

Benjamin Grimmer

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RESEARCH INTERESTS

Machine learning, first-order optimization algorithms, and nonsmooth nonconvex optimization theory.

EDUCATION

Cornell University, Ithaca, NY August, 2016 – Present
PhD in Operations Research and Information Engineering
Advisors: James Renegar and Damek Davis

Illinois Institute of Technology, Chicago, IL May, 2016
M.S. in Computer Science GPA: 4.00/4.0

Illinois Institute of Technology, Chicago, IL May, 2016
B.S. in Computer Science with a Minor in Applied Mathematics GPA: 3.95/4.0

PUBLICATIONS UNDER REVIEW

“Limiting Behaviors of Nonconvex-Nonconcave Minimax Optimization via Continuous-Time Systems”
Benjamin Grimmer, Haihao Lu, Pratik Worah, Vahab Mirrokni.

“The Landscape of Nonconvex-Nonconcave Minimax Optimization”
Benjamin Grimmer, Haihao Lu, Pratik Worah, Vahab Mirrokni.

“A Simple Nearly-Optimal Restart Scheme For Speeding-Up First Order Methods”
James Renegar, **Benjamin Grimmer**. Submitted to Foundations of Computational Mathematics.

JOURNAL PUBLICATIONS

“Proximally Guided Stochastic Subgradient Method for Nonsmooth, Nonconvex Problems”
Damek Davis, **Benjamin Grimmer**. *SIAM Journal on Optimization* (2019), 29(3), 1908–1930.

“Convergence Rates for Deterministic and Stochastic Subgradient Methods without Lipschitz Continuity”
Benjamin Grimmer. *SIAM Journal on Optimization* (2018), 29(2), 1350–1365.

“Radial Subgradient Method”
Benjamin Grimmer. *SIAM Journal on Optimization* (2018), 28(1), 459–469.

“Dual-Based Approximation Algorithms for Cut-Based Network Connectivity Problems”
Benjamin Grimmer. *Algorithmica* (2018) 80: 2849–2873.

“Improved Approximation Algorithms for Single-Tiered Relay Placement”
Gruia Calinescu, **Benjamin Grimmer**, Satyajayant Misra, Sutep Tongngam, Guoliang Xue, Weiyi Zhang.
Journal of Combinatorial Optimization (2016) 31: 1280–1297.

CONFERENCE PUBLICATIONS

“Nash Equilibrium and the Price of Anarchy in Priority Based Network Routing”
Benjamin Grimmer, Sanjiv Kapoor. *IEEE Conference on Computer Communications*, INFOCOM 2016.

“Near Linear Time 5/3-Approximation Algorithms for Two-Level Power Assignment Problems”
Benjamin Grimmer, Kan Qiao. In *Proceedings of the 10th ACM International Workshop on Foundations of Mobile Computing*, FOMC 2014.

“Design and Evaluation of the GeMTC Framework for GPU-enabled Many-Task Computing”
Scott J. Krieder, Justin M. Wozniak, Timothy Armstrong, Michael Wilde, Daniel S. Katz, **Benjamin Grimmer**, Ian T. Foster, Ioan Raicu. In *Proceedings of the 23rd International ACM Symposium on High Performance Parallel and Distributed Computing*, HPDC 2014.

WORKSHOP PAPERS AND TECHNICAL REPORTS

“Bundle Method Sketching for Low Rank Semidefinite Programming”
Lijun Ding, **Benjamin Grimmer**. OPT-ML 2019.

“General Convergence Rates Follow From Specialized Rates Assuming Growth Bounds”
Benjamin Grimmer.

PATENTS

“Analytics for application programming interfaces”.
Qian Zhu, Teresa Tung, **Benjamin Grimmer**.

United States Patent: 9,146,787.
Filed November 2013, issued September 2015.

TALKS

The Landscape of Bilinear Minimax Optimization

- IIT Discrete Math Seminar, Chicago, IL October 2020

Radial Duality

- INFORMS Annual Meeting, Seattle, WA October 2019
- RPI Applied Math Days, Troy, NY April 2019

General Convergence Rates Follow From Specialized Rates Assuming Growth Bounds

- INFORMS Annual Meeting, Seattle, WA October 2019

Convergence Rates For Stochastic Subgradient Methods Without Lipschitz Continuity Or Convexity

- International Symposium on Mathematical Programming, Bordeaux, France July 2018
- INFORMS Optimization Society, Denver, CO March 2018

Radial Subgradient Method

- INFORMS Annual Meeting, Houston, TX October 2017
- SIAM Conference on Optimization, Vancouver, Canada May 2017

TEACHING

Instructor

- ORIE 3300 (Undergrad): Optimization I, Summer 2020 Cornell University
- ORIE 5270, 6125 (joint Masters and PhD): Big Data Technology and Computational Methods in Operations Research, Spring 2019 Cornell University

Teaching Assistant

- ORIE 6300 (PhD): Mathematical Programming I, Fall 2019 Cornell University
- CS 330 (Undergrad): Discrete Structures, Spring 2015 Illinois Institute of Technology

INDUSTRY EXPERIENCE

Research Intern

Spring 2020

Google Research, New York, NY

- Worked on solving nonconvex-nonconcave minimax optimization problems relevant to modern machine learning applications like GANs, Reinforcement learning, and robust optimization.
- Resulting in two papers on minimax optimization.

Software Architecture Intern

Summer 2013

Accenture Technology Labs, San Jose, CA

- Built a prototype system to log and data mine common patterns from web API traffic.
- Resulting system and methods have since been patented.

AWARDS, HONORS

Received National Science Foundation Graduate Research Fellowship, 2017.

Competed in ACM-ICPC (team-based programming competition):

- Honorable Mention at the ACM-ICPC 2016 World Finals in Phuket, Thailand.
- Competed in the Mid-Central Regional Competition from 2012 to 2015 placing 9th, 6th, 4th, and 3rd (approximately 120 teams competed each year).