# John P Dickerson

## Curriculum Vitae

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## Academic Experience

| | | |
|---|---|---|
| 2016– | U. of Maryland | Assistant Professor, Department of Computer Science |
| | *Joint Appointment* | Institute for Advanced Computer Studies (UMIACS) |
| | *Affiliation* | Applied Math/Stats and Scientific Computation (AMSC) |
| | *Affiliation* | Human-Computer Interaction Lab (HCIL) |
| 2010–16 | CMU | Graduate Research Assistant, Electronic Marketplaces Lab |
| 2008–12 | UMD | Researcher, Lab for Computational Cultural Dynamics |

## Industry & Non-Profit Experience

| | | |
|---|---|---|
| 2018– | Public Spend Forum | Advisor |
| 2018– | Zenful | Advisor |
| 2012– | Optimized Markets | Algorithms & optimization consultant |
| 2010–17 | OPTN/UNOS | Algorithms consultant for US national kidney exchange |
| 2005 | IBM | Global Contract Preparation System (GCPS) |
| 2003–04 | US Dept of Defense | Bioinformatics and security R&D |

## Education

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|---|---|---|---|
| 2016 | Ph.D. | Carnegie Mellon University | Computer Science |
| 2014 | M.Sc. | Carnegie Mellon University | Computer Science |
| 2008 | B.Sc. | University of Maryland | Computer Science |
| 2008 | B.Sc. | University of Maryland | Mathematics |

## Areas of Expertise

Artificial intelligence, stochastic optimization, game theory, computational economics, market & mechanism design, machine learning, kidney exchange, healthcare policy & information technology
*I am especially interested in optimal decision making and optimization in healthcare and the social sciences.*

## Awards & Distinctions

| | |
|---|---|
| 2019 | National Science Foundation CAREER Award |
| 2018 | Outstanding Student Paper Honorable Mention, AAAI 2018. |
| 2015–17 | Facebook Fellowship |
| 2015–16 | Siebel Scholarship |
| 2014 | FutureMatch, our framework for dynamic matching, won HPCWire's "Best Data-Intensive Application" award (joint with Pittsburgh Supercomputing Center) |
| 2012–15 | NDSEG Fellowship |

## Research Funding

Values given below are best estimates; "UMD CS" refers to the dollar amount awarded to my department, while "Total" is an estimate of the total value of the award. Fellowships awarded directly to other researchers in my group are listed elsewhere, under "Advising & Mentorship."

| Year(s) | Description | UMD CS | Total |
|---|---|---|---|
| 2019–23 | NSF CAREER Award IIS-1846237: *CAREER: Scalable and Robust Dynamic Matching Market Design*. Sole PI: Dickerson. | $550,000 | $550,000 |

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| 2019–21 | DARPA Disruptioneering Award (SI3-CMD) #TBD: *Decision Making via Hierarchy of Network Games: Algorithms, Game Theory, Artificial Intelligence, and Learning.* PI: Erik Demaine (MIT CS), co-PIs: Fotini Christia (MIT Political Science), Constantinos Daskalakis (MIT CS), Dickerson, Mohammad-Taghi HajiAghayi (UMD CS). | $400,000 | $1,000,000 |
|---|---|---|---|
| 2019 | Google Gift: *Dynamic and Scalable Matching, Query Markets, and Allocation under Complex Objective Functions.* PIs: Dickerson, Aravind Srinivasan (UMD CS). | $75,000 | $75,000 |
| 2019 | Google Cloud Credits Gift: PIs: Dickerson, Aravind Srinivasan (UMD CS). | $7,500 | $7,500 |
| 2018-22 | NIH R01 Award NLM-013039-01: *HealthyMe/MiSalud Smartphone Application: Identifying Mechanisms to Engage African Americans and Hispanics in Personal Health Libraries.* PI: Cynthia Baur (UMD Public Health), co-PIs: Robert S. Gold (UMD Public Health), Neil Sehgal (UMD Public Health). | $133,146 | $1,300,000 |
| 2018 | Smith AI in Business and Society Seed Grant, PIs: Dickerson, Ilya Ryzhov (UMD Business), Aravind Srinivasan (UMD CS). | $17,500 | $20,000 |
| 2016–18 | Israeli Ministry of Defense Award #4440766810: *Functional Targeting of Terror Networks: A Big Data Approach.* PI transfer from V.S. Subrahmanian (Dartmouth CS). | $9,000 | $150,000 |
| 2014 | NSF SBIR Phase I Award #1345567. PI transfer from Tuomas Sandholm (CMU & Optimized Markets). I served as PI at Optimized Markets, Inc., for the duration of the award. | *Awarded to Optimized Markets* | $150,000 |

**... Funding for research-related, educational, & outreach activities outside of my group.**

| Year(s) | Description | UMD CS | Total |
|---|---|---|---|
| 2019-21 | NSF Award CCF-TBD: *REU Site: CAAR: Combinatorics and Algorithms Applied to Real Problems.* PI: Bill Gasarch (UMD CS), co-PI: Dickerson. | $360,000 | $360,000 |
| 2018 | NSF Award CNS-1838985: *Student Travel to the Cornell, Maryland, Max Planck Pre-doctoral Research School.* PI: Bobby Bhattacharjee (UMD CS), co-PI: Dickerson. | *Travel grant* | $49,996 |

# Publications

## Working papers

1. Curry, M, JP Dickerson, KA Sankararaman, A Srinivasan, Y Wan, and P Xu (2018). Mix and Match: Markov Chains and Mixing Times for Matching in Rideshare. Working paper; available upon request.

2. Durvasula, N, A Srinivasan, and JP Dickerson (2018). A Bayesian Optimization Approach to Estimating Expected Match Time and Organ Quality in Kidney Exchange. Working paper; available upon request.

3. McElfresh, D, V Conitzer, and JP Dickerson (2018). Ethics and Mechanism Design in Kidney Exchange. Working paper; available upon request.

4. Schumann, C, Z Lang, J Foster, and JP Dickerson (2018). Making the Cut: A Bandit-based Approach to Tiered Interviewing. Working paper; available upon request.

5. Shafahi, A, M Najibi, Z Xu, JP Dickerson, LS Davis, and T Goldstein (2018). Universal Adversarial Training. *CoRR* **abs/1811.11304**. Working paper.

6. Rosemarin, H, JP Dickerson, and S Kraus (2017). Learning to Schedule Deadline- and Operator-Sensitive Tasks. *CoRR* **abs/1706.06051**. Working paper.

7. Plaut, B, JP Dickerson, and T Sandholm (2016). Hardness of the Pricing Problem for Chains in Barter Exchange. *CoRR* **abs/1606.00117**. Working paper.

## Books

1. Subrahmanian, V, A Mannes, A Sliva, J Shakarian, and JP Dickerson (2012). *Computational Analysis of Terrorist Groups: Lashkar-e-Taiba*. New York: Springer. ISBN: 978-1-4614-4768-9.

## Highly-refereed conference papers

*Conferences are the primary publication venue in Computer Science, with competitive acceptance rates of* 15–30%.

1. Dickerson, JP, KA Sankararaman, K Sarpatwar, A Srinivasan, KL Wu, and P Xu (2019). Online Resource Allocation with Matching Constraints. In: *International Conference on Autonomous Agents and Multi-Agent Systems (AAMAS)*.

2. Dickerson, JP, KA Sankararaman, A Srinivasan, and P Xu (2019). Balancing Relevance and Diversity in Online Bipartite Matching via Submodularity. In: *Conference on Artificial Intelligence (AAAI)*.

3. McElfresh, D, H Bidkhori, and JP Dickerson (2019). Scalable Robust Kidney Exchange. In: *Conference on Artificial Intelligence (AAAI)*.

4. Schumann, C, SN Counts, J Foster, and JP Dickerson (2019). The Diverse Cohort Selection Problem. In: *International Conference on Autonomous Agents and Multi-Agent Systems (AAMAS)*.

5. Xu, P, Y Shi, H Cheng, JP Dickerson, KA Sankararaman, A Srinivasan, Y Tong, and L Tsepenekas (2019). A Unified Approach to Online Matching with Conflict-Aware Constraints. In: *Conference on Artificial Intelligence (AAAI)*.

6. Dickerson, JP, KA Sankararaman, A Srinivasan, and P Xu (2018). Allocation Problems in Ride-Sharing Platforms: Online Matching with Offline Reusable Resources. In: *Conference on Artificial Intelligence (AAAI)*.

7. Dickerson, JP, KA Sankararaman, A Srinivasan, and P Xu (2018). Assigning Tasks to Workers based on Historical Data: Online Matching with Two-sided Arrivals. In: *International Conference on Autonomous Agents and Multi-Agent Systems (AAMAS)*.

8. Freedman, R, J Schaich Borg, W Sinnott-Armstrong, JP Dickerson, and V Conitzer (2018). Adapting a Kidney Exchange Algorithm to Align with Human Values. In: *Conference on Artificial Intelligence (AAAI)*. **Outstanding Student Paper Honorable Mention**.

9. Li, Z, N Gupta, S Das, and JP Dickerson (2018). Equilibrium Behavior in Competing Dynamic Matching Markets. In: *International Joint Conference on Artificial Intelligence (IJCAI)*.

10. McElfresh, D and JP Dickerson (2018). Balancing Lexicographic Fairness and a Utilitarian Objective with Application to Kidney Exchange. In: *Conference on Artificial Intelligence (AAAI)*.

11. Redmiles, EM, M Mazurek, and JP Dickerson (2018). Dancing Pigs or Externalities? Measuring the Rationality of Security Decisions. In: *Conference on Economics and Computation (EC)*.

12. Ahmed, F, JP Dickerson, and M Fuge (2017). Diverse Weighted Bipartite b-Matching. In: *International Joint Conference on Artificial Intelligence (IJCAI)*.

13. Dickerson, JP, AM Kazachkov, AD Procaccia, and T Sandholm (2017). Small Representations of Big Kidney Exchange Graphs. In: *Conference on Artificial Intelligence (AAAI)*.

14. Farina, G, JP Dickerson, and T Sandholm (2017). Operation Frames and Clubs in Kidney Exchange. In: *International Joint Conference on Artificial Intelligence (IJCAI)*.

15. Dickerson, JP, D Manlove, B Plaut, T Sandholm, and J Trimble (2016). Position-Indexed Formulations for Kidney Exchange. In: *Conference on Economics and Computation (EC)*.

16. Plaut, B, JP Dickerson, and T Sandholm (2016). Fast Optimal Clearing of Capped-Chain Barter Exchanges. In: *Conference on Artificial Intelligence (AAAI)*.

17. Blum, A, JP Dickerson, N Haghtalab, AD Procaccia, T Sandholm, and A Sharma (2015). Ignorance is Almost Bliss: Near-Optimal Stochastic Matching With Few Queries. In: *Conference on Economics and Computation (EC)*.

18. Das, S, JP Dickerson, Z Li, and T Sandholm (2015). Competing Dynamic Matching Markets. In: *Conference on Auctions, Market Mechanisms, and Their Applications (AMMA)*.

19. Dickerson, JP and T Sandholm (2015). FutureMatch: Combining Human Value Judgments and Machine Learning to Match in Dynamic Environments. In: *Conference on Artificial Intelligence (AAAI)*.

20. Hajaj, C, JP Dickerson, A Hassidim, T Sandholm, and D Sarne (2015). Strategy-Proof and Efficient Kidney Exchange Using a Credit Mechanism. In: *Conference on Artificial Intelligence (AAAI)*.

21. Dickerson, JP, J Goldman, J Karp, AD Procaccia, and T Sandholm (2014). The Computational Rise and Fall of Fairness. In: *Conference on Artificial Intelligence (AAAI)*.

22. Dickerson, JP, V Kagan, and V Subrahmanian (2014). Using Sentiment to Detect Bots on Twitter: Are Humans more Opinionated than Bots? In: *International Conference on Advances in Social Networks Analysis and Mining (ASONAM)*.

23. Dickerson, JP, AD Procaccia, and T Sandholm (2014). Price of Fairness in Kidney Exchange. In: *International Conference on Autonomous Agents and Multi-Agent Systems (AAMAS)*.

24. Dickerson, JP and T Sandholm (2014). Multi-Organ Exchange: The Whole is Greater than the Sum of its Parts. In: *Conference on Artificial Intelligence (AAAI)*.

25. Erickson, LC, ED Thiessen, KE Godwin, JP Dickerson, and AV Fisher (2014). Endogenously- but not Exogenously-driven Selective Sustained Attention is Related to Learning in a Classroom-like Setting in Kindergarten Children. In: *Conference of the Cognitive Science Society (CogSci)*.

26. Dickerson, JP, AD Procaccia, and T Sandholm (2013). Failure-Aware Kidney Exchange. In: *Conference on Economics and Computation (EC)*.

27. Dickerson, JP and T Sandholm (2013). Throwing darts: Random sampling helps tree search when the number of short certificates is moderate. In: *Conference on Artificial Intelligence (AAAI)*. Late-breaking paper.

28. Dickerson, JP, A Sawant, M Hajiaghayi, and V Subrahmanian (2013). PREVE: A Policy Recommendation Engine based on Vector Equilibria Applied to Reducing LeT's Attacks. In: *International Conference on Advances in Social Networks Analysis and Mining (ASONAM)*.

29. Dickerson, JP, AD Procaccia, and T Sandholm (2012). Dynamic Matching via Weighted Myopia with Application to Kidney Exchange. In: *Conference on Artificial Intelligence (AAAI)*.

30. Dickerson, JP, AD Procaccia, and T Sandholm (2012). Optimizing Kidney Exchange with Transplant Chains: Theory and Reality. In: *International Conference on Autonomous Agents and Multi-Agent Systems (AAMAS)*.

31. Dickerson, JP, GI Simari, V Subrahmanian, and S Kraus (2010). A Graph-Theoretic Approach to Protect Static and Moving Targets from Adversaries. In: *International Conference on Autonomous Agents and Multi-Agent Systems (AAMAS)*.

32. Simari, GI, JP Dickerson, and V Subrahmanian (2010). Cost-based Query Answering in Action Probabilistic Logic Programs. In: *International Conference on Scalable Uncertainty Management (SUM)*.

## Journal papers

1. Blum, A, JP Dickerson, N Haghtalab, AD Procaccia, T Sandholm, and A Sharma (2019). Ignorance is Almost Bliss: Near-Optimal Stochastic Matching With Few Queries. *Operations Research*. To appear.

2. Dickerson, JP, AD Procaccia, and T Sandholm (2018). Failure-Aware Kidney Exchange. *Management Science*. To appear.

3. Doebel, S, JP Dickerson, JD Hoover, and Y Munakata (2018). Using language to get ready: Familiar labels help children to engage proactive control. *Journal of Experimental Child Psychology*.

4. Dickerson, JP and T Sandholm (2017). Multi-Organ Exchange. *Journal of Artificial Intelligence Research (JAIR)* **60**, 639–679.

5. Erickson, LC, ED Thiessen, KE Godwin, JP Dickerson, and AV Fisher (2015). Endogenously- and Exogenously-driven Selective Sustained Attention: Contributions to Learning in Kindergarten Children. *Journal of Experimental Child Psychology*.

6. Sawant, A, JP Dickerson, MT Hajiaghayi, and V Subrahmanian (2015). Automated Generation of Counter-Terrorism Policies using Multi-Expert Input. *ACM Transactions on Intelligent Systems and Technology (TIST)*.

7. Fisher, A, E Thiessen, K Godwin, H Kloos, and JP Dickerson (2013). Assessing selective sustained attention in 3- to 5-year-old children: Evidence from a new paradigm. *Journal of Experimental Child Psychology* **113**.

8. Simari, GI, JP Dickerson, A Sliva, and V Subrahmanian (2013). Parallel Abductive Query Answering in Probabilistic Logic Programs. *ACM Transactions on Computational Logic (TOCL)*.

9. Patro, R, JP Dickerson, S Bista, SK Gupta, and A Varshney (2012). Speeding Up Particle Trajectory Simulations under Moving Force Fields using GPUs. *ASME Journal of Computing and Information Science in Engineering (JCISE)* **12**(2), 021006:1–021006:8.

10. Shakarian, P, JP Dickerson, and V Subrahmanian (2012). Adversarial Geospatial Abduction Problems. *ACM Transactions on Intelligent Systems and Technology (TIST)* **3**(2), 34:1–34:35.

11. Subrahmanian, V and JP Dickerson (2009). What Can Virtual Worlds and Games Do for National Security? *Science* **326**(5957), 1201–1202.

## Workshop and smaller conference papers

1. Cui, G, JP Dickerson, N Durvasula, W Gasarch, E Metz, J Prinz, N Raman, D Smolyak, and SH Yoo (2018). A Muffin-Theorem Generator. In: *International Conference on Fun with Algorithms (FUN)*. Working paper. Full version available as "The Muffin Problem" at arXiv:abs/1709.02452.

2. McElfresh, D and JP Dickerson (2018). Balancing Lexicographic Fairness and a Utilitarian Objective with Application to Kidney Exchange. In: *2018 Workshop on Health Intelligence (W3PHIAI) at AAAI-18*.

3. Dickerson, JP, AM Kazachkov, AD Procaccia, and T Sandholm (2017). Small Representations of Big Kidney Exchange Graphs. In: *Workshop on AI and OR for Social Good (AIORSocGood) at AAAI-17*.

4. Farina, G, JP Dickerson, and T Sandholm (2017). Inter-Club Kidney Exchange. In: *Workshop on AI and OR for Social Good (AIORSocGood) at AAAI-17*.

5. Farina, G, JP Dickerson, and T Sandholm (2017). Multiple Willing Donors and Organ Clubs in Kidney Exchange. In: *Algorithmic Game Theory (AGT) workshop at IJCAI-17*.

6. Schumann, C, SN Counts, J Foster, and JP Dickerson (2017). The Diverse Cohort Selection Problem: Multi-Armed Bandits with Varied Pulls. In: *Aligned AI Workshop at NIPS-17*.

7. Schumann, C, SN Counts, J Foster, and JP Dickerson (2017). The Diverse Cohort Selection Problem: Multi-Armed Bandits with Varied Pulls. In: *Women in Machine Learning (WiML) Workshop at NIPS-17*.

8. Dickerson, JP, AM Kazachkov, AD Procaccia, and T Sandholm (2016). Small Representations of Big Kidney Exchange Graphs. In: *Exploring Beyond the Worst Case in Computational Social Choice (EXPLORE) workshop at AAMAS-2016*. **Most Visionary Paper**.

9. Dickerson, JP and T Sandholm (2015). Uncertainty in Dynamic Matching with Application to Organ Exchange. In: *Machine Learning for Healthcare (MLHC) workshop at NIPS-2015*.

10. Banaszak, S, E Bowman, JP Dickerson, and V Subrahmanian (2014). Forecasting Country Stability in North Africa. In: *Joint Intelligence & Security Informatics Conference (JISIC)*.

11. Dickerson, JP (2014). Robust Dynamic Optimization with Application to Kidney Exchange. In: *Doctoral Consortium at AAMAS-2014*.

12. Dickerson, JP, J Goldman, J Karp, AD Procaccia, and T Sandholm (2014). The Computational Rise and Fall of Fairness. In: *Exploring Beyond the Worst Case in Computational Social Choice (EXPLORE) workshop at AAMAS-2014*.

13. Dickerson, JP, AD Procaccia, and T Sandholm (2014). Empirical Price of Fairness in Failure-Aware Kidney Exchange. In: *Towards Better and more Affordable Healthcare: Incentives, Game Theory, and Artificial Intelligence (HCAGT) workshop at AAMAS-2014*.

14. Dickerson, JP and T Sandholm (2014). Balancing Efficiency and Fairness in Dynamic Kidney Exchange. In: *Modern Artificial Intelligence for Health Analytics (MAIHA) workshop at AAAI-2014*.

15. Dickerson, JP and T Sandholm (2013). Liver and Multi-Organ Exchange. In: *IJCAI-2013 Workshop on Constraint Reasoning, Planning and Scheduling Problems for a Sustainable Future (COPLAS)*.

16. Dickerson, JP and T Sandholm (2013). Throwing darts: Random sampling helps tree search when the number of short certificates is moderate. In: *International Symposium on Combinatorial Search (SoCS)*.

17. Dickerson, JP, A Mannes, and V Subrahmanian (2011). Dealing with Lashkar-e-Taiba: A Multi-Player Game-Theoretic Perspective. In: *International Symposium on Open Source Intelligence and Web Mining*.

18. Dickerson, JP, MV Martinez, D Reforgiato, and V Subrahmanian (2008). CIG: Cultural Islands and Games. In: *International Conference on Computational Cultural Dynamics*.

## Book chapters

1. Dickerson, JP, GI Simari, and V Subrahmanian (2013). "Using Temporal Probabilistic Rules to Learn Group Behavior". In: *Handbook of Computational Approaches to Counterterrorism*. Ed. by V Subrahmanian. Springer New York.

2. Simari, GI, JP Dickerson, A Sliva, and V Subrahmanian (2013). "Policy Analytics Generation using Action Probabilistic Logic Programs". In: *Handbook of Computational Approaches to Counterterrorism*. Ed. by V Subrahmanian. Springer New York.

3. Shakarian, P, JP Dickerson, and V Subrahmanian (2012). "Geospatial Abduction with Adaptive Adversaries". In: *Geospatial Abduction: Principles and Practice*. Ed. by P Shakarian and V Subrahmanian. Springer. Chap. 4.

## Refereed and invited tutorials

1. Das, S, JP Dickerson, and B Wilder (2019). *Optimization & Learning Approaches to Resource Allocation for Social Good*. Half-day tutorial at the International Conference on Autonomous Agents and Multi-Agent Systems (AAMAS).

2. Dickerson, JP (2019). *Learning & Kidney Exchange*. Half-day tutorial at Conference on Economic Design (CED).

3. Dickerson, JP (2018). *Ethical Market Design via Optimization*. Three 1.5-hour lectures at the Cornell, Maryland, Max Planck Pre-doctoral Research School (CMMRS) 2018.

4. Dickerson, JP and T Sandholm (2016). *Organ Exchange: A Success Story of AI in Healthcare*. Half-day tutorial at the Conference on Artificial Intelligence (AAAI).

5. Dickerson, JP and T Sandholm (2016). *Organ Exchange: A Success Story of AI in Healthcare*. Half-day tutorial at the International Conference on Autonomous Agents and Multi-Agent Systems (AAMAS).

6. Dickerson, JP and T Sandholm (2016). *Organ Exchange: A Success Story of AI in Healthcare*. Half-day tutorial at the International Joint Conference on Artificial Intelligence (IJCAI).

## Invited talks

1. Dickerson, JP (2018). *Diversity in Matching Markets*. Invited talk, IBM Watson (Reasoning PIC / AI Science Reasoning Group).

2. Dickerson, JP (2018). *Diversity in Matching Markets*. Invited talk, Facebook (Core Data Sciences).

3. Dickerson, JP (2018). *Diversity in Matching Markets*. Invited talk, Carnegie Mellon University (CMU).

4. Dickerson, JP (2018). *Increasing Access to Organs through Market Design and Optimization*. Invited talk, Facebook (Core Data Sciences).

5. Dickerson, JP (2018). *Introduction to Algorithms, Artificial Intelligence, and Predictive Analytics*. Invited talk, FTC Hearings on Competition and Consumer Protection in the 21st Century.

6. Dickerson, JP (2018). *Using Optimization to Balance Fairness and Efficiency in Kidney Exchange*. Invited talk, American University.

7. Dickerson, JP (2018). *Using Optimization to Balance Fairness and Efficiency in Kidney Exchange*. Invited talk, Dartmouth College.

8. Dickerson, JP and A Srinivasan (2018). *Better Allocation and Matching via Optimization and Machine Learning*. Invited talk, Google (Mountain View).

9. Dickerson, JP (2017). *Better Matching Markets Through Optimization*. Invited talk, United States Naval Academy (USNA).

10. Dickerson, JP (2017). *Better Matching Markets Through Optimization*. Invited talk, Laboratory for Telecommunication Sciences (LTS).

11. Dickerson, JP (2017). *Better Matching Markets Through Optimization*. Invited talk, Stanford University.

12. Dickerson, JP (2017). *Better Matching Markets Through Optimization*. Invited talk, University of British Columbia.

13. Dickerson, JP (2017). Recent Advances in Optimization and Machine Learning for Kidney Exchange. In: *INFORMS Healthcare Conference*. Invited talk.

14. Dickerson, JP (2016). *Better Matching Markets Through Optimization*. Invited talk, Duke University.

15. Dickerson, JP (2016). Small Representations of Big Kidney Exchange Graphs. In: *INFORMS Annual Conference*. Invited talk, Healthcare Applications Society cluster.

16. Dickerson, JP (2016). Small Representations of Big Kidney Exchange Graphs. In: *28th European Conference on Operational Research (EURO)*. Invited talk, Healthcare Logistics stream.

17. Dickerson, JP (2016). *Swapping Kidneys: Better Matching Market Design via Optimization*. Invited talk, Data Science DC.

18. Dickerson, JP (2016). Toward a Credit-Based Mechanism for Dynamic Kidney Exchange. In: *INFORMS Annual Conference*. Invited talk, Auctions cluster.

19. Dickerson, JP (2016). Uncertainty in Dynamic Matching with Application to Organ Exchange. In: *INFORMS Annual Conference*. Invited talk.

20. Dickerson, JP, D Manlove, B Plaut, T Sandholm, and J Trimble (2016). Position-Indexed Formulations for Kidney Exchange. In: *INFORMS Annual Conference*. Invited talk, Healthcare Applications Society cluster.

21. Das, S, JP Dickerson, Z Li, and T Sandholm (2015). Competing Dynamic Matching Markets. In: *INFORMS Annual Conference*. Invited talk, Auctions cluster.

22. Dickerson, JP (2015). Combining Human Value Judgments and Machine Learning to Match in Dynamic Environments. In: *International Symposium on Mathematical Programming (ISMP)*. Invited talk, Life Sciences and Healthcare cluster.

23. Dickerson, JP (2015). Combining Human Value Judgments and Machine Learning to Match in Dynamic Environments. In: *INFORMS Healthcare Conference*. Invited talk, Health Operations & Logistics cluster.

24. Dickerson, JP (2015). Near-optimal Stochastic Matching With Few Queries. In: *INFORMS Annual Conference*. Invited talk, Auctions cluster.

25. Dickerson, JP (2015). The Dynamics of Kidney Exchange. In: *Production and Operations Management Society (POMS) Annual Conference*. Invited talk, Healthcare Operations Management track.

26. Dickerson, JP (2014). *FutureMatch: Combining Human Value Judgments and Machine Learning to Match in Dynamic Environments*. DB Seminar, Carnegie Mellon University, Pittsburgh, PA.

27. Dickerson, JP and T Sandholm (2014). FutureMatch: Combining Human Value Judgments and Machine Learning to Match in Dynamic Environments. In: *INFORMS Annual Conference*. Invited talk, Auctions cluster.

28. Dickerson, JP (2013). *Failure-Aware Kidney Exchange*. Tsinghua University, Beijing, China.

29. Dickerson, JP, AD Procaccia, and T Sandholm (2013). Failure-Aware Kidney Exchange. In: *INFORMS Annual Conference*. Invited talk, Auctions cluster.

30. Dickerson, JP, AD Procaccia, and T Sandholm (2012). Dynamic Matching via Weighted Myopia with Application to Kidney Exchange. In: *INFORMS Annual Conference*. Invited talk, Computational Stochastic Optimization cluster.

31. Dickerson, JP, AD Procaccia, and T Sandholm (2012). Optimizing Kidney Exchange with Transplant Chains: Theory and Reality. In: *INFORMS Annual Conference*. Invited talk, Market Mechanisms and their Applications session.

## Patents

1. Sandholm, T, F Peng, and JP Dickerson (2017). "Automated Allocation Of Media Campaign Assets To Time And Program In Digital Media Delivery Systems". US Patent #9,699,502.

## Other publications and presentations

1. Redmiles, EM, JP Dickerson, KP Gummadi, and M Mazurek (2018). Equitable Security: Optimizing Distribution of Nudges and Resources. In: *ACM Conference on Computer and Communications Security (CCS)*. Abstract of poster.

2. Redmiles, EM, M Mazurek, and JP Dickerson (2018). Do Users Make Rational Security Decisions? In: *Network and Distributed System Security Symposium (NDSS)*. Abstract of poster, **Best Poster Honorable Mention**.

3. Sandholm, T, G Farina, JP Dickerson, R Leishman, D Stewart, R Formica, C Thiessen, and S Kulkarni (2017). A Novel KPD Mechanism to Increase Transplants When Some Candidates Have Multiple Willing Donors. In: *American Transplant Congress (ATC)*. Abstract of poster.

4. Dickerson, JP (2016). Fast Optimal Clearing of Capped-Chain Barter Exchanges. In: *INFORMS Optimization Society (IOS) Conference*.

5. Dickerson, JP (2016). FutureMatch: Combining Human Value Judgments and Machine Learning to Match in Dynamic Environments. In: *World Congress on Game Theory (GAMES)*.

6. Das, S, JP Dickerson, Z Li, and T Sandholm (2015). Competing Dynamic Matching Markets. In: *Conference on Economics and Computation (EC)*. Abstract of poster.

7. Erickson, LC, K Godwin, JP Dickerson, ED Thiessen, and AV Fisher (2015). Different mechanisms for regulating sustained attention and learning in children. In: *Biennial Meeting of the Society for Research in Child Development (SRCD)*.

8. Dickerson, JP, AD Procaccia, and T Sandholm (2014). Price of Fairness in Kidney Exchange. In: *World Transplant Congress (WTC)*. Abstract of poster.

9. Dickerson, JP and T Sandholm (2014). FutureMatch: Learning to Match in Dynamic Environments. In: *World Transplant Congress (WTC)*. Abstract of poster.

10. Dickerson, JP and T Sandholm (2014). FutureMatch: Learning to Match in Dynamic Environments. In: *Conference on Economics and Computation (EC)*. Abstract of poster.

11. Dickerson, JP and T Sandholm (2014). Toward Multi-Organ Exchange. In: *World Transplant Congress (WTC)*. Abstract of poster.

12. Dickerson, JP, AD Procaccia, and T Sandholm (2013). Optimizing Kidney Exchange with Transplant Chains: Theory and Reality. In: *American Transplant Congress (ATC)*. Abstract of poster.

13. Dickerson, JP, AD Procaccia, and T Sandholm (2013). Results About, and Algorithms For, Robust Probabilistic Kidney Exchange Matching. In: *American Transplant Congress (ATC)*. Abstract of poster.

14. Dickerson, JP and T Sandholm (2013). Liver and Multi-Organ Exchange. In: *INFORMS Annual Conference*. Contributed presentations.

15. Dickerson, JP and T Sandholm (2013). Liver and Multi-Organ Exchange. In: *American Transplant Congress (ATC)*. Abstract of poster.

16. Fisher, AV, ED Thiessen, JP Dickerson, and LC Erickson (2013). Development of Selective Sustained Attention: Conceptual and Measurement Issues. In: *Biennial Meeting of the Cognitive Development Society (CDS)*.

17. Thiessen, ED, JP Dickerson, LC Erickson, and AV Fisher (2012). Eyes as the windows of cognition: The Track-It paradigm and selective attention. In: *SRCD Themed Meeting on Developmental Methodology*.

18. Vargas-Baron, E, JP Dickerson, and V Subrahmanian (2009). *Country Profiles on Early Childhood Development: Sub-Saharan Africa*. Booklet for the 4th International Conference on Early Childhood Development.

19. Blusewicz, K, K de Souza, JP Dickerson, B Feldman, A Gaddam, G Ganesan, C Hatch, C Hilseberg, L Kawa, K LaCurts, K Nealon, C Yu, and J Zytnick (2008). *Classification of Perceived Emotion in Music using a Computational Model of the Auditory Cortex*. University of Maryland Gemstone Interdisciplinary Research Program Thesis.

## Advising & Mentorship

### Ph.D. Students

| Student | University | Year(s) | Details |
| --- | --- | --- | --- |
| Michael Curry | UMD | 2018– | Computer Science |
| Neal Gupta | UMD | 2017– | Computer Science |
| Duncan McElfresh | UMD | 2017– | Mathematics |
| Candice Schumann | UMD | 2017– | Computer Science |
| Pan Xu | UMD | 2017– | Computer Science. Co-advised with Aravind Srinivasan |

### Undergraduate Students

| Student | University | Year(s) | Project | Next Position |
| --- | --- | --- | --- | --- |
| Darshan Chakrabarti | CMU | 2018– | *Summer REU*, learning diversity functions, fairness in clustering | Strategic Machines |
| Mark "Kweku" Kwegyir-Aggrey | UMD | 2018– | Rideshare market optimization | |
| Yuhao Wan | Carleton | 2018– | *Summer REU*, learning diversity functions, rideshare market optimization | |
| Joseph "J.T." Bergman | UMD | 2017– | Deep learning for Korean character recognition | |
| Samsara Counts | GWU | 2017– | *Summer REU*, deep reinforcement learning for matching markets, diversity in matching markets | |
| Willy Lang | UMD | 2017– | diversity in matching markets | Flatiron Health |
| Cameron Moy | UMD | 2017–18 | *Summer REU*, deep reinforcement learning for matching markets | |
| Ishaan Parikh | UMD | 2017– | ethics and AI | |
| Linyi Xi | Haverford | 2017–18 | *Summer REU*, deep reinforcement learning for matching markets | CMU LTI |

| Ayman Karim | UMD | 2016–17 | using sentiment and social network analysis to predict winners in WWE matches | Blend |
| Aditya Mithas | UMD | 2016–17 | deep reinforcement learning for matching markets | Google |
| Kevin Schechter | UMD | 2016–17 | prediction markets | Microsoft |
| Benjamin Plaut | CMU | 2015–16 | combinatorial optimization and kidney exchange | Stanford CS |

### High School Students

| Student | School | Year(s) | Project | Next University |
| --- | --- | --- | --- | --- |
| Naveen Durvasula | Montgomery Blair | 2016– | Co-advised with Aravind Srinivasan. Mechanism design and Bayesian optimization for kidney exchange. | |

### Awards & Distinctions Won By Students

Awards below were won by students I advise (or with whom I work closely) for our joint research projects.

| Year | Student | Award |
| --- | --- | --- |
| 2018 | Pan Xu | Ann G. Wylie Dissertation Fellowship |
| 2018 | Samsara Counts | Honorable Mention for the 2018 NCWiT Collegiate Award |
| 2018 | Samsara Counts | Google Lime Scholar |
| 2017 | Naveen Durvasula | Intel International Science and Engineering Fair (ISEF) Finalist, and won the Ashtavadhani Vidwan Ambati Subbaraya Chetty Foundation Second Award at Intel ISEF. |
| 2016 | Benjamin Plaut | Allen Newell Award for Excellence in Undergraduate Research |

### Thesis Proposal & Defense Committees

| Student | University | Proposed | Defended | Next Position |
| --- | --- | --- | --- | --- |
| Alireza Farhadi | UMD | 2018 | TBD | |
| Soheil Behnezhad | UMD | 2018 | TBD | |
| Mahsa Derakhshan | UMD | 2018 | TBD | |
| Elissa Redmiles | UMD | 2018 | TBD | |
| Hadi Yami | UMD | 2018 | TBD | |
| Karthik A. Sankararaman | UMD | 2018 | TBD | |
| Soham De | UMD | – | 2018 | Research Scientist, Google DeepMind |
| Eric Krokos | UMD | 2017 | 2018 | US Department of Defense |
| Zhuoshu Li | WashU | 2017 | 2018 | Software Engineer, Google |
| Rama Padmanabhan | UMD | 2018 | 2018 | Post-doc, UCSD Computer Science |
| Jinfeng Rao | UMD | – | 2018 | Research Scientist, Facebook |
| Srijan Kumar | UMD | – | 2017 | Post-doc, Stanford Computer Science |
| Yulu Wang | UMD | – | 2017 | Software Engineer, Google |

## Teaching

Courses where I am lead instructor (that is, the person who designs lectures, teaches lectures, designs assignments, manages teaching assistants, assigns final grades, handles all administrative overhead, and so on):

| Semester | University | Course Code | Title | Co-Instructor(s) | Size |
| --- | --- | --- | --- | --- | --- |
| F2018 | UMD | CMSC641 | Principles of Data Science | – | 13 |
| F2018 | UMD | CMSC320 | Introduction to Data Science | *Saggar* | 222 |
| S2018 | UMD | CMSC828M | Applied Mechanism Design for Social Good | – | 34 |
| F2017 | UMD | CMSC320 | Introduction to Data Science | *Deshpande* | 185 |
| S2017 | UMD | CMSC320 | Introduction to Data Science | – | 82 |

| F2016 | UMD | CMSC828M | Applied Mechanism Design for Social Good | – | 22 |
| F2015 | CMU | 15-892 | Foundations of Electronic Marketplaces | *Sandholm* | 12 |

Courses where I am an "instructor of record" but only lightly advise the "real" instructors, who are typically junior and senior undergraduate students operating via the Student Initiated Courses (STICs) program at UMD:

| Semester | University | Course Code | Title | My Position | Size |
|---|---|---|---|---|---|
| S2019 | UMD | CMSC389K | Full-Stack Web Development with Node.js | Faculty Mentor | 30 |
| F2018 | UMD | CMSC389K | Full-Stack Web Development with Node.js | Faculty Mentor | 28 |
| S2018 | UMD | CMSC389K | Full-Stack Web Development with Node.js | Faculty Mentor | 28 |
| F2017 | UMD | CMSC389K | Full-Stack Web Development with Node.js | Faculty Mentor | 26 |

## Service

### Conferences

| | |
|---|---|
| Organizer | AAAI/SIGAI Job Fair Co-Chair (at AAAI'18, '19) |
| | AAMAS Sponsorship Chair NA ('19) |
| | DSAA Journal Track Co-Chair ('19) |
| | Fair Allocation in Multiagent Systems (FAMAS) (at AAMAS'19) |
| | EXPLORE (at AAMAS'17) |
| Steering Committee | Agents & Incentives in AI (AI$^3$) at AAMAS/ICML/IJCAI ('18) |
| SPC Member | AAAI (Social Impact Track '19) |
| | AAMAS ('19) |
| PC Member | AAAI ('13, '17, '18, '19) |
| | AAMAS ('17, '18) |
| | AISTATS ('17, '19) |
| | AI, Ethics, & Society ('18) |
| | COMSOC ('18) |
| | EC ('17, '18) |
| | ICML ('16, '17, '18) |
| | IJCAI ('13, '16, '17, '18) |
| | TinyToCS ('12) |
| PC (Workshops) | EXPLORE at AAMAS ('14, '15, '16, '17) |
| | Adversarial Reasoning in Multi-agent Systems at AAMAS ('17) |
| | Opinion Aggregation, Dynamics, and Elicitation (WADE) at EC ('18) |
| | Mechanism Design for Social Good (MD4SG) at EC ('18) |
| Reviewer | AAAI ('14, '16) |
| | AAMAS ('12, '16) |
| | ADT ('15) |
| | CPAIOR ('13) |
| | EC ('12) |
| | IJCAI ('15) |
| | NIPS ('16, '17, '18) |
| | SODA ('17) |
| | TARK ('17) |
| Session Chair | INFORMS ('14, '15, '16), IOS ('16), AAAI ('13) |
| Travel Grant | AAMAS ('12, '14), AAAI ('13, '15), SoCS ('13) |

## Journals

Reviewer  Management Science
Operations Research
Journal of Artificial Intelligence Research (JAIR)
European Journal of Operations Research (EJOR)
International Journal of Production Research (IJPR)
Annals of Mathematics and Artificial Intelligence (AMAI)
Computers & Operations Research (COR)
Mathematical Social Sciences (MSS)
Artificial Intelligence Review (AIRE)
ACM Transactions on Intelligent Systems and Technology (TIST)

## University Service

| | | |
|---|---|---|
| AY2018–*Present* | UMD | Director, High School Programming Competition |
| AY2017–*Present* | UMD | Diversity Committee |
| AY2017–*Present* | UMD | Faculty board member, ML@UMD |
| AY2016–*Present* | UMD | Artificial Intelligence Field Committee |
| AY2016–*Present* | UMD | High School Student Matching & Placement Committee |
| AY2017–18 | UMD | Faculty Hiring Committee |
| AY2017–18 | UMD | Teaching Awards Committee |
| AY2016–17, 17–18 | UMD | PhD Admissions Committee |
| 2017 | UMD | Judge, Daemon Dash Hackathon |
| AY2012–13, 13–14 | CMU | Admissions Committee |
| 2012 | CMU | Visit Weekend planning committee |
| 2012 | CMU | President of Dec/5 (SCS graduate student organization) |
| 2011, 2012 | CMU | Artificial Intelligence Reading Group (AIRG) planning |