

Alex L. Wang

Curriculum Vitae

February 20, 2026

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ACADEMIC POSITIONS

Purdue University Jan. 2023–present
Assistant Professor in Daniels School of Business, Quantitative Methods

Centrum Wiskunde & Informatica July 2022–Dec. 2022
Postdoctoral Researcher
Advisor: Monique Laurent

EDUCATION

Carnegie Mellon University Sept. 2017–June 2022
Ph.D., Computer Science
Advisor: Fatma Kılınç-Karzan
Thesis: On semidefinite program relaxations of quadratically constrained quadratic programs

Northwestern University Sept. 2013–June 2017
B.S., Double Major Computer Science, Mathematics
Honors: *summa cum laude*

PUBLICATIONS

Articles under review

Optimal Subgradient Methods for Lipschitz Convex Optimization with Error Bounds
A. L. Wang

Subgame Perfect Methods in Nonsmooth Convex Optimization
(α) B. Grimmer and A. L. Wang

Beyond minimax optimality: A subgame perfect gradient method
(α) B. Grimmer, K. Shu, and A. L. Wang

Sharpness and well-conditioning of nonsmooth convex formulations in statistical signal recovery
(α) L. Ding and A. L. Wang

Journal publications

Composing optimized stepsize schedules for gradient descent
(α) B. Grimmer, K. Shu, and A. L. Wang *Math. Oper. Res.* 2025

Accelerated objective gap and gradient norm convergence for gradient descent via long steps
(α) B. Grimmer, K. Shu, and A. L. Wang *INFORMS J. Optim.* 2025

New notions of simultaneous diagonalizability of quadratic forms with applications to QCQPs
A. L. Wang and R. Jiang *Math. Prog.* 2024

Hidden convexity and algorithms in constrained optimization over the rotation group
(α) A. Ramachandran, K. Shu, and A. L. Wang *Math. Oper. Res.* 2024

On semidefinite descriptions for convex hulls of quadratic programs
A. L. Wang and F. Kılınç-Karzan *Oper. Res. Letters* 2024

Accelerated first-order methods for a class of semidefinite programs
A. L. Wang and F. Kılınç-Karzan *Math. Program.* 2024

(α) indicates alphabetical author order

Implicit regularity and linear convergence for the generalized trust-region subproblem
A. L. Wang and Y. Lu and F. Kılınç-Karzan *SIAM J. Optim.* 2023

Necessary and sufficient conditions for rank-one generated cones
(α) C. Argue, F. Kılınç-Karzan, and A. L. Wang *Math. Oper. Res.* 2021

Exactness in SDP relaxations of QCQPs: Theory and applications
(α) F. Kılınç-Karzan and A. L. Wang *Tut. in Oper. Res.* 2021

On the tightness of SDP relaxations of QCQPs
A. L. Wang and F. Kılınç-Karzan *Math. Program.* 2021

Winner of INFORMS Optimization Society's 2021 Student Paper Prize

The generalized trust region subproblem: Solution complexity and convex hull results
A. L. Wang and F. Kılınç-Karzan *Math. Program.* 2020

Refereed conference proceedings

Solving Stackelberg prediction games with least squares loss via spherically constrained least squares reformulation
J. Wang and W. Huang and R. Jiang and X. Li and A. L. Wang *Int. Conf. on Machine Learning (ICML)* 2022

Winner of ICML 2022 Outstanding Paper Award (1 of 10 winning papers)

On convex hulls of epigraphs of QCQPs
A. L. Wang and F. Kılınç-Karzan *Integer Program. and Comb. Optim. (IPCO)* 2020

Hardy-Muckenhoupt bounds for Laplacian eigenvalues
(α) G. L. Miller, N. J. Walkington, and A. L. Wang *Approx. Algorithms for Comb. Optim. Prob. (APPROX)* 2019

Clustering stable instances of Euclidean k -means
(α) A. Dutta, A. Vijayaraghavan, and A. L. Wang *Adv. in Neural Inf. Process. Syst. (NeurIPS)* 2017

TALKS

Subgame Perfect Algorithms for Smooth Convex Optimization
Brown CS Theory Seminar, *Providence, RI* Nov. 2025
INFORMS Annual Meeting, *Atlanta, GA* Oct. 2025
Process Systems Engineering (PSE) Seminar, *West Lafayette, IN* Oct. 2025
SINE Seminar, *Champaign, IL* Oct. 2025

Some Accelerated Methods for Smooth Convex Minimization
Daniels School of Business Quantitative Methods Seminar, *West Lafayette, IN* Sept. 2025

Composing Optimized Stepsize Schedules for Gradient Descent
ICCOPT (Int. Conf. on Continuous Optim.), *Los Angeles, CA* Jul. 2025

Hidden convexity, optimization, and algorithms on rotation matrices
International Symposium on Mathematical Programming, *Montréal, Canada* July 2024

New first-order methods in modern/classical settings
The University of Sydney Business School Research Seminar, *Sydney, Australia* Nov. 2023
Daniels School of Business Quantitative Methods Seminar, *West Lafayette, IN* Sept. 2023

Sharp exact penalty formulations in signal recovery
INFORMS Annual Meeting, *Phoenix, AZ* Oct. 2023
ICIAM23 (Int. Congr. on Ind. and Appl. Math.), *Tokyo, Japan* Aug. 2023

Accelerated first-order methods for a class of semidefinite programs
OP23 (SIAM Conf. on Optim.), *Seattle, WA* May. 2023
Workshop on semidefinite and polynomial optimization, *Amsterdam, Netherlands* Aug. 2022
ICCOPT (Int. Conf. on Continuous Optim.), *Bethlehem, PA* July 2022
Networks and Optimization Seminar, Centrum Wiskunde & Informatica, *Online* Feb. 2022

Accurately and efficiently solving structured nonconvex optimization problems	
ISE, University of Illinois Urbana-Champaign, <i>Online</i>	Mar. 2022
Quantitative Methods, Purdue University Krannert School of Business, <i>West Lafayette, IN</i>	Jan. 2022
Mathematics of Data & Decisions Seminar, UC Davis, <i>Online</i>	Jan. 2022
Argonne National Laboratory, <i>Online</i>	Jan. 2022
CAAM Colloquium, Rice University, <i>Houston, TX</i>	Dec. 2021
Exactness in SDP relaxations of QCQPs: Theory and applications	
INFORMS Annual Meeting, <i>invited tutorial talk, Anaheim, CA</i>	Oct. 2021
New notions of simultaneous diagonalizability of quadratic forms	
INFORMS Annual Meeting, <i>Anaheim, CA</i>	Oct. 2021
MOPTA (Model. and Optim.: Theory and Appl.), <i>Online</i>	Aug. 2021
CMU Theory Lunch, <i>Online</i>	Apr. 2021
A geometric treatment of SDP exactness in QCQPs and its applications	
INFORMS Annual Meeting, <i>Online</i>	Nov. 2020
Exactness in semidefinite programming	
CMU ChemE Seminar, <i>Online</i>	Oct. 2020
CMU Theory Lunch, <i>Online</i>	Sept. 2020
On convex hulls of epigraphs of QCQPs	
IPCO (Conf. on Integer Programming and Comb. Optim.), <i>Online</i>	June 2020
Sufficient conditions for exact SDP reformulations of QCQPs	
INFORMS Annual Meeting, <i>Anaheim, CA</i>	Oct. 2021
OP20 (SIAM Conf. on Optim.), <i>canceled due to COVID-19</i>	May 2020
IOS (INFORMS Optim. Soc. Conf.), <i>canceled due to COVID-19</i>	Mar. 2020
INFORMS Annual Meeting, <i>Seattle, WA</i>	Oct. 2019
Hardy-Muckenhoupt bounds for Laplacian eigenvalues	
APPROX (Int. Workshop on Approx. Algorithms for Comb. Optim. Prob.), <i>Boston, MA</i>	Sept. 2019
CMU Theory Lunch, <i>Pittsburgh, PA</i>	May 2019
A linear-time algorithm for generalized trust region subproblem based on a convex quadratic reformulation	
ICCOPT (Int. Conf. on Continuous Optim.), <i>Berlin, Germany</i>	Aug. 2019

TEACHING

Purdue University

MGMT 573 – Optimization Modeling with Spreadsheets	Spring 2025-2026
MGMT 690 – Convex Optimization	Spring 2024
MGMT 306 – Management Science	Spring 2023–2026

Carnegie Mellon University (as Teaching Assistant)

45751 – Optimization	Spring 2021
15850 – Advanced Algorithms	Fall 2020
47851 – Modern Convex Optimization	Spring 2020

Northwestern University (as Teaching Assistant)

Mathematical Foundations of CS	Fall 2016
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HONORS AND AWARDS

SIAM Travel Award – ICIAM	Aug. 2023
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ICML 2022 Outstanding Paper Award (1/10)	July 2022
<i>Solving Stackelberg prediction games with least squares loss via a spherically constrained least squares reformulation</i>	

CMU Graduate Student Service Award	Mar. 2022
Group award for development of <i>DEI in Computer Science and Society</i> course	

INFORMS Optimization Society Best Student Paper Award	Aug. 2021
<i>On the tightness of SDP relaxations of QCQPs</i>	

summa cum laude , Northwestern University Awarded to the top 5% of the graduating class	June 2017
Outstanding Senior in CS (1/2) , Northwestern University	June 2017
Tau Beta Pi Engineering Honor Society	Nov. 2015

PROFESSIONAL ACTIVITIES

Journal and conference reviewing

INFORMS J. Optim., IPCO, J. Optim. Theory Appl., Math. Oper. Res., Math. Prog., Oper. Res. Optim. Lett., SIAM J. Optim.

INFORMS Annual Meeting, Session co-organizer
Novel First-order Methods via Performance Estimation Programming Oct. 2024

International Symposium on Mathematical Programming 2024, Session co-organizer
The interplay between optimization, statistics and machine learning I, II July 2024

INFORMS Optimization Society Conference, Session co-organizer
Recent advances in semidefinite programming March 2024

INFORMS Annual Meeting, Session co-organizer
The interplay between learning, optimization, and statistics Oct. 2023

SIAM Conference on Optimization, Minisymposium co-organizer
Advances in optimal storage semidefinite programming May. 2023

INFORMS Annual Meeting, Session co-organizer(joint with F. Kılınç-Karzan)
Recent developments in semidefinite programming Oct. 2021

INFORMS Annual Meeting, Session co-organizer
Advances in nonconvex quadratic programs and their relaxations Nov. 2020

SIAM Conference on Optimization, Minisymposium co-organizer
Recent advances in structure in semidefinite programs May 2020 (*anceled-COVID*)

INFORMS Optimization Society Conference, Session co-organizer
Semidefinite Programming: Theory and Algorithms Mar. 2020 (*anceled-COVID*)

DEPARTMENTAL SERVICE

Purdue University

Quantitative Methods Faculty Search Committee Spring 2024
Ph.D. Admissions Committee Spring 2023-2026

Carnegie Mellon University

Graduate Student Teaching Award Committee Feb. 2022
Graduate Student Ombudsperson May 2020–May 2022
Doctoral Review Committee, Graduate Student Member May 2020–May 2022
DEI in Computer Science and Society Course, Working Group Sept. 2020–Jan. 2021

ADVISING AND MENTORING

Ph.D. Thesis committee

Marcelo Cruz de Souza, Purdue University, Daniels School of Business Summer 2024
Yao Ji, Purdue University, Industrial Engineering Summer 2024

Student collaborators

Yunlei Lu (Undergraduate, Peking University)

Jan. 2021–Feb. 2023

Implicit regularity and linear convergence for the generalized trust-region subproblem (*SIAM J. Optim.* 2023)

First placement: Master of Scientific Computing program, Courant Institute of Mathematical Sciences, NYU

PROFESSIONAL AFFILIATIONS

SIAM (Society for Industrial and Applied Mathematics), Member

INFORMS (Institute for Operations Research and the Management Sciences), Member

MOS (Mathematical Optimization Society), Member