

Responsibility in AI Systems & Experiences (RAISE) at the University of Washington presents:



John Dickerson

Designing Efficient, Fair, & Robust Platform Markets: Case Studies in Worldwide Blood Donation and Organ Exchange

Friday May 13, 2022, 9-10am PT

Join: <https://washington.zoom.us/j/94636255672>

Abstract: Markets are systems that empower interested parties – humans, firms, governments, or autonomous agents – to exchange goods, services, and information. In some markets, such as stock and commodity exchanges, prices do all of the “work” of matching supply and demand. Due to logistical or societal constraints, many markets, e.g., school choice, rideshare, online dating, advertising, cadaveric organ allocation, online labor, public housing, refugee placement, and kidney exchange, cannot rely solely on prices to match supply and demand. Techniques from artificial intelligence (AI), computer science, and mathematics have a long history of both being created via, and also finding application in, the design and analysis of markets of both types. AI techniques determine how to discover structure in an uncertain matching problem, learn how to decide between matching now versus waiting, and balance competing objectives such as fairness, diversity, and economic efficiency.

This talk covers optimization- and AI-based approaches to the design and analysis of markets. It focuses on managing uncertainty – specifically, on optimizing costly information gathering done before a clearing algorithm is run, and then incorporating that uncertainty into the algorithm(s) at clearing time. Techniques will be presented through the lens of worldwide blood donation as well as kidney exchange, an organized market where patients with end-stage renal failure swap willing but incompatible donors. These markets are currently fielded nationally and internationally and are run (to varying degrees) by AI-based systems, thus surfacing pertinent questions at the intersection of ethics and artificial intelligence.

This talk covers recent work published in the last couple of years at AAI, AIJ, EC, ICML, JAIR, Management Science, NeurIPS, and Operations Research, as well as work that is currently under submission.

Bio: John P Dickerson is an Assistant Professor of Computer Science at the University of Maryland as well as Chief Scientist of Arthur AI, an enterprise-focused AI/ML model monitoring firm. He is a recipient of awards such as the NSF CAREER Award, IEEE Intelligent Systems AI's 10 to Watch, Google Faculty Research Award, Google AI for Social Good Award, and paper awards and nominations at venues such as AAI. His research centers on solving economic problems using techniques from computer science, stochastic optimization, and machine learning. He has worked extensively on theoretical and empirical approaches to organ exchange where his work has set policy at the UNOS nationwide kidney exchange; worldwide blood donation markets with Facebook; game-theoretic approaches to counter-terrorism and negotiation, where his models have been deployed; and market design problems in industry (e.g., online advertising) through various startups. Dickerson received his PhD in computer science from Carnegie Mellon University.

RAISE is a UW-wide group of students and faculty interested in the broad space of responsibility in AI, trustworthy machine learning, human-centered computing and data science. As part of this group, our mission is to engage in scholarly, educational, and outreach activities that lead to foundational research in these areas.

<https://www.raise.uw.edu>.

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