

KATHERINE MAYO

ARTIFICIAL INTELLIGENCE (AI) RESEARCHER

kamayo@umich.edu | kmayo.com | Ann Arbor, MI

RESEARCH INTERESTS

[AI]: computational economics, multi-agent systems, empirical game theory, applications of machine learning

[Finance]: real-time payments, fraud, systemic risk

EDUCATION

University of Michigan Ann Arbor

PHD IN COMPUTER SCIENCE & ENGINEERING

Ann Arbor, MI

Sept 2019 – Present

- Advised by Michael P. Wellman
- Committee Members: Peter Adriaens, Atul Prakash, Jeffery Zhang
- Dissertation: A Strategic Agent-Based Analysis of Economic and Technological Changes in Financial Networks

University of Michigan Ann Arbor

MS IN COMPUTER SCIENCE & ENGINEERING

Ann Arbor, MI

Sept 2019 – June 2021

- Relevant Coursework: Electronic Commerce (now Incentives and Strategic Behavior in Computational Systems); Advanced Data Mining; International Finance; Reinforcement Learning Theory; Advanced Artificial Intelligence

University of Massachusetts Amherst

BS COMPUTER SCIENCE, BA ECONOMICS, MINOR IN CHINESE

Amherst, MA

Sept 2015 – Feb 2019

- Graduate level coursework: Introduction to Natural Language Processing, Neural Networks: A Modern Introduction
- Awards: *cum laude* and Commonwealth Honors College
- Honors Thesis: Predicting Unemployment Rates Using Google Trends Data (advised by Brendan O'Connor and Arindrajit Dube)

PROFESSIONAL EXPERIENCE

University of Michigan, Computer Science & Engineering Department

GRADUATE STUDENT RESEARCH ASSISTANT – STRATEGIC REASONING GROUP

Ann Arbor, MI

Sept 2019 – Present

- Reason about strategic decision making in agent-based models of financial networks using empirical game-theoretic analysis (EGTA)
- Analyze the effects of strategic decisions on network participants

Michigan Medicine, Department of Radiation Oncology

RESEARCH ASSISTANT

Ann Arbor, MI/Remote

Feb 2019 – Aug 2019

- Analyzed more than 15 factors in a data set of adult cancer patients as possible predictors of emergency room (ER) visits
- Applied random forest, logistic regression, support vector machines, and naive Bayes models to predict ER visits

Systems & Technology Research
INTELLIGENCE TOOLS AND ANALYTICS INTERN

Woburn, MA
Jun 2018 – Aug 2018

- Identified users of interest (UOI) based on analysis of social media usage patterns
- Applied Hidden Markov Models to social media data of UOI to predict La Liga soccer matches

University of Massachusetts, Department of Economics
RESEARCH ASSISTANT

Amherst, MA
Oct 2016 – Dec 2017

- Gathered and cleaned meta-data for Computer Science papers submitted to arXiv.org from 2005 to 2014
- Matched arXiv papers with accepted papers to major CS conferences to form a data set for research purposes

Michigan Medicine, Department of Radiation Oncology
RESEARCH ASSISTANT

Ann Arbor, MI
May 2017 – Aug 2017

- Integrated a non-linear optimizer (IPOPT) with the current system operating in Variance Eclipse for optimizing cancer treatment plans

Michigan Medicine, Department of Radiation Oncology
RESEARCH ASSISTANT

Ann Arbor, MI
May 2016 – Aug 2016

- Migrated cancer patient data to an SQL database
- Created dose-volume histograms from patient data to support research on radiation cancer treatment

TEACHING EXPERIENCE

University of Michigan, Computer Science & Engineering Department
PRIMARY INSTRUCTOR – EECS 110: DISCOVER COMPUTER SCIENCE

Ann Arbor, MI
Aug 2022 – Dec 2022

- Prepared and delivered weekly lessons and labs (1 hour each) to 62 undergraduate students
- Conducted administrative duties such as grading, holding office hours, scheduling guest presentations, and overseeing a teaching assistant

MENTORING & ADVISING

2023 – Present Nicholas Grabill (*undergraduate*)

2020 – 2022 Shaily Fozdar (*undergraduate*)

HONORS & AWARDS

2023 **Rackham Conference Travel Grant for AAI 2023**, Rackham Graduate School, University of Michigan Ann Arbor

2019 **Commonwealth Honors College Multidisciplinary Honors**, University of Massachusetts Amherst

2019 **Commonwealth Honors College with Great Distinction**, University of Massachusetts Amherst

2016 **Phi Kappa Phi Honor Society Inductee**, University of Massachusetts Amherst

PROFESSIONAL SERVICE & VOLUNTEERING

- 2023 Student Application Support Program volunteer
- 2022 Mentor for EECS 110 Discover CS
- 2022 CS Kickstart presenter
- 2019 AI Symposium volunteer

INVITED TALKS

1. “Flagging Payments for Fraud Detection: A Strategic Agent-Based Model”.
Young Scholars Conference on Machine Learning in Economics and Finance at the Philadelphia Federal Reserve, December 2023

WORKING PAPERS

1. **Katherine Mayo**, Nicholas Grabill, and Michael P. Wellman. “**Fraud Risk Mitigation in Real-Time Payments: A Strategic Agent-Based Analysis**”.
2. Michael P. Wellman and **Katherine Mayo**. “**Navigating in a Space of Game Views**”.

CONFERENCE PUBLICATIONS

1. **Katherine Mayo** and Michael P. Wellman. “**A Strategic Analysis of Portfolio Compression**”. In *ICAIF '21: 2nd ACM International Conference on AI in Finance, November 2021*.
2. **Katherine Mayo**, Shaily Fozdar, and Michael P. Wellman. “**An Agent-Based Model of Strategic Adoption of Real-Time Payments**”. In *ICAIF '21: 2nd ACM International Conference on AI in Finance, November 2021*.

JOURNAL PUBLICATIONS

1. Michelle Mierzwa, Charles Mayo, Pratyusha Yalamanchi, Joseph Evans, Francis Worden, Richard Medlin, Matt Schipper, Caitlin Schonewolf, Jennifer Shah, Matthew Spector, Paul Swiecicki, **Katherine Mayo**, Keith Casper. “**Machine Learning Model of Emergency Department Use for Patients Undergoing Treatment for Head and Neck Cancer Using Comprehensive Multifactor Electronic Health Records**”. In *JCO Clinical Cancer Informatics, January 2023*.

WORKSHOP

1. **Katherine Mayo**, Shaily Fozdar, and Michael P. Wellman. “**Flagging Payments for Fraud Detection: A Strategic Agent-Based Model**”.
AAAI Workshop on Modeling Uncertainty in the Financial World (MUFIn), 2023