

Ari Smith

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Professional Summary

I am a Ph.D. candidate in Industrial and Systems Engineering at the University of Wisconsin, Madison, working in Prof. Justin Boutilier's [Analytics for Human Development](#) lab, currently seeking a teaching-stream faculty position starting in the Summer/Fall 2025. My teaching and research experience encompass the overlap of applied machine learning, optimization modeling (particularly inverse optimization), and applications focused on societal impact and fairness.

Teaching Experience

Course Development

- Machine Learning in Action, online course for Interdisciplinary Professional Program, Masters in Engineering Data Analytics Summer-Fall 2024

Principal Instructor (Student Lecturer)

- ISyE 521, Machine Learning in Action for Industrial Engineers Fall 2023, 2024
- ISyE 521, Machine Learning in Action for Industrial Engineers (online) planned Spring 2025

Teaching Assistant

- ISyE 417, Health Systems Engineering Spring 2023
- ISyE 521, Machine Learning in Action for Industrial Engineers Fall 2022, 2021, 2020
- ISyE 210, Introduction to Industrial Statistics Fall 2022
- ISyE 323, Operations Research Deterministic Models Spring 2022

Additional Experience and Affiliations

Honorary Appointee, UW Madison School of Medicine and Public Health, Emergency Medicine

August 2020 - Present

Data Science Intern at UW Health Enterprise Analytics

February 2022 - January 2024

Contractor at UW Health Enterprise Analytics

August 2020 - February 2022

Academic Papers

Published

- Ari Smith, Brian Patterson, Michael Pulia, John Mayer, Rebecca Schwei, Radha Nagarajan, Frank Liao, Manish Shah, and Justin Boutilier. "[Multisite Evaluation of Prediction Models for Emergency Department Crowding Before and During the COVID-19 Pandemic](#)". Journal of the American Medical Informatics Association (JAMIA), Volume 30, Issue 2, February 2023, Pages 292–300.

Under Review

- Ari Smith and Justin Boutilier. "[Gap-gradient methods for solving generalized mixed integer inverse optimization: an application to political gerrymandering](#)," 2024.

Manuscripts in Progress

- Ari Smith and Justin Boutilier. "Using Inverse Optimization to Detect Biased Training Sets in Machine Learning Predictors."
- Justin Boutilier, Ari Smith, Yonatan Mintz, Christian Elliot, Matthew Zuraw, and Nicole Werner. "A recommender system for caregivers of individuals with Alzheimer's and related dementias."
- Ari Smith. "Preference across power: Algorithmic (Infra)structurings of the Preferring Subject."

Conference Presentations

- Ari Smith (presenting author), Justin Boutilier. “Inverse Mixed Integer Optimization as a Diagnostic for Political Gerrymandering”. 2022 INFORMS annual meeting. October 18, 2022.
- Ari Smith (presenting author), Justin Boutilier, Frank Liao, Brian Patterson, Michael Pulia, and Manish Shah. “Predicting Emergency Department Surges for Last-Minute Actionability”. 2021 INFORMS annual meeting. October 26, 2021.

Skills

Python | Gurobi | scikit-Learn | QGIS | LaTeX | French reading comprehension

Education

Ph.D, Industrial and Systems Engineering

University of Wisconsin, Madison

Doctoral Minor in Science and Technology Studies

Expected Spring 2025

B.A., Mathematics

Oberlin College

Minor in Computer Science

2019

B.Mus., Jazz Bass Performance

Oberlin Conservatory

2019