CHUAN HE

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EMPLOYMENT

University of Minnesota   Minneapolis, United States
Postdoctoral Associate in Computer Science and Engineering   *Oct 2023 – Present*
    Supervisor: Ju Sun

EDUCATION

University of Minnesota   Minneapolis, United States
Ph.D. in Industrial and Systems Engineering   *Sep 2019 – Sep 2023*
    Advisor: Zhaosong Lu

Xiamen University   Xiamen, China
B.S. in School of Mathematical Sciences   *Sep 2015 – July 2019*
    Supervisor: Wen Huang

RESEARCH INTERESTS

- ⋆ **Data Science:** Federated Learning, Deep Learning, Distributionally Robust Learning.

- ⋆ **Optimization:** Distributed Optimization, Accelerated Methods, High-order Methods.

PUBLICATIONS

Published and Under Review

1. **C. He**, Zhaosong Lu, "A Newton-CG based barrier method for finding a second-order stationary point of nonconvex conic optimization with complexity guarantees", *SIAM Journal on Optimization*, 33(2):1191–1222, 2023.

2. **C. He**, Zhaosong Lu, Ting Kei Pong, "A Newton-CG based augmented Lagrangian method for finding a second-order stationary point of nonconvex equality constrained optimization with complexity guarantees", *SIAM Journal on Optimization*, 33(3):1734-1766, 2023.

3. Akshit Goyal, Yiling Zhang, **C. He**, "Decision rule approaches for pessimistic bilevel linear programs under moment ambiguity with facility location applications", *INFORMS Journal on Computing*, 35(6):1342-1360, 2023.

4. Masaru Ito, Zhaosong Lu, **C. He**, "A parameter-free conditional gradient method for composite minimization under Hölder condition", *Journal of Machine Learning Research*, 24(166):1-34, 2023.

5. **C. He**, Heng Huang, Zhaosong Lu, "A Newton-CG based barrier-augmented Lagrangian method for general nonconvex conic optimization", Under review.

6. **C. He**, Le Peng, Ju Sun, "Federated learning with convex global and local constraints", Under review.

7. **C. He**, Zhaosong Lu, "Newton-CG methods for nonconvex unconstrained optimization under Hölder continuous Hessian", Under review.

8. Le Peng, Yash Travadi, **C. He**, Ying Cui, Ju Sun, "Direct metric optimization for imbalanced classification", Under review.

9. Tiancong Chen, Hengkang Wang, **C. He**, Ying Cui, Ju Sun, "Regression with high-dimensional targets", Under review.

Working papers

1. **C. He**, Ryan Devera, Wenjie Zhang, Ying Cui, Zhaosong Lu, Ju Sun, "Deep learning with nontrivial constraints: Methods and applications", Working in progress.

2. Ryan Devera, **C. He**, Sean Schweiger, Zhong Zhuang, Ju Sun, "Deeplifting: Unconstrained global optimization made easy", Working in progress.

3. **C. He**, Ju Sun, Zhaosong Lu, Shuzhong Zhang, "Federated learning with linearly coupled convex constraints", Working in progress.

CONFERENCE ACTIVITIES

Presentations

1. "Augmented Lagrangian Methods for Constrained Optimization in Machine Learning"
   - *INFORMS Anneal Meeting*, Oct 2023, Phoenix, United States.

2. "Second-order Learning via Newton-CG Based Methods"
   - *Applied Math conference in Shenzhen University Talk*, July 2023, Shenzhen, China.
   - *SIAM Conference on Optimization*, June 2023, Seattle, United States.
   - *Applied Math Seminar in Southern University of Science and Technology*, May 2021, Shenzhen, China.

3. "Decision Rule Approaches for Bilevel Linear Programs"
   - *INFORMS Annual Meeting*, Nov 2020, virtual presentation.

Posters

1. "Federated Learning with Convex Constraints"
   - *NeurIPS OPT Workshop*, Dec 2023, New Orleans, United States.

2. "Novel Algorithms for Nonconvex Second-order Optimization with Performance Guarantees"
   - *FoCM Conference, Continuous Optimization Session*, June 2023, Paris, France.

RESEARCH EXPERIENCE

Research Assistant   *Jan 2022 – Aug 2022*
University of Pittsburgh   Pittsburgh, United States
    Host: Heng Huang

Summer Research Assistant   *May 2021 – Aug 2021*
The Hong Kong Polytechnic University   Hong Kong, China
    Host: Ting Kei Pong

TEACHING EXPERIENCE

Industrial and Systems Engineering University of Minnesota
Teaching Assistant *Sep 2019 – Sep 2023*

    IE 8564: Optimization for machine learning, Fall 2022.

    IE 5533: Operations research for data science, Fall 2022.

    IE 8534: Advanced topics in optimization for machine learning, Fall 2020, 2021.

    IE 5561: Analytics and data-driven decision making, Spring 2021.

    IE 8532: Stochastic process and queuing systems, Fall 2020.

    IE 3522: Quality engineering and reliability, Spring 2020.

    IE 3521: Statistics, quality, and reliability, Fall 2019.