KATHERINE MAYO

Artificial Intelligence (AI) Researcher
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RESEARCH INTERESTS

I apply methods from artificial intelligence to gain insights into complex interactions in financial networks.

[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 *Ann Arbor, MI*
Ph.D in Computer Science & Engineering *Sept 2019 – May 2024*

- 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 *Ann Arbor, MI*
M.S. in Computer Science & Engineering *Sept 2019 – April 2021*

- Relevant Coursework: Electronic Commerce; Advanced Data Mining; International Finance; Reinforcement Learning Theory; Advanced Artificial Intelligence

University of Massachusetts Amherst *Amherst, MA*
B.S. Computer Science, B.A. Economics, Minor in Chinese *Sept 2015 – Feb 2019*

- *cum laude*
- Graduate level coursework: Neural Networks: A Modern Introduction
- 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 *Ann Arbor, MI*
Graduate Student Research Assistant – Strategic Reasoning Group *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
- Developed the Strategic Feature Gains Assessment

Michigan Medicine, Department of Radiation Oncology *Ann Arbor, MI/Remote*
Research Assistant *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 using InterpretML
- Applied machine learning models (random forest, logistic regression, support vector machines, and naive Bayes) to predict ER visits

Systems & Technology Research *Woburn, MA*
Intelligence Tools and Analytics Intern *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 *Amherst, MA*
Research Assistant *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 *Ann Arbor, MI*
Research Assistant *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 *Ann Arbor, MI*
Research Assistant *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 *Ann Arbor, MI*
Primary Instructor – EECS 110: Discover Computer Science *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

HONORS & AWARDS

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

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

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

PROFESSIONAL SERVICE & VOLUNTEERING

2024 Prospective PhD Student Visit Day volunteer
2023 Student Application Support Program volunteer
2022 Mentor for EECS 110 Discover CS
2022 CS Kickstart presenter
2019 AI Symposium volunteer

MENTORING & ADVISING

2023 – 2024 Nicholas Grabill *(undergraduate)*
2020 – 2022 Shaily Fozdar *(undergraduate)*

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"**. *Under review*.
2. Michael P. Wellman and **Katherine Mayo**. **"Navigating in a Space of Game Views"**. *Under review*.

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), February 2023