Anthony Karahalios
PhD Candidate in Algorithms, Combinatorics, and Optimization
Carnegie Mellon University   October 2024

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 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.
- 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. *Accepted to INFORMS Journal on Computing*, 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