WEIWEI "WILLIAM" KONG

CURRICULUM VITAE

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RESEARCH INTERESTS

Nonconvex Optimization, Convex Optimization, Accelerated First-Order Methods, Proximal Point Methods, Constrained Optimization, Optimization Algorithms, Computational Complexity, Variational Methods, Optimization Software, Min-Max Optimization

EDUCATION

2021 **Ph.D.** in Operations Research (Expected)
Georgia Institute of Technology, Atlanta GA, US

Dissertation Title: Accelerated Inexact First-Order Methods For Solving Nonconvex Composite Optimization Problems

Advisor: Renato D.C. Monteiro

2019 **M.Sc.** in Computational Science and Engineering
Georgia Institute of Technology, Atlanta GA, US

2014 **B.Math.** in Mathematical Finance
University of Waterloo, Waterloo ON, Canada

PUBLICATIONS

Refereed Journal Articles

Kong, W., Melo, J. G., & Monteiro, R. D. (2019). Complexity of a quadratic penalty accelerated inexact proximal point method for solving linearly constrained nonconvex composite programs. *SIAM Journal on Optimization*, 29(4), 2566-2593.

Kong, W., Melo, J. G., & Monteiro, R. D. (2020). An efficient adaptive accelerated inexact proximal point method for solving linearly constrained nonconvex composite problems. *Computational Optimization and Applications*, 76(2), 305-346.

Conference Proceedings

Kong, W., Liaw, C., Mehta, A., & Sivakumar, D. (2018, September). A new dog learns old tricks: RL finds classic optimization algorithms. In *International Conference on Learning Representations*.

Kong, W., Krichene, W., Mayoraz, N., Rendle, S., & Zhang, L. (2020, December). Rankmax: An Adaptive Projection Alternative to the Softmax Function. (Accepted for publication in *Advances in Neural Information Processing Systems 33: Proceedings of the 2020 Conference*).

Manuscripts in Submission

Kong, W., & Monteiro, R. D. (2019). An accelerated inexact proximal point method for solving nonconvex-concave min-max problems. *arXiv preprint arXiv: 1905.13433*. (Submitted to *SIAM Journal on Optimization*)

Kong, W., & Monteiro, R. D. (2020). Accelerated Inexact Composite Gradient Methods for Nonconvex Spectral Optimization Problems. *arXiv preprint arXiv: 2007.11772*. (Submitted to *Journal of Machine Learning Research*)

Kong, W., Melo, J. G., & Monteiro, R. D. (2020). Iteration-complexity of a proximal augmented Lagrangian method for solving nonconvex composite optimization problems with nonlinear convex constraints. *arXiv preprint arXiv: 2008.07080* (Submitted to the *Mathematics of Operations Research*).

PRESENTATIONS

2020 Accelerated Inexact Composite Gradient Methods For Solving Nonconvex Spectral Optimization Problems, Contributed Talk*, INFORMS 2020 Annual Meeting*

Rankmax: An Adaptive Projection Alternative to the Softmax Function, Invited Poster Presentation*, NEURIPS 2020*

2019 Solving Nonconvex-Concave Min-Max Problems, Invited Workshop Talk*, INFORMS 2019 Annual Meeting*

A New Dog Learns Old Tricks: RL Finds Classic Optimization Algorithms, Invited Poster Presentation*, ICLR 2019*

2018 Nonconvex Optimization: Accelerating First-Order Methods, Contributed Talk, *ISyE 2018 Discrete Optimization Seminar*

Nonconvex Optimization: Accelerating First-Order Methods, Contributed Talk, *ISyE 2018 Ph.D. Student Seminar*

HONORS AND AWARDS

2020 IDEaS-TRIAD Research Scholarship, *Georgia Institute of Technology*

2019 Travel Award*, Georgia Institute of Technology*

2019 Travel Award*, ICLR*

2018 – 2020 Alexander Graham Bell Postgraduate Scholarship, $63,000 (Canadian), *Natural Sciences and Engineering Research Council of Canada*,

2016 – 2017 Thomas Johnson Fellowship*,* $6,000*, Georgia Institute of Technology,*

2010 – 2014 Queen Elizabeth II Aiming for the Top Scholarship*, Government of Canada*

RESEARCH EXPERIENCE

2016 – 2020 **Graduate Research Assistant**
Georgia Institute of Technology

Research Areas:

» *Practical Algorithms*: The implementation of optimization algorithms for use in real-world applications.

» *Optimization Theory*: The use of mathematical and algorithmic theory for analyzing optimization algorithms.

Teaching Experience

2016 – 2020 **Head Graduate Teaching Assistant**
Georgia Institute of Technology

Courses:

» Deterministic Optimization (2018, 2020), Graduate level, 20+ students.
» Nonlinear Optimization (2019), Ph.D. level, 20+ students.
» Linear Optimization (2017, 2018), Ph.D. level, 20+ students.
» Applied Probability (2016), Undergraduate level, 50+ students.

2014 **Undergraduate Teaching Assistant**
University of Waterloo

Courses:

» Applied Real Analysis (2014), Undergraduate level, 85+ students.

Administrative Experience

2014 **President**
University of Waterloo's Mathematical Finance Student Association

Responsibilities:

» Organize elections, council meetings, and academic workshops.
» Draft and present funding proposals for the student government.

2013 – 2014 **Vice-President of Finance**
University of Waterloo's Mathematical Finance Student Association

Responsibilities:

» Draft funding proposals for the student government and approve expenses.

Professional Experience

2019 **Research Intern @ Google Research**
Google LLC, Mountain View CA, USA

Published a paper in *NEURIPS 2020* on optimization theory and classification.

2018 **Software Engineering Intern @ Google Research**
Google LLC, Mountain View CA, USA

Published and presented a paper in *ICLR 2019* on using reinforcement learning to solve difficult online optimization problems.

2013 – 2017 **Senior Risk Modeling Analyst**
TD Bank Financial Group, Toronto ON, Canada

Pioneered a new logistic regression variable selection method based on mutual information and variable effect maximization.

TECHNICAL SKILLS

Software Development	Experienced with designing and writing software packages in MATLAB. For reference, see nc-opt.readthedocs.io.
Programming Languages	Working knowledge of MATLAB, C++, Python, Gurobi, and TensorFlow. Some knowledge of Julia, R, SAS, Haskell, UNIX, Condor, and SQL. For reference, see github.com/wwkong.
Markup and Typesetting	Proficient with LaTeX and reStructuredText. For reference, see nc-opt.readthedocs.io and wwkong.github.io/notes.html.

PROFESSIONAL MEMBERSHIPS

Since 2020	Student Member, *INFORMS*
Since 2018	Student Member, *SIAM*
	Student Member, *SIAG Group on Optimization*
	Student Member, *SIAG on Computational Science and Engineering*