

# John P Dickerson

## Curriculum Vitae

November 2017

Address: Department of Computer Science  
University of Maryland  
College Park, MD 20742.  
Email: john@cs.umd.edu  
WWW: jpdickerson.com  
Phone: (240) 715-2514

### Work Experience

2016–Present	U. of Maryland	Assistant Professor, Department of Computer Science & UMIACS
	<i>Affiliation</i>	Applied Math/Stats and Scientific Computation (AMSC) program
	<i>Affiliation</i>	Human-Computer Interaction Lab (HCIL)
2012–Present	Optimized Markets	Algorithms & optimization consultant
2010–Present	OPTN/UNOS	Algorithms consultant for national kidney exchange
2010–2016	CMU	Research Assistant, Electronic Marketplaces Lab
2008–2012	UMD	Researcher, Lab for Computational Cultural Dynamics (LCCD)
2005	IBM	Global Contract Preparation System (GCPS)
2003–2004	NSA	Bioinformatics and security R&D, <i>cleared TS/SCI</i>

### Education

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, applied computational economics, market design, 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 & Grants

2016–2018	Ministry of Defense (Israel) grant awarded for “Functional Targeting of Terror Networks: A Big Data Approach,” PI transfer from V.S. Subrahmanian		\$150,000
2015–2017	Facebook Fellowship	Full tuition, fees, & stipend for 2 years	\$159,606
2015–2016	Siebel Scholarship	93 top students from leading graduate schools worldwide	\$35,000
2012–2015	NDSEG Fellowship	Full tuition, fees, & stipend for 3 years	\$218,410
2014	NSF SBIR Phase I	Principal Investigator, Award #1345567	\$150,000
2014	FutureMatch, our framework for dynamic matching, won HPCWire’s “Best Data-Intensive Application” award (joint with Pittsburgh Supercomputing Center)		
2014	“Price of Fairness in Kidney Exchange” ranked among best 10% of accepted papers at AAMAS		
2013	“Throwing Darts: Random Sampling Helps Tree Search when the Number of Short Certificates is Moderate” ranked among best 15% of accepted papers at SoCS		
Ongoing	Travel Funds	AAAI, AAMAS, SoCS, CMU	\$3,860

### Selected Projects

#### 2010+: Kidney Exchange

Kidney exchange is a type of barter exchange, and presents many interesting problems in optimization and mechanism design. I am particularly interested in bridging the gap between kidney exchange theory and practice, with an emphasis on *dynamic* kidney exchange, where the matching algorithm must take into account possible futures when matching in the now. I developed a framework that automatically strikes a balance between equitable and efficient matching in a dynamic model (while necessarily keeping human policymakers “in the loop”). I have also shown that incorporating the possibility of post-algorithmic match failures into the optimization problem itself both

increases the number of transplants in expectation and makes the clearing problem—implemented via a custom branch-and-price integer program solver—easier to solve. I am currently exploring the effect on global welfare and participants' incentives of multiple competing exchanges in a dynamic model, as well as multi-organ exchange. I work with a variety of fielded kidney exchanges in the United States and internationally.

**Media Coverage:** The first nationwide kidney exchange took place in Nov. 2010, and was covered by the *International Business Times*. See the CMU press releases in [November](#) and [December](#). Future-Match, our data-driven framework that learns to match in dynamic environments, won HPCWire's 2014 Award for Best Data-Intensive Application (joint with the Pittsburgh Supercomputing Center; we tied with IBM Watson). The announcement is available [here](#), with a CMU press release [here](#).

**Relevant Publications:** [11, 10, 12, 14, 15, 16, 17, 20, 21, 23, 26, 27, 49, 51, 58, 59, 80, 81, 82, 83, 94, 95, 96, 97]

### 2011+: Dynamic Clearing & Automated Abstraction in TV Advertising

Can we use automated abstraction to deal with channel explosion in online and television advertising markets? In the case where bidders bid asynchronously and bids (possibly in the form of complex campaigns) can be accepted or rejected in an online fashion, can we tractably look to the future to yield better expected revenue for the seller or fairness for the bidder(s)? I'm exploring trade-offs between optimality and tractability in the context of dynamic market clearing of campaigns and abstraction of concrete channels.

Toward this end, I'm building an optimization engine and cloud-based combinatorial market system for selling television advertising campaigns. Our system is in the proof-of-concept stage with one of the world's largest cable operators (MSOs). The technology applies to cable operators (MSOs), broadcast networks, cable networks, TV over Internet, and cross-media advertising.

*This research is being performed in part with Optimized Markets, Inc.*

### 2007+: National Security & Counterterrorism

*Science*, *Scientific American*, *The Register*, *R&D Magazine*, and many others covered my work on how virtual worlds can be used to help policy and defense analysts. See my paper in *Science* ([link](#)), my interview in *Scientific American* ([link](#)), or coverage in the satirical magazine *The Register* ([link](#)). My more recent work in this area uses data mining and machine learning techniques to predict group behavior, with an extensive case study focusing on Lashkar-e-Taiba, a well-known South Asian terror group responsible for (among other attacks) the 2008 bombings in Mumbai.

**Relevant Publications:** [5, 19, 25, 28, 34, 39, 46, 53, 54, 55, 56]

### 2009–2012: IED Cache Detection

The Spatial-Cultural Abductive Reasoning Engine (SCARE) is a project I helped develop that analyzes patterns of improvised explosive device (IED) attacks in a war zone. The final product was tested in Afghanistan and deployed elsewhere.

**Media Coverage** *Nature*, *Popular Science*, *The Baltimore Sun*, and many others covered SCARE. See the articles in *Popular Science* ([link](#)) and *The Baltimore Sun* ([link](#)). The *Nature* article is [here](#).

**Relevant Publications:** [38, 57]

## Advising & Mentorship

### Ph.D. Students

- Duncan McElfresh (Mathematics, 2017–)
- Candice Schumann (Computer Science, 2017–)
- Neal Gupta (Computer Science, 2017–)

### Undergraduate Students

- Samsara Counts (GWU, 2017–, UMD Summer REU): deep reinforcement learning for matching markets

- Cameron Moy (UMD, 2017–, UMD Summer REU): deep reinforcement learning for matching markets
- Linyi Xi (Haverford, 2017–, UMD Summer REU): deep reinforcement learning for matching markets
- Ayman Karim (UMD, 2016–): using sentiment and social network analysis to predict winners in WWE matches
- Aditya Mithas (UMD, 2016–): deep reinforcement learning for matching markets
- Kevin Schechter (UMD, 2016–): prediction markets
- Benjamin Plaut (CMU, 2015–2016, next position: Stanford Computer Science Ph.D. program): combinatorial optimization and kidney exchange

### High School Students

- Naveen Durvasula (Montgomery Blair, 2016–, co-advised with Aravind Srinivasan): mechanism design and Bayesian optimization for kidney exchange. Naveen was an Intel International Science and Engineering Fair (ISEF) Finalist in 2017, and won the Ashtavadhani Vidwan Ambati Subbaraya Chetty Foundation Second Award at Intel ISEF in 2017.

### Thesis Proposal & Defense Committees

- Andrew Ruef (UMD, proposed in 2017)
- Pan Xu (UMD, proposed in 2017)
- Eric Krokos (UMD, proposed in 2017)
- Zhuoshu Li (WashU, proposed in 2017)
- Srijan Kumar (UMD, defended in 2017, next position: post-doc at Stanford Computer Science)

## Publications

### Working papers

1. Cui, G, JP Dickerson, N Durvasula, W Gasarch, E Metz, N Raman, and SH Yoo (2017). The Muffin Problem. *CoRR* **abs/1709.02452**. Working paper.
2. Rosemarin, H, JP Dickerson, and S Kraus (2017). Learning to Schedule Deadline- and Operator-Sensitive Tasks. *CoRR* **abs/1706.06051**. Working paper.
3. Schumann, C, SN Counts, J Foster, and JP Dickerson (2017). The Diverse Cohort Selection Problem: Multi-Armed Bandits with Varied Pulls. *CoRR* **abs/1709.03441**. Working paper.
4. 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, A Srinivasan, and P Xu (2018). Allocation Problems in Ride-Sharing Platforms: Online Matching with Offline Reusable Resources. In: *Conference on Artificial Intelligence (AAAI)*.
2. 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)*.
3. McElfresh, D and JP Dickerson (2018). Balancing Lexicographic Fairness and a Utilitarian Objective with Application to Kidney Exchange. In: *Conference on Artificial Intelligence (AAAI)*.

4. Ahmed, F, JP Dickerson, and M Fuge (2017). Diverse Weighted Bipartite b-Matching. In: *International Joint Conference on Artificial Intelligence (IJCAI)*.
5. Dickerson, JP, AM Kazachkov, AD Procaccia, and T Sandholm (2017). Small Representations of Big Kidney Exchange Graphs. In: *Conference on Artificial Intelligence (AAAI)*.
6. Farina, G, JP Dickerson, and T Sandholm (2017). Operation Frames and Clubs in Kidney Exchange. In: *International Joint Conference on Artificial Intelligence (IJCAI)*.
7. 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)*.
8. Plaut, B, JP Dickerson, and T Sandholm (2016). Fast Optimal Clearing of Capped-Chain Barter Exchanges. In: *Conference on Artificial Intelligence (AAAI)*.
9. 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)*.
10. Das, S, JP Dickerson, Z Li, and T Sandholm (2015). Competing Dynamic Matching Markets. In: *Conference on Auctions, Market Mechanisms, and Their Applications (AMMA)*.
11. 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)*.
12. 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)*.
13. 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)*.
14. 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)*.
15. 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)*.
16. 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)*.
17. 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)*.
18. Dickerson, JP, AD Procaccia, and T Sandholm (2013). Failure-Aware Kidney Exchange. In: *Conference on Economics and Computation (EC)*.
19. 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.
20. 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)*.
21. Dickerson, JP, AD Procaccia, and T Sandholm (2012). Dynamic Matching via Weighted Myopia with Application to Kidney Exchange. In: *Conference on Artificial Intelligence (AAAI)*.
22. 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)*.
23. 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)*.
24. 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. Dickerson, JP, AD Procaccia, and T Sandholm (2018). Failure-Aware Kidney Exchange. *Management Science*. To appear.
2. 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*.

3. Dickerson, JP and T Sandholm (2017). Multi-Organ Exchange: The Whole is Greater than the Sum of its Parts. *Journal of Artificial Intelligence Research (JAIR)*. To appear.
4. 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*.
5. 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)*.
6. 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**.
7. Simari, GI, JP Dickerson, A Sliva, and V Subrahmanian (2013). Parallel Abductive Query Answering in Probabilistic Logic Programs. *ACM Transactions on Computational Logic (TOCL)*.
8. 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.
9. 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.
10. 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. 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*.
2. 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*.
3. 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*.
4. 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*.
5. 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*.
6. 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*.
7. Banaszak, S, E Bowman, JP Dickerson, and V Subrahmanian (2014). Forecasting Country Stability in North Africa. In: *Joint Intelligence & Security Informatics Conference (JISIC)*.
8. Dickerson, JP (2014). Robust Dynamic Optimization with Application to Kidney Exchange. In: *Doctoral Consortium at AAMAS-2014*.
9. 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*.
10. 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*.
11. 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*.
12. 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)*.
13. 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)*.
14. 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*.
15. 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. 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).
2. 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).
3. 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 (2017). *Better Matching Markets Through Optimization*. Invited talk, United States Naval Academy (USNA).
2. Dickerson, JP (2017). *Better Matching Markets Through Optimization*. Invited talk, Laboratory for Telecommunication Sciences (LTS).
3. Dickerson, JP (2017). *Better Matching Markets Through Optimization*. Invited talk, Stanford University.
4. Dickerson, JP (2017). *Better Matching Markets Through Optimization*. Invited talk, University of British Columbia.
5. Dickerson, JP (2017). Recent Advances in Optimization and Machine Learning for Kidney Exchange. In: *INFORMS Healthcare Conference*. Invited talk.
6. Dickerson, JP (2016). *Better Matching Markets Through Optimization*. Invited talk, Duke University.
7. Dickerson, JP (2016). Small Representations of Big Kidney Exchange Graphs. In: *INFORMS Annual Conference*. Invited talk, Healthcare Applications Society cluster.
8. Dickerson, JP (2016). Small Representations of Big Kidney Exchange Graphs. In: *28th European Conference on Operational Research (EURO)*. Invited talk, Healthcare Logistics stream.
9. Dickerson, JP (2016). *Swapping Kidneys: Better Matching Market Design via Optimization*. Invited talk, Data Science DC.
10. Dickerson, JP (2016). Toward a Credit-Based Mechanism for Dynamic Kidney Exchange. In: *INFORMS Annual Conference*. Invited talk, Auctions cluster.
11. Dickerson, JP (2016). Uncertainty in Dynamic Matching with Application to Organ Exchange. In: *INFORMS Annual Conference*. Invited talk.
12. 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.
13. Das, S, JP Dickerson, Z Li, and T Sandholm (2015). Competing Dynamic Matching Markets. In: *INFORMS Annual Conference*. Invited talk, Auctions cluster.
14. 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.
15. 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.
16. Dickerson, JP (2015). Near-optimal Stochastic Matching With Few Queries. In: *INFORMS Annual Conference*. Invited talk, Auctions cluster.
17. Dickerson, JP (2015). The Dynamics of Kidney Exchange. In: *Production and Operations Management Society (POMS) Annual Conference*. Invited talk, Healthcare Operations Management track.
18. Dickerson, JP (2014). *FutureMatch: Combining Human Value Judgments and Machine Learning to Match in Dynamic Environments*. DB Seminar, Carnegie Mellon University, Pittsburgh, PA.

19. 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.
20. Dickerson, JP (2013). *Failure-Aware Kidney Exchange*. Tsinghua University, Beijing, China.
21. Dickerson, JP, AD Procaccia, and T Sandholm (2013). Failure-Aware Kidney Exchange. In: *INFORMS Annual Conference*. Invited talk, Auctions cluster.
22. 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.
23. 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. 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.
2. Dickerson, JP (2016). Fast Optimal Clearing of Capped-Chain Barter Exchanges. In: *INFORMS Optimization Society (IOS) Conference*.
3. Dickerson, JP (2016). FutureMatch: Combining Human Value Judgments and Machine Learning to Match in Dynamic Environments. In: *World Congress on Game Theory (GAMES)*.
4. Das, S, JP Dickerson, Z Li, and T Sandholm (2015). Competing Dynamic Matching Markets. In: *Conference on Economics and Computation (EC)*. Abstract of poster.
5. 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)*.
6. Dickerson, JP, AD Procaccia, and T Sandholm (2014). Price of Fairness in Kidney Exchange. In: *World Transplant Congress (WTC)*. Abstract of poster.
7. Dickerson, JP and T Sandholm (2014). FutureMatch: Learning to Match in Dynamic Environments. In: *World Transplant Congress (WTC)*. Abstract of poster.
8. Dickerson, JP and T Sandholm (2014). FutureMatch: Learning to Match in Dynamic Environments. In: *Conference on Economics and Computation (EC)*. Abstract of poster.
9. Dickerson, JP and T Sandholm (2014). Toward Multi-Organ Exchange. In: *World Transplant Congress (WTC)*. Abstract of poster.
10. 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.
11. 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.
12. Dickerson, JP and T Sandholm (2013). Liver and Multi-Organ Exchange. In: *INFORMS Annual Conference*. Contributed presentations.
13. Dickerson, JP and T Sandholm (2013). Liver and Multi-Organ Exchange. In: *American Transplant Congress (ATC)*. Abstract of poster.
14. 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)*.
15. 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*.
16. 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.
17. Blusewicz, K, K de Souza, JP Dickerson, B Feldman, A Gaddam, G Ganesan, C Hatch, C Hulseberg, 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.

## Teaching

F2017	Lecturer	UMD	CMSC320	Introduction to Data Science	<i>with Deshpande</i>
S2017	Lecturer	UMD	CMSC320	Introduction to Data Science	
F2016	Lecturer	UMD	CMSC828M	Applied Mechanism Design for Social Good	
2015	Lecturer	CMU	15-892	Foundations of Electronic Marketplaces	<i>with Sandholm</i>
2013	Vertical Mentor	CMU	—	Negotiation, eBusiness Technology	Sandholm
2013	Teaching Asst.	CMU	15-780	Graduate Artificial Intelligence	Sandholm & Veloso
2012	Vertical Mentor	CMU	—	Negotiation, eBusiness Technology	Sandholm
2012	Teaching Asst.	CMU	15-780	Graduate Artificial Intelligence	Hebert & Procaccia
2008	Teaching Asst.	UMD	CMSC311	Computer Organization	Hugue
2007	Teaching Asst.	UMD	CMSC311	Computer Organization	Hugue
2007	Teaching Asst.	UMD	CMSC330	Organization of Prog. Languages	Herman
2006	Teaching Asst.	UMD	CMSC212	Intro to Low-Level Programming	Herman

*In 2007, I was Undergraduate TA of the Year at UMD's Computer Science Department.*

## Service

### Conferences

Organizer	AAAI/SIGAI Job Fair Co-Chair ('17) EXPLORE ('17)
PC Member	AAAI ('13, '17, '18) AAMAS ('17, '18) AISTATS ('17) EC ('17) ICML ('16, '17) IJCAI ('13, '16, '17) EXPLORE ('14, '15, '16, '17) TinyToCS ('12)
Reviewer	AAAI ('14, '16) AAMAS ('12, '16) ADT ('15) CPAIOR ('13) EC ('12) IJCAI ('15) NIPS ('16, '17) 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 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)
----------	--



**University Service**

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

**Programming & Technology****Languages – Fluent**

Java, Python, C++

**Languages – Experienced**

Ruby, C, JavaScript, Matlab, L<sup>A</sup>T<sub>E</sub>X2e, ActionScript, Flex, HTML4+, CSS2+, XML, HAML, YAML, JSON

**Frameworks**

Sinatra, Flask, Rails, Play, Java EE (Servlets on Tomcat or GlassFish), Git, SVN, CVS, TORQUE, MPI  
*I've also extensively used Blacklight, a 4096-core NUMA supercomputer at the Pittsburgh Supercomputing Center, as well as a 1404-core, 116-node cluster at UMD, a 21-node Nvidia Tesla cluster at UMD, and a variety of Amazon AWS services through my work at Optimized Markets and Kidney Match.*

**Environments & Software Suites**

Emacs, Eclipse, NetBeans, Visual Studio, 3d Studio Max, Adobe Creative Suite, Gimp, RubyMine

**References**

Tuomas Sandholm, Ph.D. Professor, Computer Science Carnegie Mellon University Pittsburgh, PA 15213	V.S. Subrahmanian, Ph.D. Professor, Computer Science University of Maryland College Park, MD 20742
Alvin Roth, Ph.D. Professor, Economics Stanford University Stanford, CA 94305	Ariel Procaccia, Ph.D. Asst. Professor, Computer Science Carnegie Mellon University Pittsburgh, PA 15213

*Extra academic and personal references available upon request!*

Last updated: November 2017

[dickerson.john.p.cv.pdf](#)