

RESEARCH INTERESTS

Computational Economics, Algorithmic Mechanism Design, Fair Division, Social Choice, Game Theory, Multiagent Systems.

APPOINTMENTS

Assistant Professor

Aug 2017 - Present

*Department of Computer Science
University of Toronto, Canada*

Postdoctoral Fellow

Sep 2016 - Jul 2017

*Center for Research on Computation and Society (CRCS)
Harvard University, USA*
Supervisors: David C. Parkes and Yiling Chen

EDUCATION

Ph.D. in Computer Science

Aug 2011 - Aug 2016

Carnegie Mellon University, USA
Advisor: Ariel D. Procaccia

B.Tech. in Computer Science with Honors and Minor in Management

Jul 2007 - Apr 2011

Indian Institute of Technology Bombay (IIT Bombay), India
CGPA: 9.94/10.00

SELECTED FELLOWSHIPS & RECOGNITIONS

IFAAMAS Victor Lesser Distinguished Dissertation Award

2016

Awarded annually to the best dissertation in the area of Autonomous Agents or Multiagent Systems.

Facebook Graduate Fellowship, Facebook Inc.

2014-15

Awarded to 11 Ph.D. students worldwide.

Hima and Jive Graduate Fellowship, Carnegie Mellon University

2013-14

Awarded to one international student in the School of Computer Science (SCS) every year.

President's Gold Medal, IIT Bombay

2011

Awarded for securing the first rank among more than 600 students at IIT Bombay.

RESEARCH INTERNSHIPS & VISITS

Duke University, USA

Mentor: Vincent Conitzer

Jun 2015 - Jul 2015

Research Area: Recommendation Systems

Microsoft Research New York, USA

Mentor: David Pennock

Mentor: Sébastien Lahaie

May 2013 - Aug 2013

Research Area: Prediction Markets

Research Area: Social Choice

Microsoft Research Cambridge, UK

Mentor: Yoram Bachrach & Ian Kash

May 2012 - Aug 2012

Research Area: Cooperative Game Theory

IST Austria, Austria

Mentor: Krishnendu Chatterjee

May 2010 - July 2010

Research Area: Game Theory in Formal Methods

INRIA Sophia Antipolis, France

Mentor: Frédéric Cazals

May 2009 - July 2009

Research Area: Computational Geometry

JOURNAL PUBLICATIONS

- J9. I. Caragiannis, S. Nath, A. D. Procaccia, and N. Shah. *Subset Selection Via Implicit Utilitarian Voting*. Journal of Artificial Intelligence Research (JAIR), Volume 58, pp. 123-152, 2017. Supercedes the IJCAI-16 paper below.
- J8. I. Caragiannis, A. D. Procaccia, and N. Shah. *When Do Noisy Votes Reveal the Truth?* ACM Transactions on Economics and Computation (TEAC), Volume 4, Number 3, Article 15, 2016 (special issue on selected papers from EC-13). Supercedes the EC-13 paper below.
- J7. A. D. Procaccia, N. Shah, and Y. Zick. *Voting Rules as Error-Correcting Codes*. Artificial Intelligence (AIJ), Volume 231, pp. 1-16, 2016. Supercedes the AAAI-15 paper below.
- J6. D. C. Parkes, A. D. Procaccia, and N. Shah. *Beyond Dominant Resource Fairness: Extensions, Limitations, and Indivisibilities*. ACM Transactions on Economics and Computation (TEAC), Volume 3, Number 1, Article 3, 2015 (special issue on selected papers from EC-12). Supercedes the EC-12 paper below.
- J5. K. Chatterjee, M. Henzinger, M. Joglekar, and N. Shah. *Average Case Analysis of the Classical Algorithm for Markov Decision Processes with Büchi Objectives*. Theoretical Computer Science (TCS), Volume 573, pp. 71-89, 2015. Supercedes the FSTTCS-12 paper below.
- J4. I. Kash, A. D. Procaccia, and N. Shah. *No Agent Left Behind: Dynamic Fair Division of Multiple Resources*. Journal of Artificial Intelligence Research (JAIR), Volume 51, pp. 579-603, 2014. Supercedes the AAMAS-13 paper below.
- J3. F. Cazals, T. Dreyfus, S. Sachdeva, and N. Shah. *Greedy Geometric Optimization Algorithms for Collection of Balls*. Computer Graphics Forum (CGF), Volume 33, Issue 6, pp. 1-17, 2014.
- J2. K. Chatterjee, M. Henzinger, M. Joglekar, and N. Shah. *Symbolic Algorithms for Qualitative Analysis of Markov Decision Processes with Büchi Objectives*. Formal Methods in System Design (FMSD), Volume 42, Issue 3, pp. 301-327, 2013. Supercedes the CAV-11 paper below.
- J1. M. Joglekar, N. Shah, and A. Diwan. *Balanced Group-Labeled Graphs*. Discrete Mathematics. Volume 312, Issue 9, pp. 1542-1549, 2012.

ARCHIVAL CONFERENCE PUBLICATIONS

- C28. V. Conitzer, R. Freeman, and N. Shah. *Fair Public Decision Making*. Proc. of 18th ACM Conference on Economics and Computation (EC), pp. 629-646, 2017.
- C27. A. Agarwal, D. Mandal, D. C. Parkes, and N. Shah. *Peer Prediction with Heterogeneous Users*. Proc. of 18th ACM Conference on Economics and Computation (EC), pp. 81-98, 2017.
- C26. G. Benade, A. D. Procaccia, S. Nath, and N. Shah. *Preference Elicitation for Participatory Budgeting*. Proc. of 31st AAAI Conference on Artificial Intelligence (AAAI), pp. 376-382, 2017.
- C25. I. Caragiannis, D. Kurokawa, H. Moulin, A. D. Procaccia, N. Shah, and J. Wang. *The Unreasonable Fairness of Maximum Nash Welfare*. Proc. of 17th ACM Conference on Economics and Computation (EC), pp. 305-322, 2016.
- C24. I. Caragiannis, A. D. Procaccia, and N. Shah. *Truthful Univariate Estimators*. Proc. of 33rd Intl. Conference on Machine Learning (ICML), pp. 127-135, 2016.
- C23. I. Caragiannis, S. Nath, A. D. Procaccia, and N. Shah. *Subset Selection Via Implicit Utilitarian Voting*. Proc. of 25th Intl. Joint Conference on Artificial Intelligence (IJCAI), pp. 151-157, 2016.
- C22. M. Brill, V. Conitzer, R. Freeman, and N. Shah. *False-Name-Proof Recommendations in Social Networks*. Proc. of 15th Intl. Joint Conference on Autonomous Agents and Multiagent Systems (AAMAS), pp. 332-340, 2016.
- C21. A. D. Procaccia, and N. Shah. *Optimal Aggregation of Uncertain Preferences*. Proc. of 30th AAAI Conference on Artificial Intelligence (AAAI), pp. 608-614, 2016.
- C20. A. D. Procaccia, and N. Shah. *Is Approval Voting Optimal Given Approval Votes?* Proc. of 29th Annual Conference on Neural Information Processing Systems (NIPS), pp. 1792-1800, 2015.
- C19. D. Kurokawa, A. D. Procaccia, and N. Shah. *Leximin Allocations in the Real World*. Proc. of 16th ACM Conference on Economics and Computation (EC), pp. 345-362, 2015.
- C18. A. D. Procaccia, N. Shah, and E. Sodomka. *Ranked Voting on Social Networks*. Proc. of 24th International Joint Conference on Artificial Intelligence (IJCAI), pp. 2040-2046, 2015.
- C17. A. D. Procaccia, N. Shah, and Y. Zick. *Voting Rules as Error-Correcting Codes*. Proc. of 29th AAAI Conference on Artificial Intelligence, pp. 1000-1006, 2015.
- C16. A. X. Jiang, L. S. Marcolino, A. D. Procaccia, T. Sandholm, N. Shah, and M. Tambe. *Diverse Randomized Agents Vote to Win*. Proc. of 28th Annual Conference on Neural Information Processing Systems (NIPS), pp. 2573-2581, 2014.
- C15. E. Elkind, and N. Shah. *Electing the Most Probable Without Eliminating the Irrational: Voting Over Intransitive Domains*. Proc. of 30th Conference on Uncertainty in Artificial Intelligence (UAI), pp. 182-191, 2014.
- C14. S. Lahaie, and N. Shah. *Neutrality and Geometry of Mean Voting*. Proc. of 15th ACM Conference on Electronic Commerce (EC), pp. 333-350, 2014.
- C13. I. Caragiannis, A. D. Procaccia, and N. Shah. *Modal Ranking: A Uniquely Robust Voting Rule*. Proc. of 28th AAAI Conference on Artificial Intelligence (AAAI), pp. 616-622, 2014.
- C12. W. Kets, D. M. Pennock, R. Sethi, and N. Shah. *Betting Strategies, Market Selection, and the Wisdom of Crowds*. Proc. of 28th AAAI Conference on Artificial Intelligence (AAAI), pp. 735-741, 2014.

- C11. A. D. Procaccia, N. Shah, and M. L. Tucker. *On the Structure of Synergies in Cooperative Games*. Proc. of 28th AAAI Conference on Artificial Intelligence (AAAI), pp. 763-769, 2014.
- C10. Y. Bachrach, R. Savani, and N. Shah. *Cooperative Max Games and Agent Failures*. Proc. of 13th Intl. Joint Conference on Autonomous Agents and Multiagent Systems (AAMAS), pp. 29-36, 2014.
- C9. I. Caragiannis, A. D. Procaccia, and N. Shah. *When Do Noisy Votes Reveal the Truth?*. Proc. of 14th ACM Conference on Electronic Commerce (EC), pp. 143-160, 2013.
- C8. A. X. Jiang, A. D. Procaccia, Y. Qian, N. Shah, and M. Tambe. *Defender (Mis)coordination in Security Games*. Proc. of 23rd International Joint Conference on Artificial Intelligence (IJCAI), pp. 220-226, 2013.
- C7. A. D. Procaccia, I. Kash, and N. Shah. *No Agent Left Behind: Dynamic Fair Division of Multiple Resources*. Proc. of 12th International Conference on Autonomous Agents and Multiagent Systems (AAMAS), pp. 351-358, 2013.
- C6. Y. Bachrach, and N. Shah. *Reliability Weighted Voting Games*. Proc. of 6th International Symposium on Algorithmic Game Theory (SAGT), pp. 38-49, 2013.
- C5. D. C. Parkes, A. D. Procaccia, and N. Shah. *Beyond dominant resource fairness: extensions, limitations, and indivisibilities*. Proc. of 13th ACM Conference on Electronic Commerce (EC), pp. 808-825, 2012.
- C4. A. D. Procaccia, S. J. Reddi, and N. Shah. *A Maximum Likelihood Approach For Selecting Sets of Alternatives*. Proc. of 28th Conference on Uncertainty in Artificial Intelligence (UAI), pp. 695-704, 2012.
- C3. Y. Bachrach, I. Kash, and N. Shah. *Agent Failures in Totally Balanced Games and Convex Games*. Proc. of 8th Workshop on Internet & Network Economics (WINE), pp. 15-29, 2012.
- C2. K. Chatterjee, M. Henzinger, M. Joglekar, and N. Shah. *Average Case Analysis of the Classical Algorithm for Markov Decision Processes with Büchi Objectives*. Proc. of 32nd Conference on Foundations of Software Technology and Theoretical Computer Science (FSTTCS), pp. 461-473, 2012.
- C1. K. Chatterjee, M. Henzinger, M. Joglekar, and N. Shah. *Symbolic Algorithms for Qualitative Analysis of Markov Decision Processes with Büchi Objectives*. Proc. of 23rd International Conference on Computer Aided Verification (CAV), pp. 260-276, 2011.

PROFESSIONAL SERVICE

Program Committee: EC (2017), AAAI (2017, 2018), IJCAI (2015, 2016, 2017)

Journal Reviewing Activities: JAIR (2014, 2015, 2016), AIJ (2016, 2017), ACM TEAC (2014, 2015, 2016, 2017), Economic Theory (2017), JMLR (2016), SCWE (2015, 2016), JAAMAS (2016), AGNT (2016, 2017), TCS (2016), MathOR (2016), Mathematical Social Sciences (2015, 2016), Optimization Letters (2015), SIAM Journal of Computing (2015), ACM ToMPECS (2015).

Conference Reviewing Activities: EC (2015), SODA (2017), AAMAS (2015, 2017), WINE (2013, 2015), SAGT (2013, 2015), MFCS (2013), AAAI SS (2015), CoopMAS (2016), ComSoC (2016).