

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	since Aug. 2022 (expected)
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] J. Larson, M. Menickelly, and **B. Zhou**. Manifold Sampling for Optimizing Nonsmooth Non-convex Compositions. *SIAM Journal on Optimization*, 31(4):2638-2664, 2021.
- [2] 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.
- [3] A. S. Berahas, F. E. Curtis, and **B. Zhou**. Limited-Memory BFGS with Displacement Aggregation. *Mathematical Programming*, <https://doi.org/10.1007/s10107-021-01621-6>, 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**. 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

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

- [9] 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
	Shanghai Jiao Tong University Outstanding Freshman Scholarship	2012 – 2016
	Shanghai Jiao Tong University Outstanding Academic Scholarship	2015
MENTORSHIP EXPERIENCE	Ph.D. Students	
	• 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	
	• 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 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)
- Optimization Methods and Software (1)
- SIAM Journal on Optimization (1)

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 AT LEHIGH

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^AT_EX
Solver: CPLEX, MOSEK, GUROBI, SEDUMI

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