

Anthony Karahalios

PhD Candidate in Algorithms, Combinatorics, and Optimization
Carnegie Mellon University

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Curriculum Vitae

Education

Carnegie Mellon University, Pittsburgh, PA

- Ph.D. Algorithms, Combinatorics, and Optimization Spring 2025 (expected)
- M.S. Algorithms, Combinatorics, and Optimization 2022

Johns Hopkins University Whiting School of Engineering, Baltimore, MD

- B.S. Applied Mathematics and Statistics 2017

Research and Teaching Interests

Methodologies: Integer Programming, Dynamic Programming, Decision Diagrams

Applications: Transportation, Scheduling, Warehouse Operations

Publications

Published Works

- A. Karahalios, S. Tayur, A. Tenneti, A. Pashapour, FS Salman, B Yıldız. A Quantum Inspired Bi-level Optimization Algorithm for the First Responder Network Design Problem. *INFORMS Journal on Computing*, to appear, 2024.
- A. Karahalios and W.-J. van Hoeve. Column Elimination for Capacitated Vehicle Routing Problems. In *Proceedings of CPAIOR*, 1 volume 13884 of LNCS, pp. 35–51. Springer, 2023.
- M. J. H. Heule, A. Karahalios, and W.-J. van Hoeve. From Cliques to Colorings and Back Again. In *Proceedings of CP*, 2 LIPICS 235, pp. 26:1–26:10, 2022.
- A. Karahalios and W.-J. van Hoeve. Variable Ordering for Decision Diagrams: A Portfolio Approach. *Constraints* 27:116–133, 2022.

Submitted Works

- A. Karahalios and W.-J. van Hoeve. Column Elimination: An Iterative Approach to Solving Integer Programs. *Submitted to Operations Research*, 2024.

Working Papers

- A. Karahalios and W.-J. van Hoeve. Cutting Planes for Column Elimination.
- G. Cornuéjols, A. Karahalios, and V. Patil. A Dyadic Linear Programming Solver.
- A. Karahalios, I. Erazo, and K. Zheng. A Column Generation Approach to Solving Multi-Objective Picking Problems.

Teaching

Carnegie Mellon University

- Instructor 70-460 Mathematical Models for Consulting (Undergrad) Rating: 4.78/5, Fall 2022
- Guest Lecturer 21-292 Operations Research I (Undergrad) Spring 2023, 2024
- Guest Lecturer 70-257 Optimization for Business (Undergrad) Fall 2022
- TA 46-888 Optimization for Prescriptive Analytics (Online MSBA) Summer 2022, 2023
- TA 45-751 Optimization (MBA) Spring 2022
- TA Math Bootcamp (MBA) Summer 2021

Johns Hopkins University

- TA 550.171 Discrete Mathematics (Undergrad) Fall 2015, Spring 2016, Fall 2016
- TA 550.420 Intro to Probability (Undergrad) Spring 2017

Work Experience

Amazon Seattle, Washington	2024
Research Scientist Intern - Solving human-robot picking problems in fulfillment centers	
Upwork Pittsburgh, Pennsylvania	2020-2024
Freelancer - Consulting for companies such as LogixHealth, Freeline, Sunlife Insurance	
Marshall Wace Asset Management New York City, New York	2017-2020
Quantitative Software Developer - Optimizing order routing and custodian management	
Johns Hopkins Department of Applied Math and Statistics Baltimore, Maryland	2015-2017
Operations Research Consultant - Creating umpire schedules for Minor League Baseball	

Service

Conferences and Journals

- Session Chair (INFORMS Annual Meeting) 2022, 2023, 2024
- Conference Chair, Sponsorship Chair (YinzOR) 2022, 2023, 2024
- Reviewer for INFORMS Journal on Computing (2023, 2024), International Transactions in OR (2024), Constraint Programming (2022, 2024), CPAIOR (2021)

CMU INFORMS Student Chapter

- President, Vice-President 2021, 2022
- Podcast Host (Optimizing You) 2022-2024

Marshall Wace Charity Committee

- MW Charity Committee Member 2019-2020
- All Stars Project Youth Leadership Board 2019-2020

Mentoring

Joe Wang (Math Undergrad) - Relaxations for the Travelling Tournament Problem 2023

Skills

Software: C++, Python, MATLAB, R, Julia — Linux — SQL, KDB/Q — Dask, Flask
Optimization Software: Mosek, Gurobi, PuLP, CPLEX, XPRESS, BaPCod

Honors & Awards

CPAIOR Best Student Paper	2023
IPCO Best Poster Honorable Mention	2023
NSF Graduate Research Fellowship	2022
CMU Tepper Egon Balas Fellowship	2020
JHU Applied Mathematics and Statistics Achievement Award	2017
JHU Professor Joel Dean Award for Excellence in Teaching (TA)	2016, 2017
JHU Mathematical Modeling Prize	2016, 2017
Sigma Chi International Balfour Award Finalist	2017

Interests

Thoroughbred Handicapping — Poetry — Dance — Trivia — Chess