

RYAN M. ROGERS

Webpage: <http://www.math.upenn.edu/~ryrogers/>

RESEARCH INTERESTS

- Differential Privacy
- Adaptive Data Analysis
- Machine Learning
- Algorithmic Game Theory
- Algorithms
- Statistics

SKILLS

R, Python, Matlab, Mathematica, SAS, Perl, and Ada 95.

EDUCATION

University of Pennsylvania Philadelphia, PA
Ph.D. Candidate in Applied Mathematics and Computational Science Projected May 2017

- Advisors: Michael Kearns, Aaron Roth.
- Proposal: *Differential Privacy and Mechanism Design*.
- Committee: Rakesh Vohra (Chair), Michael Kearns, Aaron Roth.
- G.P.A. 3.98 / 4.0

University of Cambridge - Clare Hall Cambridge, UK
Part III - Masters of Advanced Study in Applied Mathematics October 2010 - July 2011

- Advisor: Richard Weber.
- Thesis: *Algorithmic Game Theory*.
- Graduated with Distinction (top third).

Stetson University DeLand, FL
B.S. in Mathematics and B.A. in Religious Studies August 2005 - May 2009

- Advisor: Thomas Vogel.
- Thesis: *Using Hamilton's Principle to Approximate Soliton Solutions to Nonlinear PDEs*.
- G.P.A. 3.93 / 4.0.

University of Oxford - Magdalen College Oxford, UK
Study Abroad - Visiting Student October 2007 - December 2007

- G.P.A. 4.0 / 4.0.

WORK EXPERIENCE

Microsoft Research New York, NY
Research Intern - Mentors: Sébastien Lahaie, and Jenn Wortman Vaughan *Summer 2016*

- Collaborated with mentors and Miro Dudík on prediction markets.

Harvard University - Privacy Tools Project Cambridge, MA
Research Assistant - worked with Prof. Salil Vadhan *Summer 2015, 2016*

- Mentored interns to conduct private statistical hypothesis tests on medical data.
- Implemented a new private statistical test based on the Chi-Square test for independence.
- Created new tools in R for privately releasing contingency tables from sensitive datasets.

Milliman - Denver Health Denver, CO
Actuary Intern *May 2012 - August 2012*

- Managed large data files using SAS and Excel macros to conduct statistical analysis.
- Presented a regression technique to fill missing entries in medical databases.

United Space Alliance (USA) Johnson Space Center, TX
Computer Scientist *December 2009 - October 2010*

- Worked on the Space Station Training Facility (SSTF) at NASA Johnson Space Center.
- Repaired thermal model of the onboard computers for the SSTF.
- Analyzed, corrected, and tested NASA anomaly reports that were reported to USA.
- Developed software that facilitated program checks for SSTF testing sessions.

NASA Kennedy Space Center, FL
USRP Intern *May 2007 - August 2007*

- Constructed a white light interferometer to measure small defects in the Shuttle's windows.
- Compiled a deliverable for USRP focusing on the White Light Interferometer.

PUBLICATIONS (ALPHABETICAL AUTHORSHIP)

M. Dudík, S. Lahaie, R. Rogers, J. Wortman Vaughan. *A Decomposition of Forecast Error in Prediction Markets*. In submission.

D. Kifer, R. Rogers. *A New Class of Private Chi-Square Tests*. To appear in the proceedings of the International Conference on Artificial Intelligence and Statistics 2017.

R. Rogers, A. Roth, J. Ullman, S. Vadhan. *Privacy Odometers and Filters: Pay-as-you-Go Composition*. In the proceedings of the conference on Neural Information Processing Systems 2016.

R. Rogers, A. Roth, A. Smith, O. Thakkar. *Max-Information, Differential Privacy, and Post-Selection Hypothesis Testing*. In the proceedings of the Foundations of Computer Science 2016.

M. Gaboardi, H. Lim, R. Rogers, S. Vadhan. *Differentially Private Chi-Square Hypothesis Testing*. In the proceedings of the International Conference on Machine Learning 2016.

M. Kearns, M. Pai, R. Rogers, A. Roth, J. Ullman. *Robust Mediators in Large Games*. In submission.

J. Morgenstern, J. Hsu, R. Rogers, A. Roth, R. Vohra. *Do Prices Coordinate Markets?* In the proceedings of the Symposium on Theory of Computing 2016.

- Invited to SIGecom exchanges.

S. Jabbari, R. Rogers, A. Roth, and Z. S. Wu. *Learning from Rational Behavior: Predicting Solutions to Unknown Linear Programs*. In the proceedings of the conference on Neural Information Processing Systems 2016.

R. Rogers, A. Roth, J. Ullman, and Z. S. Wu. *Inducing Approximately Optimal Flow using Truthful Mediators*. In the proceedings of the conference on Economics and Computation 2015.

S. Kannan, J. Morgenstern, R. Rogers, and A. Roth. *Private Pareto Optimal Exchange*. In the proceedings of the conference on Economics and Computation 2015.

- Invited to special issue of Transactions on Economics and Computation.

R. Rogers and A. Roth. *Asymptotically Truthful Equilibrium Selection in Large Congestion Games*. In the proceedings of the conference on Economics and Computation 2014.

R. Rogers and T. Vogel. *Identification of Localized Structure in a Nonlinear Damped Harmonic Oscillator using Hamilton's Principle*. *Involve - A Journal of Mathematics*, 2010.

TEACHING EXPERIENCE

University of Pennsylvania

Teacher's Assistant - prepared recitations, quizzes, homework, and exams.

- Networked Life *Fall 2014*
 - No separate evaluation for TAs given.
- Advanced Calculus II *Spring 2014*
 - Evaluation: 2.94/4 actual vs 2.73/4 course average
- Differential Equations - Linear Algebra *Fall 2013*
 - Evaluation: 3.37/4 actual vs 2.76/4 course average

University of Colorado at Boulder

Teacher's Assistant - prepared recitations, quizzes, homework, and exams.

- Multivariable Calculus *Spring 2012*
 - Evaluation: 4.94/6 actual vs 4.69/6 course average
- Calculus II *Fall 2011*
 - Evaluation: 5.11/6 actual vs 4.68/6 course average

SELECTED TALKS

Leveraging Privacy in Data Analysis.

- Microsoft Research, Redmond, WA *January 2017*
- Sandia National Labs, Albuquerque, NM *January 2017*
- New York Area Theory Day - New York, NY *December 2016*

Understanding Errors in Prediction Markets.

- Microsoft Research Tea Talk - New York, NY *September 2016*

Max-Information, Differential Privacy, and Post-Selection Hypothesis Testing.

- Workshop on Adaptive Data Analysis NIPS - Barcelona, Spain *December 2016*
- Symposium on Foundations of Computer Science - New Brunswick, NJ *October 2016*
- Northeastern University Theory Seminar - Boston, MA *June 2016*

Differentially Private Chi-Square Hypothesis Testing

- International Conference on Machine Learning - New York, NY *June 2016*
- Harvard University Privacy Tools Project Meeting - Cambridge, MA *April 2016*
- Penn State Theory Seminar - State College, PA *November 2015*

Do Prices Coordinate Markets?

- SIAM Annual Meeting - Boston, MA *July 2016*
- Symposium on Theory of Computing - Cambridge, MA *June 2016*
- Google Theory Seminar - New York, NY *November 2015*

Mechanism Design in Large Congestion Games

- Harvard University Theory Seminar - Cambridge, MA *July 2015*

Inducing Approximately Optimal Flow using Truthful Mediators

- Workshop on The Theory of Bringing Privacy into Practice - Pasadena, CA *April 2015*

Private Pareto Optimal Exchange

- Conference on Economics and Computation - Portland, OR *June 2015*
- SIAM Student Research Symposium - Philadelphia, PA *November 2014*

Asymptotically Truthful Equilibrium Selection in Large Congestion Games

- Conference on Economics and Computation - Palo Alto, CA *June 2014*

POSTER PRESENTATIONS

Privacy Odometers and Filters: Pay-as-you-Go Composition.

- Conference on Neural Information Processing Systems - Barcelona, Spain *December 2016*

Learning from Rational Behavior: Predicting Solutions to Unknown Linear Programs

- Conference on Neural Information Processing Systems - Barcelona, Spain *December 2016*

Leveraging Privacy in Data Analysis and Mechanism Design

- Conference on Web and Internet Economics - Montreal, Canada *December 2016*
- SIGAI Career Network and Conference - Boston, MA *October 2016*

Max-Information, Differential Privacy, and Post-Selection Hypothesis Testing

- Workshop on Theory and Practice of Differential Privacy - New York, NY *June 2016*

Differentially Private Chi-Square Hypothesis Testing

- International Conference on Machine Learning - New York, NY *June 2016*

Do Prices Coordinate Markets?

- New York Computer Science and Economics Day - New York, NY *January 2015*

Inducing Approximately Optimal Flow using Truthful Mediators

- SIAM CSE Conference - Salt Lake City, UT *March 2015*
- New York Computer Science and Economics Day - New York, NY *December 2014*

AWARDS AND HONORS

Best Poster Award sponsored by HP Labs at SIAM CSE 2015 conference	<i>2015</i>
Benjamin Franklin Doctoral Fellowship - University of Pennsylvania	<i>2012-2014</i>
Gene W. Medlin Award for outstanding senior research in Mathematics - Stetson	<i>2009</i>
Presented at the Mathematical Association of America Conference - Fort Myers, FL	<i>2009</i>
Ashcraft Award - cash prize for outstanding Junior in Mathematics - Stetson University	<i>2007</i>
Inducted into Phi Beta Kappa National Honor Society - Stetson University	<i>2007</i>
Florida Bright Futures Scholarship	<i>2005-2009</i>

SERVICE/LEADERSHIP

Reviewer

- ACM SIAM Symposium on Discrete Algorithms 2017 - *subreviewer*
- Conference on Web and Internet Economics 2016 - *subreviewer*
- Conference on Neural Information Processing Systems 2016
- Theory of Computing
- ACM Transactions on Economics and Computation

- Journal of the Royal Statistical Society
- Journal of Privacy and Confidentiality
- Transactions on Emerging Telecommunication Technologies
- Transactions on Information Forensics and Security

President of SIAM Student Chapter

University of Pennsylvania

Philadelphia, PA

2013-2016

- Secured several grants for the student chapter from SIAM and created the SIAM Student Research Symposium at Penn.
- Co-founder of the SIAM Student Chapter at the University of Pennsylvania.

Sports Officer for Graduate Student Body

University of Cambridge - Clare Hall

Cambridge, UK

2010-2011

- Allocated sport funds to different college teams.
- Published a sports report in the college bulletin.

Rowing

- Coach for Wharton Crew *2014-2016*
- Rowed competitively with the following crews:
 - Fairmount Rowing Assoc. *2014-2016*
 - Wharton Crew - University of Pennsylvania *2012 - 2016*
 - Clare Hall Boat Club - University of Cambridge *2010 - 2011*
 - Stetson University *2007 - 2009*
 - Magdalen College Boat Club - University of Oxford *Fall 2007*

GRADUATE COURSEWORK

University of Pennsylvania

- Functional Analysis, Complex Analysis, Probability, Stochastic Processes, Applied Algebra, Representation Theory and Numerical Linear Algebra, No Regrets in Game Theory and Machine Learning, Discrete Convexity and Submodularity, Algorithms, Computational Complexity Theory, Differential Privacy in Game Theory and Mechanism Design, Bayesian Analysis

University of Colorado at Boulder

- Numerical Analysis I and II, Applied Analysis I and II, Time Series

University of Cambridge

- Numerical Solutions of Differential Equations, Operations Research, Stochastic Networks, Biostatistics, Applied Bayesian Statistics, Quantum Computation