Berahas</i>	
Topics: Accelerating Stochastic Sequential Quadratic Programming for Equality Constrained Optimization using Predictive Variance Reduction	
Undergraduate Students	
<ul style="list-style-type: none"> • 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.

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)

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++, Python, MATLAB, R Software: AMPL, LINGO, Mathematica, L ^A T _E X Solver: CPLEX, MOSEK, GUROBI, SEDUMI
LANGUAGES	Mandarin (<i>native language</i>), English (<i>bilingual proficiency</i>)