Niao He

School of Industrial and Systems Engineering
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RESEARCH INTERESTS

Fast algorithms and theories for large-scale convex/stochastic/robust/distributed optimization
Applications in finance, machine learning, statistics, and decision-making under uncertainty

EDUCATION

Ph.D. in Operations Research, School of Industrial & Systems Engineering August 2015
Georgia Institute of Technology, Atlanta, Georgia (Expected)

- Dissertation: *Saddle Point Techniques for Multi-Term Composite Minimization and Error-in-Measurement Optimization*
- Advisor: Dr. Arkadi Nemirovski
- Committee: Drs. Alex Shapiro, Shabbir Ahmed, and Maria-Florina Balcan (Carnegie Mellon University)

M.S. in Computational Science and Engineering, College of Computing May 2015
Georgia Institute of Technology, Atlanta, Georgia (Expected)

B.S. in Mathematics and Applied Mathematics, Special Class for the Gifted Young May 2010
University of Science and Technology of China (USTC), Anhui, Hubei, China

ACADEMIC EXPERIENCE

Research at Georgia Institute of Technology, Atlanta, Georgia Fall 2011-present
(Funded by *NSF Grant CMMI-1232623*)

- Explored robust optimization with applications in portfolio selection and machine learning
- Developed first-order algorithms for multi-term composite minimization problems
- Established safe approximations and efficient algorithms for indirect stochastic programming

Teaching at Georgia Institute of Technology, Atlanta, Georgia

- ISyE 6673: Financial Optimization (Instructor: Shabbir Ahmed) Fall 2011-2012
- ISyE 3133: Engineering Optimization (Instructor: Alisha Waller) Summer 2011
- ISyE 6673: Financial Optimization (Instructor: Anureet Saxena) Spring 2011

Project at Georgia Institute of Technology, Atlanta, Georgia Summer 2011

- Implemented several strategies of portfolio selection and analyzed their different performances
- Simulated different risk models and their performances based on the USER database

Internship at Mitsubishi Electric Research Laboratories, Cambridge, Massachusetts Summer 2013

- Established convergence theories for a parallel quadratic programming algorithm
- Implemented dynamic mixed integer programs for IMRT optimization under organ motion

Internship at Microsoft Research Asia, Beijing, China Summer 2009

- Investigated evolution algorithms for graph coding in compressive sensing

PUBLICATIONS

Refereed Journals and Conference Publications

- **Niao He**, Anatoli Juditsky, and Arkadi Nemirovski, "Mirror Prox Algorithm for Multi-Term Composite Minimization and Semi-Separable Problems," *Journal of Computational Optimization and Applications*, accepted with minor revision. E-print: arXiv:1311.1098.
- Bo Dai, Bo Xie, **Niao He**, Yingyu Liang, Anant Raj, Maria-Florina Balcan, and Le Song, "Scalable Kernel Methods via Doubly Stochastic Gradients," *Neural Information Processing Systems*, 2014. [Acceptance rate = 25%] E-print: arXiv:1407.5599.
- Hua Ouyang, **Niao He**, Long Tran, and Alexander Gray, "Stochastic Alternating Direction Method of Multipliers," *Proceedings of the* 30^{th} *International Conference on Machine Learning*, 2013. [Acceptance rate = 24%] E-print: arXiv:1211.0632.

Refereed Workshop Proceedings

- Hua Ouyang, **Niao He**, and Alexander Gray, "Stochastic ADMM for Nonsmooth Optimization," *NIPS 5th International Workshop on Optimization for Machine Learning*, 2012.

Working In Progress

- **Niao He**, Zaid Harchaoui, and Arkadi Nemirovski, "Proximal-free Algorithms for Multi-Term Composite Minimization."
- **Niao He**, Arkadi Nemirovski, "Stochastic Approximation for Convex Optimization Under Measurement Errors."
- Bo Dai, **Niao He**, and Le Song, "Doubly Stochastic Functional Gradient for Bayesian Inference."

PRESENTATIONS

Invited Talks

- IMA Workshop on *Convexity and Optimization: Theory and Applications* — February 2015 (upcoming)
  University of Minnesota, Minneapolis, Minnesota
  Title: Scalable Kernel Methods via Doubly Stochastic Gradients
- INFORMS Annual Meeting session on *Recent Advances in First-Order Methods* — November 2014 (upcoming)
  San Francisco, California
  Title: Mirror Prox Algorithm for Multi-Term Composite Minimization
- Cornell ORIE Workshop on *Data-Driven Decision Making* — October 2014
  Cornell University, Ithaca, New York
  Title: Mirror Prox Algorithm for Multi-Term Composite Minimization
- INFORMS Optimization Society Conference on *Theory and Practice: Dealing with Big Data and Other Challenges*, Rice University, Houston, Texas — March 2014
  Title: Mirror Prox Algorithm for Multi-Term Composite Minimization

HONORS AND AWARDS

Kiplinger Fellowship, Georgia Institute of Technology	2010-2012
Outstanding Thesis Award, USTC	Summer 2010
National Scholarship (awarded to the top 1% students), USTC	2009-2010
Huawei Fellowship (awarded to the top 2% students), USTC	2008-2009

AFFILIATIONS AND PROFESSIONAL SERVICE

Member

- Institute for Operations Research and Management Sciences (*INFORMS*)

Reviewer

- *Journal of Computational Optimization and Applications*
- *Journal of Optimization Theory and Applications*
- *International Conference on Machine Learning*

COMPUTATIONAL SKILLS

- Expertise in MATLAB, CVX, GAMS, Mathematica
- Proficiency in R, Python, C++, SAS
- Basic knowledge of Windows/Linux Operating System

COURSEWORK

Optimization
Linear Optimization, Discrete Optimization, Nonlinear Optimization, Advanced Nonlinear Programming, Theory of Linear Inequality, and Convex Geometry

Stochastics & Statistics
Stochastic Processes, Advanced Stochastic Programming, Stochastic Optimization, Simulation Theory and Methods, Multivariate Data Analysis, and High-Dimensional Probability

Computational Science
Computational Science and Engineering Algorithms, Computational Data Analysis, Machine Learning Theory, Numerical Linear Algebra, and Fast Linear Algebra

REFERENCES

(References available upon request)