

Faculty Personnel Record

Rocco A. Servedio

Professor of Computer Science
Chair, Department of Computer Science
Columbia University, New York, NY 10027

Website: <http://www.cs.columbia.edu/~rocco>

Telephone: 212.939.7004

Email: rocco@cs.columbia.edu

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Education:

<u>School</u>	<u>Degree</u>	<u>Date</u>
Harvard University	Ph.D., Computer Science	2001
Harvard University	M.S., Computer Science	1997
Harvard University	A.B., Mathematics, <i>summa cum laude</i>	1993

Title of Ph.D. Thesis:

Efficient Algorithms in Computational Learning Theory
(Advisor: Leslie Valiant)

Principal Field of Specialization: Theoretical computer science: computational complexity theory, computational learning theory, sub-linear time algorithms and property testing, randomness in computing

Career History:

- Columbia University, Chair, Department of Computer Science July 2018 – present
- Columbia University, Professor of Computer Science 2017 – present
- Columbia University, Interim Chair, Department of Computer Science July 2015 – Dec 2015
- Columbia University, Vice-Chair, Department of Computer Science 2012 – 2018
- Columbia University, (tenured) Associate Professor of Computer Science 2010 – 2016
- Princeton University, Visiting Fellow (sabbatical) 2010 – 2011
- Columbia University, Associate Professor of Computer Science 2007 – 2009
- Columbia University, Assistant Professor of Computer Science 2003 – 2006
- Harvard University, Lecturer in Applied Mathematics 2002
- National Science Foundation Mathematical Sciences Postdoctoral Fellow 2001 – 2002
Harvard University
Postdoctoral Advisor: Leslie Valiant

Current Professional Organization Membership:

- Association for Computing Machinery (ACM), Special Interest Group on Algorithms and Computation Theory (SIGACT)
- Institute of Electrical and Electronics Engineers (IEEE)

Awards Received:*Internal:*

- 2013 Columbia University Presidential Teaching Award (5 recipients out of 500+ nominations) 2013
- Columbia Engineering Alumni Association Distinguished Faculty Teaching Award 2010
- Columbia Computer Science Department Distinguished Teaching Award 2010
- Charles and Jennifer Johnson Best Student Paper Prize, Massachusetts Institute of Technology Department of Mathematics (with co-author Adam Klivans) 2001
- Division of Engineering and Applied Sciences Teaching Fellow Award, Harvard University 2000
- Certificate of Distinction in Teaching, Harvard University 1997,1998,1999

External:

- Best Paper Award, 32nd Conference on Computational Complexity (**CCC**) (with coauthors X. Chen, L.-Y. Tan, E. Waingarten and J. Xie; one paper selected out of 98 submissions) 2017
- Best Paper Award, 56th Annual IEEE Symposium on Foundations of Computer Science (**FOCS**) (with coauthors B. Rossman and L.-Y. Tan; one paper selected out of 314 submissions) 2015
- IBM Research Pat Goldberg Math/CS/EE Best Paper Award (with co-authors A. De, I. Diakonikolas and V. Feldman; one of three winners out of ~ 100 eligible papers by IBM researchers) 2014
- Google Research Awards 2008, 2010
- E. M. Gold Best Student Paper Award, 17th International Conference on Algorithmic Learning Theory (**ALT**) (with Ph.D. student Alp Atici) 2006
- Mark Fulk Best Student Paper Award, 19th Annual Conference on Learning Theory (**COLT**) (with Ph.D. students Homin Lee and Andrew Wan) 2006
- Alfred P. Sloan Foundation Fellowship 2005
- NSF Faculty CAREER Award 2004
- Best Paper Award, 18th Annual IEEE Conference on Computational Complexity (**CCC**) (with coauthor R. O'Donnell; one paper selected out of 65 submissions) 2003
- Best Student Paper Award, 33rd ACM Symposium on Theory of Computing (**STOC**) 2001
- Best Student Paper Award, 13th ACM Conference on Computational Learning Theory (**COLT**) 2000
- NSF Graduate Research Fellowship 1996
- Phi Beta Kappa, Harvard University 1993

Invited Papers:

- “Settling the query complexity of non-adaptive junta testing” invited to *Journal of the ACM* (as **CCC** 2017 best paper) 2017
- “Poly-logarithmic Frege depth lower bounds via an expander switching lemma” invited to *SIAM J. Computing* special issue for **STOC** 2016 2016
- “An average-case depth hierarchy for Boolean circuits” invited to *Journal of the ACM* (**FOCS** 2015 Best Paper invitation) 2015
- “An average-case depth hierarchy for Boolean circuits” invited to *SIAM J. Computing* special issue of selected papers from **FOCS** 2015 (declined) 2015
- “Learning Poisson Binomial Distributions” invited to *Algorithmica* special issue on Machine Learning 2013
- “Nearly optimal solutions for the Chow parameters problem and low weight approximation of halfspaces” invited to *Theory of Computing* special issue on Analysis of Boolean Functions (declined) 2012
- “Testing Fourier dimensionality and sparsity” invited to *Theoretical Computer Science* special issue of selected papers from **ICALP** 2009 (declined) 2009
- “Every linear threshold function has a low-weight approximator” invited to *Computational Complexity* special issue of selected papers from **CCC** 2006 2006
- “Learning Monotone Decision Trees in Polynomial Time” invited to *Computational Complexity* special issue of selected papers from **CCC** 2006 (declined) 2006
- “Learning Unions of $\omega(1)$ -Dimensional Rectangles” invited to *Theoretical Computer Science* special issue of selected papers from **ALT** 2006 2006
- “DNF are Teachable in the Average Case” invited to *Machine Learning Journal* special issue of selected papers from **COLT** 2006 2006
- “Every Decision Tree has an Influential Variable” invited to *Journal of Computer & System Sciences* special issue on Learning Theory (declined) 2006
- Invited paper (“On PAC Learning Algorithms for Rich Boolean Function Classes”) at *3rd Annual Conference on Theory and Applications of Models of Computation*, (**TAMC**), Beijing, China. 2006
- “On PAC Learning Algorithms for Rich Boolean Function Classes” invited to *Theoretical Computer Science* special issue of selected papers from **TAMC** 2006 2006
- “Separating Models of Learning from Correlated and Uncorrelated Data” invited to *Journal of Machine Learning Research* special issue of selected papers from **COLT** 2005 2005
- “Agnostically Learning Halfspaces” invited to *SIAM Journal on Computing* special issue of selected papers from **FOCS** 2005 2005
- “Learning Intersections of Halfspaces with a Margin” invited to *Journal of Computer & System Sciences* special issue of selected papers from **STOC**, **FOCS**, **COLT** and **UAI** 2004 2004
- “Learning Juntas” invited to *Journal of Computer & System Sciences* special issue of selected papers from **STOC** 2003 2003
- “Learning DNF from Random Walks” invited to *Journal of Computer* 2003

- Journal of Computer & System Sciences* special issue of selected papers from **STOC**, **FOCS** and **COLT** 2003
- “Boosting in the Presence of Noise” invited to *Journal of Computer & System Sciences* special issue of selected papers from **STOC**, **FOCS** and **COLT** 2003 2003
 - “Extremal Properties of Polynomial Threshold Functions” invited to *Journal of Computer & System Sciences* special issue of selected papers from **CCC** 2003 2003
 - “Learning Intersections and Thresholds of Halfspaces” invited to *Journal of Computer & System Sciences* special issue of selected papers from **FOCS** 2002 2002
 - “On Learning Embedded Midbit Functions” invited to *Theoretical Computer Science* special issue of selected papers from **ALT** 2002 2002
 - “Learning DNF in Time $2^{\tilde{O}(n^{1/3})}$ ” invited to *Journal of Computer & System Sciences* special issue of selected papers from **STOC** 2001 2001
 - “Boosting and Hard-Core Set Construction” invited to *Machine Learning* special issue on Computational Learning Theory 2000
 - “PAC Analogues of Perceptron and Winnow via Boosting the Margin” invited to *Machine Learning* special issue of selected papers from **COLT** 2000 2000

Columbia University Service:

- Chair of Computer Science Department, 7/2018 – present.
- Provost Leadership Fellow, Columbia University, fall 2017 – present
- Columbia University, Interim Department Chair, Department of Computer Science, July 2015 – December 2015 (during department chair’s sabbatical leave)
- Vice-Chair of Computer Science Department, 7/2012 – 6/2018.
- Member-at-Large, SEAS Executive Committee, 9/2014 – 8/2016.
- Assignment and Scheduling Committee (chair), Computer Science Department, 7/2012 – 6/2016.
- Member of Oversight Council, The School at Columbia, 2008 – 2015.
- Member of Search Committee for Head of School, The School at Columbia, 2011 – 2012.
- Committee member, Foundations of Data Sciences Center, Columbia University Institute for Data Sciences and Engineering, 2013 – present.
 - Editor of Columbia University Computer Science department newsletter. Spring ’05, Fall ’05, Spring ’06, Fall ’06, Spring ’07, Spring ’08, Fall ’08, Spring ’09, Fall ’09, Spring ’10, Spring ’12 issues.
 - Co-organized Columbia/NYU/IBM Research New York Area Theory Day (a 1-day seminar of invited talks on theoretical computer science from distinguished speakers, typically 80–100 attendees) Spring ’04, Fall ’04, Fall ’06, Fall ’08, Spring ’09, Fall ’11, Spring ’12.
 - Organized Columbia Computer Science Theory Seminar 2004–5, 2006–7, 2008–9, Spring 2010.
 - Other Computer Science department committee memberships: MS admissions committee, Visibility committee, Nominations committee, MS committee, Ph.D. committee, Faculty Recruiting committee, Lecturer Recruiting committee.
 - Served as Computer Science Department’s “Foundations” Masters Track advisor and “Machine Learning” Masters Track advisor.

- Served on and chaired various SEAS Ad Hoc Committees to review candidates for promotion.
- Served on Columbia University committee to select Packard Fellowship nominees.
- Served on Data Science Institute committee to select Collaboratory proposal recipients.
- Columbia University Commencement Mace Bearer, 2014.

Professional Service:

Technical Program Committee Chairmanships:

- Program Committee chair, Conference on Computational Complexity (**CCC** 2018) 2018
- Program Committee chair, 16th International Workshop on Randomization and Computation (**RANDOM** 2012) 2012
- Program Committee co-chair, 21st Annual Conference on Learning Theory (**COLT** 2008) 2008
- Program Committee co-chair, Eighteenth International Conference on Algorithmic Learning Theory (**ALT** 2007) 2007

Editorial Service:

- Associate Editor, *SIAM Journal on Computing* 2016 – present
- Associate Editor, *ACM Transactions on Algorithms* 2014 – 2016
- Area co-editor for Computational Learning Theory, *Encyclopedia of Algorithms*, 2nd ed. 2014
- Member of the Scientific Board, ECCC (Electronic Colloquium on Computational Complexity) 2009 – present
- Co-edited *SIAM J. Computing* Special Section on **STOC** 2009 2012
- Inaugural editorial board member, *ACM Transactions on Computation Theory* 2008 – 2018
- Co-editor for *Theoretical Computer Science* special issue of selected **ALT** 2007 papers 2008
- Area editor for Computational Learning Theory, *Encyclopedia of Algorithms* 2008
- Editorial board member, *Algorithmica* 2007-2011
- Editorial board member, *Machine Learning Journal* 2006-2008
- Action editor, *Journal of Machine Learning Research* 2005-2011

Program Committee Memberships:

COLT 2017, **FOCS** 2016, **ITCS** 2016, **ICALP** 2015, **COLT** 2014, **ISAIM** 2014, **STOC** 2013, **ALT** 2012, **CCC** 2012, **FOCS** 2011, **ICS** 2011, **COLT** 2010, **RANDOM** 2010, **STOC** 2009, **CCC** 2008, **SODA** 2008, **TAMC** 2007, **COLT** 2007, **STOC** 2006, **ICML** 2006, **ICML** 2005, **COLT** 2005, **FOCS** 2004, **RANDOM** 2004, **ICML** 2004, **ALT** 2004, **ALT** 2003, **COLT** 2002, **ICML** 2002

Other Professional Service:

- Board member and Awards Chair of the Computational Complexity Foundation, 2016–present
- Committee to select Editor-in-Chief of *ACM Transactions on Computation Theory* (TOCT), 2016
- **STOC** 2015 General Chair, 2015
- DIMACS (Center for Discrete Mathematics and Theoretical Computer Science, Rutgers University) Executive Committee, 2014–2018

- ACM SIGACT Executive Committee Member-at-Large, 2012 – 2015
- Co-organized five-day workshop on “Real Analysis in Testing, Learning and Inapproximability” held at the Simons Institute, UC Berkeley, August 2013.
 - Panelist for Simons Foundation symposium planning meeting (x2), 2012.
 - One of four reviewers of Simons Graduate Fellowship Applications in theoretical computer science, 2012.
 - Co-organized two-day workshop on “Analysis and Geometry of Boolean Threshold Functions” held in Princeton in October 2010.
 - Co-organized daylong workshop in celebration of Leslie Valiant’s 60th birthday, May 2009 (took place the day before STOC and was co-located with STOC).
- Program committee member for Princeton Center for Computational Intractability workshop on “Barriers in Computational Complexity,” 2009.
 - Member, Association for Computational Learning (**COLT** conference steering committee), 2005–2008.
 - Steering Committee Member, Conference on Algorithmic Learning Theory (**ALT**), 2007–2008.
 - Participated in NSF-sponsored workshop on “The Computational Worldview and the Sciences,” 2007.
 - NSF theoretical computer science grant panelist (nine occasions).
 - External grant reviewer for Israel Science Foundation (five occasions).
 - External referee for many journals and conferences in theoretical computer science and machine learning, including *Journal of the ACM*, *SIAM Journal on Computing*, *SIAM Journal on Discrete Mathematics*, *Journal of Computer and System Sciences*, *Journal of Machine Learning Research*, *Computational Complexity*, *Annals of Operations Research*, *Machine Learning Journal*, *Theoretical Computer Science*, *Theory of Computing Systems*, *Journal of Interconnection Networks*, *European Journal of Operational Research*, *Neural Computation*, *Neural Networks*, *Information Processing Letters*, *Symposium on Theory of Computing (STOC)*, *Symposium on Foundations of Computer Science (FOCS)*, *Symposium on Discrete Algorithms (SODA)*, *Conference on Computational Learning Theory (COLT)*, *Conference on Computational Complexity (CCC)*, *Advances in Neural Information Processing Systems (NIPS)*, *International Conference on Machine Learning (ICML)*, *Symposium on Theoretical Aspects of Computer Science (STACS)*, *International Conference on Computational Molecular Biology (RECOMB)*, *International Conference on Algorithmic Learning Theory (ALT)*

Consulting Record:

- Consultant, Microsoft Research Silicon Valley (intermittent) 2009-2015
Performed collaborative research in theoretical computer science: computational learning, computational complexity, derandomization
- Encryption Researcher, Widevine Technologies 2000-2001
Performed theoretical and experimental security analysis of a cryptosystem.
- Consultant, Harvard University Library 1997-1998
Designed and implemented a machine learning based software system to select books with low predicted frequency of future use for storage in an offsite facility.

Professional Registration: None

Patents:

1. “Systems and methods for martingale boosting in machine learning,” with P. Long, R. Anderson and A. Boulanger, patent number 8,036,996, granted October 11, 2011.
2. “Method and apparatus for machine learning using a random projection,” with P. Long, patent number 8,744,981, granted June 3, 2014.
3. “Method and apparatus for machine learning,” with P. Long, patent number 8,972,307, granted March 3, 2015.

Major New Products, Processes, Designs, or Systems: None

Teaching Experience and Evaluations at Columbia:

- Fall 2018: taught COMS 4252 (“Introduction to Computational Learning Theory”) to 89 students. Received instructor rating of 4.54 out of 5.0.
- Spring 2017: taught COMS 6998 (“Advanced Topics in Computational Complexity”) to 17 students. Received instructor rating of 4.80 out of 5.0.
- Fall 2015: taught COMS 4252 (“Introduction to Computational Learning Theory”) to 62 students. Received instructor rating of 4.91 out of 5.0.
- Fall 2014: taught COMS 4252 (“Introduction to Computational Learning Theory”) to 69 students. Received instructor rating of 4.63 out of 5.0.
- Spring 2014: taught COMS 6998 (“Sublinear Time Algorithms in Learning and Property Testing”) to 17 students. Received instructor rating of 4.83 out of 5.0.
- Fall 2013: taught COMS 4252 (“Introduction to Computational Learning Theory”) to 59 students. Received instructor rating of 4.63 out of 5.0.
- Fall 2012: taught COMS 4252 (“Introduction to Computational Learning Theory”) to 61 students. Received instructor rating of 4.29 out of 5.0.
- Spring 2012: taught COMS 6253 (“Advanced Topics in Computational Learning Theory”) to 14 students. Received instructor rating of 4.89 out of 5.0.
- Fall 2011: taught COMS 4252 (“Introduction to Computational Learning Theory”) to 92 students. Received instructor rating of 4.45 out of 5.0.
- Spring 2010: taught COMS 4236 (“Introduction to Computational Complexity”) to 15 students. Received instructor rating of 5.0 out of 5.0.
- Fall 2009: taught COMS 4252 (“Introduction to Computational Learning Theory”) to 32 students. Received instructor rating of 4.62 out of 5.0.
- Spring 2009: taught COMS 6998 (“Advanced Topics in Computational Complexity”) to 13 students. Received instructor rating of 4.78 out of 5.0.
- Fall 2008: taught COMS 4252 (“Introduction to Computational Learning Theory”) to 37 students. Received instructor rating of 4.48 out of 5.0.
- Spring 2008: taught COMS 4236 (“Introduction to Computational Complexity”) to 26 students. Received instructor rating of 4.88 out of 5.0.
- Spring 2007: taught COMS 6253 (“Introduction to Computational Learning Theory”) to 10 students. Received instructor rating of 4.90 out of 5.0.
- Fall 2006: taught COMS 4252 (“Introduction to Computational Learning Theory”) to 33 students. Received instructor rating of 4.45 out of 5.0.
- Spring 2006: taught COMS 4236 (“Introduction to Computational Complexity”) to 26 students. Received instructor rating of 4.06 out of 5.0.
- Fall 2005: taught COMS 4252 (“Introduction to Computational Learning Theory”) to 23 students. Received instructor rating of 4.72 out of 5.0.
- Spring 2005: taught COMS 6998 (“Advanced Topics in Computational Learning Theory”) at Columbia University to 18 students. Received instructor rating of 4.86 out of 5.0.
- Fall 2004: taught COMS 4252 (“Introduction to Computational Learning Theory”) to 24 students. Received an instructor rating of 4.7 out of 5.0.
- Spring 2004: taught COMS 4236 (“Introduction to Computational Complexity”) to 23 students. Received an instructor rating of 4.5 out of 5.0.

- Fall 2003: taught COMS 4995 (“Introduction to Computational Learning Theory”) to 21 students. (x995 courses not rated that term.)
- Spring 2003: taught COMS 4236 (“Introduction to Computational Complexity”) to 23 students. Received instructor rating of 4.7 out of 5.0.
- Spring 2002: taught Applied Mathematics 107 (undergraduate course in Graph Theory and Combinatorics) at Harvard University to 33 students. Received instructor rating of 4.8 out of 5.0.

Publications

Please note that in theoretical computer science the convention is for all authors to be listed alphabetically. In the papers below I have underlined the names of student co-authors.

Journal Papers

- [J1] “Sharp bounds for population recovery,” A. De, R. O’Donnell, R.A. Servedio, *Theory of Computing*, accepted for publication pending revisions. Preliminary version available at <https://arxiv.org/abs/1703.01474>.
- [J2] “Distribution-free junta testing,” Z. Liu, X. Chen, R.A. Servedio, Y. Sheng and J. Xie, *ACM Transactions on Algorithms*, Volume 15, Issue 1, January 2019, Article No. 1. (Preliminary version in **STOC** 2018.)
- [J3] “Settling the query complexity of non-adaptive junta testing,” X. Chen and R.A. Servedio and L.-Y. Tan and E. Waingarten and J. Xie, *Journal of the ACM*, **65**(6), November 2018, Article No. 40. (Preliminary version in **CCC** 2017.)
- [J4] “Optimal Mean-Based Algorithms for Trace Reconstruction,” A. De and R. O’Donnell and R.A. Servedio, *Annals of Applied Probability*, **29**(2), pp. 851-874, 2019. (Preliminary version in **STOC** 2017.)
- [J5] “A new central limit theorem and decomposition for Gaussian polynomials, with an application to deterministic approximate counting,” A. De and R.A. Servedio, *Probability Theory and Related Fields*, **171**(3,4), pp. 981-1044, 2018. (Preliminary version in **STOC** 2014.)
- [J6] “An average-case depth hierarchy theorem for Boolean circuits,” B. Rossman, R.A. Servedio, and L.-Y. Tan, *Journal of the ACM*, **64**(5), Article no. 35, 2017. (Preliminary version in **FOCS** 2015.)
- [J7] “The Inverse Shapley Value Problem,” A. De, I. Diakonikolas, and R.A. Servedio, *Games and Economic Behavior*, **105**(2017) pp. 122-147, 2017. (Preliminary version in **ICALP** 2012.)
- [J8] “A robust Khintchine inequality, and algorithms for computing optimal constants in Fourier analysis and high-dimensional geometry,” A. De, I. Diakonikolas, and R.A. Servedio, *SIAM J. on Discrete Math.*, **30**(2), pp. 1058-1094, 2016. (Preliminary version in **ICALP** 2013.)
- [J9] “Noise stable halfspaces are close to very small juntas,” I. Diakonikolas, R. Jaiswal, R.A. Servedio, L.-Y. Tan, and A. Wan, *Chicago Journal of Theoretical Computer Science*, Article 4, pp. 1–13, 2016.
- [J10] “Testing probability distributions using conditional samples,” C. Canonne, D. Ron, and R.A. Servedio, *SIAM Journal on Computing*, **44**(3), 2015, pp. 540–616. (Preliminary version in **SODA** 2014.)
- [J11] “Learning Poisson Binomial Distributions,” C. Daskalakis, I. Diakonikolas, and R.A. Servedio, *Algorithmica*, published online 11 February 2015, DOI 10.1007/s00453-015-9971-3. (Preliminary version in **STOC** 2012.)
- [J12] “Learning k -modal Distributions via Testing,” C. Daskalakis, I. Diakonikolas, and R.A. Servedio, *Theory of Computing*, **10**(4), 2014, Article 20, pp. 535–570. (Preliminary version in **SODA** 2012.)
- [J13] “On the Weight of Halfspaces over Hamming Balls,” P. Long and R.A. Servedio, *SIAM Journal on Discrete Mathematics*, **28**(3), 2014, pp. 1035–1061. (Preliminary version in **ITCS** 2013.)
- [J14] “Nearly optimal solutions for the Chow Parameters Problem and low-weight approximation of halfspaces,” A. De, I. Diakonikolas, V. Feldman, and R.A. Servedio, *Journal of the ACM*, **61**(2), April 2014, Article 11. (Preliminary version in **STOC** 2012.)

- [J15] “Exponentially improved algorithms and lower bound for testing signed majorities,” D. Ron and R.A. Servedio, *Algorithmica*, **72**(2), 2015, pp. 400–429. DOI 10.1007/s00453-013-9858-0. (Preliminary version in **SODA** 2013.)
- [J16] “Average sensitivity and noise sensitivity of polynomial threshold functions,” I. Diakonikolas, P. Raghavendra, R.A. Servedio and L.-Y. Tan, *SIAM Journal on Computing*, **43**(1), 2014, pp. 231–253. (Preliminary version in **STOC** 2010.)
- [J17] “A Regularity Lemma and Low-Weight Approximators for Low-Degree Polynomial Threshold Functions,” I. Diakonikolas, R.A. Servedio, L.-Y. Tan, and A. Wan, *Theory of Computing*, **10**(2), 2014. (Preliminary version in **CCC** 2010.)
- [J18] “Algorithms and hardness results for parallel large margin learning,” P. Long and R.A. Servedio, *Journal of Machine Learning Research*, **14**, 2013, pp. 3105–3128. (Preliminary version in **NIPS** 2011.)
- [J19] “Improved approximation of linear threshold functions,” I. Diakonikolas and R.A. Servedio, *Computational Complexity*, **22**(3), 2013, pp. 623–677. (Preliminary version in **CCC** 2009.)
- [J20] “Testing Fourier dimensionality and sparsity,” P. Gopalan, R. O’Donnell, R.A. Servedio, A. Shpilka, and K. Wimmer, *SIAM Journal on Computing*, **40**(4), 2011, pp. 1075–1100. (Preliminary version in **ICALP** 2009.)
- [J21] “The Chow Parameters Problem,” R. O’Donnell and R.A. Servedio, *SIAM Journal on Computing*, **40**(1), 2011, pp. 165–199. (Preliminary version in **STOC** 2008.)
- [J22] “Learning random monotone DNF,” J. Jackson, H. Lee, R.A. Servedio, and A. Wan, *Discrete Applied Mathematics*, **159**(5), 2011, pp. 259–271. (Preliminary version in **RANDOM** 2008.)
- [J23] “Efficiently testing sparse $GF(2)$ polynomials,” I. Diakonikolas, H. Lee, K. Matulef, R.A. Servedio, and A. Wan, *Algorithmica*, **61**(3), 2011, pp. 580–605. (Preliminary version in **ICALP** 2009.)
- [J24] “Bounded Independence Fools Halfspaces,” I. Diakonikolas, P. Gopalan, R. Jaiswal, R.A. Servedio, and E. Viola, *SIAM Journal on Computing*, **39**(8), 2010, pp. 3441–3462. (Preliminary version in **FOCS** 2009.)
- [J25] “New Degree Bounds for Polynomial Threshold Functions,” R. O’Donnell and R.A. Servedio, *Combinatorica*, **30**(3), 2010, pp. 327–358. (Preliminary version in **STOC** 2003.)
- [J26] “Testing Halfspaces,” K. Matulef, R. O’Donnell, R. Rubinfeld and R.A. Servedio, *SIAM Journal on Computing*, **39**(5), 2010, pp. 2004–2047. (Preliminary version in **SODA** 2009.)
- [J27] “Random classification noise defeats all convex potential boosters,” P. Long and R.A. Servedio, *Machine Learning Journal*, **78**(3), 2010, pp. 287–304. (Preliminary version in **ICML** 2008.)
- [J28] “Learning Halfspaces with Malicious Noise,” A. Klivans, P. Long and R.A. Servedio, *Journal of Machine Learning Research*, **10**(Dec), 2009, pp. 2715–2740. (Preliminary version in **ICALP** 2009.)
- [J29] “Optimal cryptographic hardness of learning monotone functions,” D. Dachman-Soled, H. Lee, T. Malkin, R.A. Servedio, A. Wan, and H. Wee, *Theory of Computing*, **5**(13), 2009, pp. 257–282. (Preliminary version in **ICALP** 2008.)
- [J30] “Distribution-Free Testing Lower Bounds for Basic Boolean Functions,” D. Glasner and R.A. Servedio, *Theory of Computing*, **5**(10), 2009, pp. 191–216. (Preliminary version in **RANDOM** 2007.)

- [J31] “Testing Monotone High-Dimensional Distributions,” R. Rubinfeld and R.A. Servedio, *Random Structures and Algorithms*, **34**(1), 2009, pp. 24–44. (Preliminary version in **STOC** 2005.)
- [J32] “Learning Unions of $\omega(1)$ -Dimensional Rectangles,” A. Atici and R.A. Servedio, *Theoretical Computer Science*, **405**(3), 2008, pp. 209–222. (Preliminary version in **ALT** 2006.) Special issue for **ALT** 2006.
- [J33] “Agnostically learning halfspaces,” A. Kalai, A. Klivans, Y. Mansour, and R.A. Servedio, *SIAM Journal on Computing*, **37**(6), 2008, pp. 1777–1805. (Preliminary version in **FOCS** 2005.) Special issue for **FOCS** 2005.
- [J34] “Learning Mixtures of Product Distributions over Discrete Domains,” J. Feldman, R. O’Donnell, and R.A. Servedio, *SIAM Journal on Computing*, **37**(5), 2008, pp. 1536–1564. (Preliminary version in **FOCS** 2005.)
- [J35] “Extremal properties of polynomial threshold functions,” R. O’Donnell and R.A. Servedio, *Journal of Computer & System Sciences*, **74**(3), 2008, pp. 298–312. (Preliminary version in **CCC** 2003.) Special issue for **CCC** 2003.
- [J36] “DNF are Teachable in the Average Case,” H. Lee, R.A. Servedio, and A. Wan, *Machine Learning Journal*, **69**, 2007, pp. 79–96. (Preliminary version in **COLT** 2006.) Special issue for **COLT** 2006.
- [J37] “Quantum Algorithms for Testing and Learning Juntas,” A. Atici and R.A. Servedio, *Quantum Information Processing*, **6** (5), 2007, pp. 323–348.
- [J38] “Learning Intersections of Halfspaces with a Margin,” A. Klivans and R.A. Servedio, *Journal of Computer & System Sciences*, **74**(1), 2008, pp. 35–48. (Preliminary version in **COLT** 2004.) Special issue for **COLT** 2004.
- [J39] “On PAC learning algorithms for rich Boolean function classes,” L. Hellerstein and R.A. Servedio, *Theoretical Computer Science*, **384** (1), 2007, pp. 66–76. (Preliminary version in **TAMC** 2006.) Special issue for **TAMC** 2006.
- [J40] “Learning monotone decision trees in polynomial time,” R. O’Donnell and R.A. Servedio, *SIAM Journal on Computing*, **37**(3), 2007, pp. 827–844. (Preliminary version in **CCC** 2006.)
- [J41] “Every linear threshold function has a low-weight approximator,” R.A. Servedio, *Computational Complexity*, **16** (2), 2007, pp. 180–209. (Preliminary version in **CCC** 2006.)
- [J42] “Discriminative Learning can Succeed where Generative Learning Fails,” P. Long, R.A. Servedio, and H. Simon, *Information Processing Letters*, **103** (4), 2007, pp. 131–135,
- [J43] “Separating Models of Learning from Correlated and Uncorrelated Data,” A. Elbaz, H. Lee, R.A. Servedio, and A. Wan, *Journal of Machine Learning Research*, **8**(Feb), 2007, pp. 277–290. (Preliminary version in **COLT** 2005.) Special issue for **COLT** 2005.
- [J44] “LP Decoding Corrects a Constant Fraction of Error,” J. Feldman, T. Malkin, R.A. Servedio, C. Stein, and M. Wainwright, *IEEE Transactions on Information Theory*, **53** (1), 2007, pp. 82–89. (Preliminary version in **ISIT** 2004.)
- [J45] “On Learning Random DNF Formulas under the Uniform Distribution,” J. Jackson and R.A. Servedio, *Theory of Computing*, **2**, 2006, pp. 147–172. (Preliminary version in **RANDOM** 2005.)

- [J46] “Polynomial Certificates for Propositional Classes,” M. Arias, A. Feigelson, R. Khardon, and R.A. Servedio, *Information and Computation*, **204**(5), May 2006, pp. 816–834. (Preliminary version in **COLT** 2003.)
- [J47] “Toward Attribute-Efficient Learning of Decision Lists and Parities,” A. Klivans and R.A. Servedio, *Journal of Machine Learning Research*, **7**(Apr), 2006, pp. 587–602. (Preliminary version in **COLT** 2004.)
- [J48] “On Learning Embedded Midbit Functions,” R.A. Servedio, *Theoretical Computer Science*, **350**(1), 2006, pp. 13-23. (Preliminary version in **ALT** 2002.) Special issue for **ALT** 2002.
- [J49] “Improved Bounds on Quantum Learning Algorithms,” A. Atici and R.A. Servedio, *Quantum Information Processing*, **4**(5), 2005, pp. 355–386.
- [J50] “Learning Random Log-Depth Decision Trees under the Uniform Distribution,” J. Jackson and R.A. Servedio, *SIAM Journal on Computing*, **34**(5), 2005, pp. 1107-1128. (Preliminary version in **COLT** 2003.)
- [J51] “Boosting in the Presence of Noise,” A. Kalai and R.A. Servedio, *Journal of Computer & System Sciences*, **71**(3), 2005, pp. 266-290. (Preliminary version in **STOC** 2003). Special issue for **STOC** 2003, **FOCS** 2003 and **COLT** 2003.
- [J52] “Learning DNF from Random Walks,” N. Bshouty, E. Mossel, R. O’Donnell, and R.A. Servedio, *Journal of Computer & System Sciences*, **71**(3), 2005, pp. 250-265. (Preliminary version in **FOCS** 2003). Special issue for **STOC** 2003, **FOCS** 2003 and **COLT** 2003.
- [J53] “Computing Sparse Permanents Faster,” R.A. Servedio and A. Wan, *Information Processing Letters*, **96**(3), November 2005, pp. 89–92.
- [J54] “Efficiency versus Convergence of Boolean Kernels for Online Learning Algorithms,” R. Khardon, D. Roth, and R.A. Servedio, *Journal of Artificial Intelligence Research*, **24**(Sep), 2005, pp. 341-356. (Preliminary version in **NIPS** 2001).
- [J55] “Maximum Margin Algorithms with Boolean Kernels,” R. Khardon and R.A. Servedio, *Journal of Machine Learning Research*, **6**(Sep), 2005, pp. 1405-1429.
- [J56] “Learning Functions of k Relevant Variables,” E. Mossel, R. O’Donnell, and R.A. Servedio, *Journal of Computer & System Sciences*, **69**(3), 2004, pp. 421-434. (Preliminary version in **STOC** 2003 as “Learning Juntas”). Special issue for **STOC** 2003.
- [J57] “On Learning Monotone DNF under Product Distributions,” R.A. Servedio, *Information and Computation*, **193**(1), 2004, pp. 57–74. (Preliminary version in **COLT** 2001.)
- [J58] “Equivalences and Separations between Quantum and Classical Learnability,” R.A. Servedio and S. Gortler, *SIAM Journal on Computing*, **33**(5), 2004, pp. 1067–1092. (Preliminary version appeared in **CCC** 2001.)
- [J59] “Monotone Boolean Formulas can Approximate Monotone Linear Threshold Functions,” R.A. Servedio, *Discrete Applied Mathematics*, **142**(1-3), 2004, pp. 181–187. Special issue on Boolean and pseudo-Boolean functions.
- [J60] “Learning Intersections and Thresholds of Halfspaces,” A. Klivans, R. O’Donnell, and R.A. Servedio, *Journal of Computer and System Sciences*, **68**(4), 2004, pp. 808–840 (Preliminary version in **FOCS** 2002). Special issue for **FOCS** 2002.

- [J61] “Learning DNF in Time $2^{\tilde{O}(n^{1/3})}$,” A. Klivans and R.A. Servedio, *Journal of Computer and System Sciences* **68**(2), 2004, pp. 303–318. (Preliminary version in **STOC** 2001.) Special issue for **STOC** 2001.
- [J62] “Smooth Boosting and Learning with Malicious Noise,” R.A. Servedio, *Journal of Machine Learning Research*, **4**(Sep), pp. 633–648, 2003. (Preliminary version in **COLT** 2001.)
- [J63] “Boosting and Hard-Core Sets,” A. Klivans and R.A. Servedio, *Machine Learning*, **53**(3), pp. 217–238, 2003. (Preliminary version in **FOCS** 1999.) Special issue on Computational Learning Theory.
- [J64] “Perceptron, Winnow, and PAC Learning,” R.A. Servedio, *SIAM Journal on Computing*, **31**(5), pp. 1358–1369, 2002. (Preliminary version in **COLT** 1999.)
- [J65] “PAC Analogues of Perceptron and Winnow via Boosting the Margin,” R.A. Servedio, *Machine Learning*, **47**(2/3), pp. 133–152, 2002. (Preliminary version in **COLT** 2000.) Special issue on Computational Learning Theory.
- [J66] “On the Limits of Efficient Teachability,” R.A. Servedio, *Information Processing Letters*, **79**(6), pp. 267–272, 2001.
- [J67] “Computational Sample Complexity and Attribute-Efficient Learning,” R.A. Servedio, *Journal of Computer and System Sciences*, **60**(1), pp. 161–178, 2000. (Preliminary version in **STOC** 1999.)
- [J68] “A Bijective Proof on Circular Compositions,” R.A. Servedio and Y.N. Yeh, *Bulletin of the Institute of Mathematics, Academia Sinica*, **23**(4), pp. 283–293, 1995.

Papers in Refereed Conferences

(Many of these papers were subsequently published as journal articles.)

- [C1] “Fooling polytopes,” R. O’Donnell and R.A. Servedio and L.-Y. Tan, *51st ACM Symposium on Theory of Computing (STOC)*, 2019, to appear.
- [C2] “Density estimation for shift-invariant multidimensional distributions,” A. De and P. Long and R.A. Servedio, *10th 9th Innovations in Theoretical Computer Science Conference (ITCS)*, 28:1-28:20, 2019. 66/202 papers (33%) accepted.
- [C3] “Pseudorandomness for read-k DNF formulas,” R.A. Servedio and L.-Y. Tan, *30th ACM-SIAM Symposium on Discrete Algorithms (SODA)*, 621-638, 2019. 180/586 papers (31%) accepted.
- [C4] “Learning Sums of Independent Random Variables with Sparse Collective Support,” A. De and P. Long and R.A. Servedio, *59th IEEE Symposium on Foundations of Computer Science (FOCS)*, 297-308, 2018. 86/320 papers (27%) accepted.
- [C5] “Luby–Veličković–Wigderson revisited: Improved correlation bounds and pseudorandom generators for depth-two circuits,” R.A. Servedio and L.-Y. Tan, *22nd International Conference on Randomization and Computation (RANDOM)*, 56:1-56:20, 2018. 30/73 papers (41%) accepted.
- [C6] “Distribution-Free Junta Testing,” X. Chen and Z. Liu and R.A. Servedio and Y. Sheng and J. Xie, *50th ACM Symposium on Theory of Computing (STOC)*, pp. 749-759, 2018. 111/416 papers (27%) accepted.
- [C7] “Deterministic Search for CNF Satisfying Assignments in Almost Polynomial Time,” R.A. Servedio and L.-Y. Tan, *58th IEEE Symposium on Foundations of Computer Science (FOCS)*, pp. 813-823, 2017. 90/323 papers (28%) accepted.

- [C8] “Fooling Intersections of Low-Weight Halfspaces,” R.A. Servedio and L.-Y. Tan, *58th IEEE Symposium on Foundations of Computer Science (FOCS)*, pp. 824-835, 2017. 90/323 papers (28%) accepted.
- [C9] “Adaptivity is Exponentially Powerful for Testing Monotonicity of Halfspaces,” X. Chen and R.A. Servedio and L.-Y. Tan and E. Waingarten, *21st International Workshop on Randomization and Computation (RANDOM)*, 38:1-38:21, 2017. 27/72 papers (38%) accepted.
- [C10] “Sample-Based High-Dimensional Convexity Testing,” X. Chen and A. Freilich and R.A. Servedio and T. Sun, *21st International Workshop on Randomization and Computation (RANDOM)*, 37:1-37:20, 2017. 27/72 papers (38%) accepted.
- [C11] “Settling the query complexity of non-adaptive junta testing,” X. Chen and R.A. Servedio and L.-Y. Tan and E. Waingarten and J. Xie, *32nd Conference on Computational Complexity (CCC)*, 26:1-26, 2017. **Best Paper award.** 33/98 papers (34%) accepted.
- [C12] “Optimal Mean-Based Algorithms for Trace Reconstruction,” A. De and R. O’Donnell and R.A. Servedio, *49th ACM Symposium on Theory of Computing (STOC)*, pp. 1047-1056, 2017. 103/422 papers (24%) accepted.
- [C13] “Addition is Exponentially Harder than Counting for Shallow Monotone Circuits,” X. Chen and I. Oliveira and R.A. Servedio, *49th ACM Symposium on Theory of Computing (STOC)*, pp. 1232-1245, 2017. 103/422 papers (24%) accepted.
- [C14] “What circuit classes can be learned with non-trivial savings?,” R.A. Servedio and L.-Y. Tan, *8th Innovations in Theoretical Computer Science Conference (ITCS)*, 2017. 61/171 papers (36%) accepted.
- [C15] “Degree and Sensitivity: tails of two distributions,” P. Gopalan, R.A. Servedio, and A. Wigderson, *31st Conference on Computational Complexity (CCC)*, pp. 13.1-13.23, 2016. 34/91 papers (37%) accepted.
- [C16] “Poly-logarithmic Frege depth lower bounds via an expander switching lemma,” T. Pitassi, B. Rossman, R.A. Servedio, and L.-Y. Tan, *48th ACM Symposium on Theory of Computing (STOC)*, pp. 644-657, 2016. 92/370 papers (25%) accepted.
- [C17] “Near-optimal small-depth lower bounds for small distance connectivity” X. Chen, I. Oliveira, R.A. Servedio, and L.-Y. Tan, *48th ACM Symposium on Theory of Computing (STOC)*, pp. 612-625, 2016. 92/370 papers (25%) accepted.
- [C18] “Smooth Boolean functions are easy: efficient algorithms for low-sensitivity functions,” P. Gopalan, N. Nisan, R.A. Servedio, K. Talwar and A. Wigderson, *Innovations in Theoretical Computer Science (ITCS)*, pp. 59-70, 2016. 40/141 papers (28%) accepted.
- [C19] “An average-case depth hierarchy theorem for Boolean circuits,” B. Rossman, R.A. Servedio, and L.-Y. Tan, *56th IEEE Symposium on Foundations of Computer Science (FOCS)*, pp. 1030–1048, 2015. **Best Paper award.** 86/314 papers (27%) accepted.
- [C20] “Learning circuits with few negations,” E. Blais, C. Canonne, I. Oliveira, R.A. Servedio, and L.-Y. Tan, *19th International Workshop on Approximation, Randomization, and Combinatorial Optimization (RANDOM)*, pp. 512–527, 2015. 30/79 papers (38%) accepted.
- [C21] “Boolean function monotonicity testing requires (almost) $n^{1/2}$ non-adaptive queries,” X. Chen, A. De, R.A. Servedio, and L.-Y. Tan, *47th ACM Symposium on Theory of Computing (STOC)*, pp. 519–528, 2015. 93/347 papers (27%) accepted.

- [C22] “Adaptivity helps for testing juntas,” R.A. Servedio, L.-Y. Tan and J. Wright, *30th Conference on Computational Complexity (CCC)*, pp. 264–279, 2015. 30/110 papers (27%) accepted.
- [C23] “Learning from satisfying assignments,” A. De, I. Diakonikolas, and R.A. Servedio, *26th ACM-SIAM Symposium on Discrete Algorithms (SODA)*, pp. 478–497, 2015. (27% of submissions accepted.)
- [C24] “Near-Optimal Density Estimation in Near-Linear Time Using Variable-Width Histograms,” S.-O. Chan, I. Diakonikolas, R.A. Servedio and X. Sun, *28th Annual Conference on Neural Information Processing Systems (NIPS)*, pp. 1844–1852, 2014. (poster presentation). 414/1678 papers (25%) accepted for poster presentation.
- [C25] “New algorithms and lower bounds for monotonicity testing,” X. Chen, R.A. Servedio, and L.-Y. Tan, *55th IEEE Symposium on Foundations of Computer Science (FOCS)*, pp. 286–295, 2014. 68/273 papers (25%) accepted.
- [C26] “On DNF Approximators for Monotone Boolean Functions,” E. Blais, J. Håstad, R.A. Servedio, and L.-Y. Tan, *41st International Colloquium on Automata, Languages and Programming (ICALP)*, pp. 235–246, 2014.
- [C27] “Efficient deterministic approximate counting for low-degree polynomial threshold functions,” A. De and R.A. Servedio, *46th ACM Symposium on Theory of Computing (STOC)*, pp. 832–841, 2014. 91/322 papers (28%) accepted.
- [C28] “Efficient Density Estimation via Polynomial Approximation,” S.O. Chan, I. Diakonikolas, R.A. Servedio, and X. Sun, *46th ACM Symposium on Theory of Computing (STOC)*, pp. 604–613, 2014. 91/322 papers (28%) accepted.
- [C29] “Deterministic Approximate Counting for Juntas of Degree-2 Polynomial Threshold Functions,” A. De, I. Diakonikolas, and R.A. Servedio, *29th Conference on Computational Complexity (CCC)*, pp. 229–240, 2014. 29/94 papers (31%) accepted.
- [C30] “A Polynomial-time Approximation Scheme for Fault-tolerant Distributed Storage,” C. Daskalakis, A. De, I. Diakonikolas, A. Moitra, and R.A. Servedio, *25th ACM-SIAM Symposium on Discrete Algorithms (SODA)*, pp. 628–644, 2014. (28% submissions accepted.)
- [C31] “Testing equivalence between distributions using conditional samples,” C. Canonne, D. Ron, and R.A. Servedio, *25th ACM-SIAM Symposium on Discrete Algorithms (SODA)*, pp. 1174–1192, 2014. (28% submissions accepted.)
- [C32] “Learning Sums of Independent Integer Random Variables,” C. Daskalakis, I. Diakonikolas, R. O’Donnell, R.A. Servedio, and L.-Y. Tan, *54th Symposium on Foundations of Computer Science (FOCS)*, pp. 217–226, 2013.
- [C33] “A robust Khintchine inequality, and algorithms for computing optimal constants in Fourier analysis and high-dimensional geometry,” A. De, I. Diakonikolas, and R.A. Servedio, *40th International Colloquium on Automata, Languages and Programming (ICALP)*, pp. 376–387, 2013.
- [C34] “Consistency versus Realizable H-Consistency for Multiclass Classification,” P. Long and R.A. Servedio, *International Conference on Machine Learning (ICML)*, pp. 801–809, 2013.
- [C35] “Low-weight Halfspaces for Sparse Boolean Vectors,” P. Long and R.A. Servedio, *Innovations in Theoretical Computer Science (ITCS)*, pp. 21–36, 2013.

- [C36] “Learning mixtures of structured distributions over discrete domains,” S. Chan, I. Diakonikolas, R.A. Servedio, and X. Sun, *24th ACM-SIAM Symposium on Discrete Algorithms (SODA)*, pp. 1380-1394, 2013. 135/454 papers (30%) accepted.
- [C37] “Testing k-Modal Distributions: Optimal Algorithms via Reductions,” C. Daskalakis, I. Diakonikolas, R.A. Servedio, G. Valiant, and P. Valiant, *24th ACM-SIAM Symposium on Discrete Algorithms (SODA)*, pp. 1833-1852, 2013. 135/454 papers (30%) accepted.
- [C38] “Exponentially improved algorithms and lower bound for testing signed majorities,” D. Ron and R.A. Servedio, *24th ACM-SIAM Symposium on Discrete Algorithms (SODA)*, pp. 1319-1336, 2013. 135/454 papers (30%) accepted.
- [C39] “Tight Bounds on Proper Equivalence Query Learning of DNF,” L. Hellerstein, D. Kletenik, L. Sellie, and R.A. Servedio, *Twenty-Fifth Annual Conference on Learning Theory (COLT)*, pp. 31.1-31.18, 2012. 42/139 papers (30%) accepted.
- [C40] “Attribute-Efficient Learning and Weight-Degree Tradeoffs for Polynomial Threshold Functions,” R.A. Servedio, L.-Y. Tan and J. Thaler, *Twenty-Fifth Annual Conference on Learning Theory (COLT)*, pp. 14.1-14.19, 2012. 42/139 papers (30%) accepted.
- [C41] “The Inverse Shapley Value Problem,” A. De, I. Diakonikolas, and R.A. Servedio, *39th International Colloquium on Automata, Languages and Programming (ICALP)*, pp. 266-277, 2012.
- [C42] “Learning Poisson Binomial Distributions,” C. Daskalakis, I. Diakonikolas, and R.A. Servedio, *44th Annual Symposium on Theory of Computing (STOC)*, pp. 709–728, 2012. 89/303 papers accepted (29%)
- [C43] “Nearly optimal solutions for the Chow Parameters Problem and low-weight approximation of halfspaces,” A. De, I. Diakonikolas, V. Feldman, and R.A. Servedio, *44th Annual Symposium on Theory of Computing (STOC)*, pp. 729–746, 2012. 89/303 papers accepted (29%)
- [C44] “Learning k -modal Distributions via Testing,” C. Daskalakis, I. Diakonikolas, and R.A. Servedio, *23rd ACM-SIAM Symposium on Discrete Algorithms (SODA)*, pp. 1371–1385, 2012. 138/523 papers accepted (26%)
- [C45] “Private Data Release via Learning Thresholds,” M. Hardt, G. Rothblum, and R.A. Servedio, *23rd ACM-SIAM Symposium on Discrete Algorithms (SODA)*, pp. 168–187, 2012. 138/523 papers accepted (26%)
- [C46] “Algorithms and hardness results for parallel large margin learning,” P. Long and R.A. Servedio, *25th Annual Conference on Neural Information Processing Systems (NIPS)*, 2011 (poster + spotlight oral presentation). 66/1400 papers (5%) accepted for oral presentation.
- [C47] “Learning large-margin halfspaces with more malicious noise,” P. Long and R.A. Servedio, *25th Annual Conference on Neural Information Processing Systems (NIPS)*, 2011 (poster presentation). 305/1400 papers (22%) accepted for poster presentation.
- [C48] “A canonical form for testing Boolean function properties,” D. Dachman-Soled and R.A. Servedio, *15th International Workshop on Randomization and Computation (RANDOM)*, 2011, pp. 460-471. 29/64 papers (45%) accepted.

- [C49] “Lower Bounds and Hardness Amplification for Learning Shallow Monotone Formulas,” V. Feldman, H. Lee, and R.A. Servedio, *Twenty-Fourth Annual Conference on Learning Theory (COLT)*, 2011. 36/117 papers (31%) accepted.
- [C50] “Hardness Results for Agnostically Learning Low-Degree Polynomial Threshold Functions,” I. Diakonikolas, R. O’Donnell, R.A. Servedio, and Y. Wu, *22nd ACM-SIAM Symposium on Discrete Algorithms (SODA)*, 2011, pp. 1590-1606. 136/454 papers (30%) accepted.
- [C51] “Bounding the Average Sensitivity and Noise Sensitivity of Polynomial Threshold Functions,” I. Diakonikolas, P. Harsha, A. Klivans, R. Meka, P. Raghavendra, R.A. Servedio, and L.-Y. Tan, *42nd Annual ACM Symposium on Theory of Computing (STOC)*, pp. 533-542, 2010. 78/279 papers (28%) accepted.
- [C52] “Learning and Lower Bounds for AC^0 with Threshold Gates,” P. Gopalan and R.A. Servedio, *14th Intl. Workshop on Randomization and Computation (RANDOM)*, pp. 588-601, 2010. 29/61 papers (48%) accepted.
- [C53] “A regularity lemma, and low-weight approximators, for low-degree polynomial threshold functions,” I. Diakonikolas, R.A. Servedio, L.-Y. Tan and A. Wan, *25th Conference on Computational Complexity (CCC)*, pp. 211-222, 2010. 25/76 papers (33%) accepted.
- [C54] “Restricted Boltzmann Machines are Hard to Approximately Evaluate or Simulate,” P. Long and R.A. Servedio, *27th International Conference on Machine Learning (ICML)*, pp. 703-710, 2010. 152/594 papers (26%) accepted.
- [C55] “Bounded Independence Fools Halfspaces,” I. Diakonikolas, P. Gopalan, R. Jaiswal, R.A. Servedio, and E. Viola, *50th Annual Symposium on Foundations of Computer Science (FOCS)*, 2009, pp. 171–180. 75/249 papers (30%) accepted.
- [C56] “Testing ± 1 -Weight Halfspaces,” K. Matulef, R. O’Donnell, R. Rubinfeld, and R.A. Servedio, *13th International Workshop on Randomization and Computation, (RANDOM)*, 2009, pp. 646–657. 28/57 papers (49%) accepted.
- [C57] “Testing Fourier dimensionality and sparsity,” P. Gopalan, R. O’Donnell, R.A. Servedio, A. Shpilka, and K. Wimmer, *36th International Colloquium on Automata, Languages and Programming (ICALP)*, 2009, pp. 500-512. 62/223 papers (28%) accepted.
- [C58] “Learning halfspaces with malicious noise,” A. Klivans, P. Long, and R.A. Servedio, *36th International Colloquium on Automata, Languages and Programming (ICALP)*, 2009, pp. 609-621. 62/223 papers (28%) accepted.
- [C59] “Improved approximation of linear threshold functions,” I. Diakonikolas and R.A. Servedio, *Proceedings of the 24th Annual Conference on Computational Complexity (CCC)*, 2009, pp. 161-172. 37/113 papers (33%) accepted.
- [C60] “Testing Halfspaces,” K. Matulef, R. O’Donnell, R. Rubinfeld, and R.A. Servedio, *20th ACM-SIAM Symposium on Discrete Algorithms (SODA)*, 2009, pp. 256-264. 135/458 papers (29%) accepted.
- [C61] “Adaptive martingale boosting,” P. Long and R.A. Servedio, *21st Annual Conference on Neural Information Processing Systems (NIPS)*, 2008, pp. 977-984 (poster + spotlight oral presentation). 250/1022 papers (25%) accepted, 123/1022 (12%) accepted for oral presentation.

- [C62] “Learning Geometric Concepts via Gaussian Surface Area,” A. Klivans, R. O’Donnell, and R.A. Servedio, *49th Annual Symposium on Foundations of Computer Science (FOCS)*, 2008, pp. 541–550. 79/276 papers (29%) accepted.
- [C63] “Learning random monotone DNF,” J. Jackson, H. Lee, R.A. Servedio, and A. Wan, *Proceedings of the 12th International Workshop on Randomness and Computation (RANDOM)*, 2008, pp. 483–497. 27/50 papers (54%) accepted.
- [C64] “Efficiently testing sparse $GF(2)$ polynomials,” I. Diakonikolas, H. Lee, K. Matulef, R.A. Servedio, and A. Wan, *35th International Colloquium on Automata, Languages and Programming (ICALP)*, 2008, pp. 502–514. 70/269 papers (26%) accepted.
- [C65] “Optimal cryptographic hardness of learning monotone functions,” D. Dachman-Soled, H. Lee, T. Malkin, R.A. Servedio, A. Wan, and H. Wee, *35th International Colloquium on Automata, Languages and Programming (ICALP)*, 2008, pp. 36–47. 70/269 papers (26%) accepted.
- [C66] “Random classification noise defeats all convex potential boosters,” P. Long and R.A. Servedio, *25th International Conference on Machine Learning (ICML)*, 2008, pp. 608–615. 155/583 papers (27%) accepted.
- [C67] “The Chow Parameters Problem,” R. O’Donnell and R.A. Servedio, *40th Annual ACM Symposium on Theory of Computing (STOC)*, 2008, pp. 517–526. 80/325 papers (25%) accepted.
- [C68] “One-Pass Boosting,” Z. Barutcuoglu, P. Long, and R.A. Servedio, *21st Annual Conference on Neural Information Processing Systems (NIPS)*, 2007 (poster + spotlight oral presentation). 217/975 papers (22%) accepted, 101/975 (10%) accepted for oral presentation.
- [C69] “Boosting the Area under the ROC Curve,” P. Long and R.A. Servedio, *21st Annual Conference on Neural Information Processing Systems (NIPS)*, 2007 (poster + spotlight oral presentation). 217/975 papers (22%) accepted, 101/975 (10%) accepted for oral presentation.
- [C70] “Testing for Concise Representations,” I. Diakonikolas, H. Lee, K. Matulef, K. Onak, R. Rubinfeld, R.A. Servedio, and A. Wan, *48th Annual Symposium on Foundations of Computer Science (FOCS)*, 2007, pp. 549–558. 66/304 papers (22%) accepted.
- [C71] “Distribution-Free Testing Lower Bounds for Basic Boolean Functions,” D. Glasner and R.A. Servedio, *Proceedings of the 11th International Workshop on Randomness and Computation (RANDOM)*, 2007, pp. 494–508. 23/50 papers (46%) accepted.
- [C72] “Highly Efficient Secrecy-Preserving Proofs of Correctness of Computations and Applications,” M. Rabin, R.A. Servedio, and C. Thorpe, *22nd IEEE Symposium on Logic in Computer Science (LICS)*, 2007, pp. 63–76. (Paper accompanied an invited talk by M. Rabin.)
- [C73] “Attribute-efficient learning of decision lists and linear threshold functions under unconcentrated distributions,” P. Long and R.A. Servedio, *20th Annual Conference on Neural Information Processing Systems (NIPS)*, 2006 (poster presentation). 204/833 papers (24%) accepted.
- [C74] “Learning Unions of $\omega(1)$ -Dimensional Rectangles,” A. Atici and R.A. Servedio, *Proceedings of the Seventeenth International Conference on Algorithmic Learning Theory (ALT)*, 2006, pp. 32–47. **Best Student Paper award.**

- [C75] “Every linear threshold function has a low-weight approximator,” R.A. Servedio, *Proceedings of the 21st Annual Conference on Computational Complexity (CCC)*, 2006, pp. 18–32. 29/85 papers (34%) accepted.
- [C76] “Learning monotone decision trees in polynomial time,” R. O’Donnell and R.A. Servedio, *Proceedings of the 21st Annual Conference on Computational Complexity (CCC)*, 2006, pp. 213–225. 29/85 papers (34%) accepted.
- [C77] “PAC Learning Mixtures of Axis-Aligned Gaussians with No Separation Assumption,” J. Feldman, R. O’Donnell, and R.A. Servedio, *Proceedings of the 19th Annual Conference on Learning Theory (COLT)*, 2006, pp. 20–34. 43/102 papers (42%) accepted.
- [C78] “DNF are Efficiently Teachable in the Average Case,” H. Lee, R.A. Servedio, and A. Wan. *Proceedings of the 19th Annual Conference on Learning Theory (COLT)*, 2006, pp. 214–228. 43/102 papers (42%) accepted. **Mark Fulk Award for Best Student Paper.**
- [C79] “On PAC learning algorithms for rich Boolean function classes,” R.A. Servedio, *Proceedings of the 3rd Annual Conference on Theory and Applications of Models of Computation (TAMC)*, 2006, pp. 442–451. (This paper accompanies an invited talk.)
- [C80] “Agnostically learning halfspaces,” A. Kalai, A. Klivans, Y. Mansour, and R.A. Servedio, *Proceedings of the 46th IEEE Symposium on Foundations of Computer Science (FOCS)*, 2005, pp. 11–20. 65/253 papers (25%) accepted.
- [C81] “Every decision tree has an influential variable,” R. O’Donnell, M. Saks, O. Schramm, and R.A. Servedio, *Proceedings of the 46th IEEE Symposium on Foundations of Computer Science (FOCS)*, 2005, pp. 31–39. 65/253 papers (25%) accepted.
- [C82] “Learning Mixtures of Product Distributions over Discrete Domains,” J. Feldman, R. O’Donnell, and R.A. Servedio, *Proceedings of the 46th IEEE Symposium on Foundations of Computer Science (FOCS)*, 2005, pp. 501–510. 65/253 papers (25%) accepted.
- [C83] “On Learning Random DNF Formulas under the Uniform Distribution,” J. Jackson and R.A. Servedio, *Proceedings of the 9th International Workshop on Randomness and Computation (RANDOM)*, 2005, pp. 342–353. 21/51 papers (41%) accepted.
- [C84] “Unsupervised Evidence Integration,” P. Long, M. Treshock, S. Gilman, R.A. Servedio, and V. Varadan, *Proceedings of the 22nd International Conference on Machine Learning (ICML)*, 2005, pp. 521–528. 134/492 papers (27%) accepted.
- [C85] “Martingale Boosting,” P. Long and R.A. Servedio, *Proceedings of the 18th Annual Conference on Learning Theory (COLT)*, 2005, pp. 79–94. 45/120 papers (37%) accepted.
- [C86] “Separating Models of Learning from Correlated and Uncorrelated Data,” A. Elbaz, H. Lee, R.A. Servedio, and A. Wan, *Proceedings of the 18th Annual Conference on Learning Theory (COLT)*, 2005, pp. 637–651. 45/120 papers (37%) accepted.
- [C87] “Testing Monotone High-Dimensional Distributions,” R. Rubinfeld and R.A. Servedio, *Proceedings of the 37th ACM Symposium on Theory of Computing (STOC)*, 2005, pp. 147–156. 84/289 papers (29%) accepted.

- [C88] “On the Capacity of Secure Network Coding,” J. Feldman, T. Malkin, R.A. Servedio, and C. Stein, in *Proceedings of the Forty-Second Annual Allerton Conference on Communication, Control, and Computing (ALLERTON)*, 2004.
- [C89] “Toward Attribute-Efficient Learning of Decision Lists and Parities,” A. Klivans and R.A. Servedio, *Proceedings of the 17th Annual Conference on Learning Theory (COLT)*, 2004, pp. 234–248. 43/107 papers (40%) accepted.
- [C90] “Learning Intersections of Halfspaces with a Margin,” A. Klivans and R.A. Servedio, *Proceedings of the 17th Annual Conference on Learning Theory (COLT)*, 2004, pp. 348–362. 43/107 papers (40%) accepted.
- [C91] “Perceptron-Like Performance for Intersections of Halfspaces (open problem),” A. Klivans and R.A. Servedio, *Proceedings of the 17th Annual Conference on Learning Theory (COLT)*, 2004, pp. 639–640. 3/6 open problems (50%) accepted.
- [C92] “LP Decoding Corrects a Constant Fraction of Error,” J. Feldman, T. Malkin, R.A. Servedio, C. Stein, and M. Wainwright, in *Proceedings of the IEEE International Symposium on Information Theory (ISIT)*, 2004. 570/958 papers (59%) accepted.
- [C93] “Learning DNF from Random Walks,” N. Bshouty, E. Mossel, R. O’Donnell, and R.A. Servedio, *Proceedings of the 44th IEEE Symposium on Foundations of Computer Science (FOCS)*, 2003, pp. 189–198. 63/254 papers (24%) accepted.
- [C94] “Learning Random Log-Depth Decision Trees under the Uniform Distribution,” J. Jackson and R.A. Servedio, *Proceedings of the Sixteenth Annual Conference on Computational Learning Theory (COLT)*, 2003, pp. 610–624. 49/92 papers (53%) accepted.
- [C95] “Maximum Margin Algorithms with Boolean Kernels,” R. Khandon and R.A. Servedio, *Proceedings of the Sixteenth Annual Conference on Computational Learning Theory (COLT)*, 2003, pp. 87–101. 49/92 papers (53%) accepted.
- [C96] “Polynomial Certificates for Propositional Classes,” [M. Arias](#), R. Khandon, and R.A. Servedio, *Proceedings of the Sixteenth Annual Conference on Computational Learning Theory (COLT)*, 2003, pp. 537–551. 49/92 papers (53%) accepted.
- [C97] “Learning Juntas,” E. Mossel, R. O’Donnell, and R.A. Servedio, *Proceedings of the 35th ACM Symposium on Theory of Computing (STOC)*, 2003, pp. 206–212. 80/270 papers (29%) accepted.
- [C98] “New Degree Bounds for Polynomial Threshold Functions,” R. O’Donnell and R.A. Servedio, *Proceedings of the 35th ACM Symposium on Theory of Computing (STOC)*, 2003, pp. 325–334. 80/270 papers (29%) accepted.
- [C99] “Boosting in the Presence of Noise,” A. Kalai and R.A. Servedio, *Proceedings of the 35th ACM Symposium on Theory of Computing (STOC)*, 2003, pp. 196–205. 80/270 papers (29%) accepted.
- [C100] “Extremal properties of polynomial threshold functions,” R. O’Donnell and R.A. Servedio, *Proceedings of the Eighteenth Annual Conference on Computational Complexity (CCC)*, pp. 3-12, 2003. **Best Paper award.**
- [C101] “Learning Intersections and Thresholds of Halfspaces,” A. Klivans, R. O’Donnell, and R.A. Servedio, *Proceedings of the 43rd IEEE Symposium on Foundations of Computer Science (FOCS)*, pp. 177-186, 2002. 77/279 papers (28%) accepted.

- [C102] “On Learning Embedded Midbit Functions,” R.A. Servedio, *Proceedings of the Thirteenth International Conference on Algorithmic Learning Theory (ALT)*, pp. 69-82, 2002. 26/49 papers (53%) accepted.
- [C103] “Learnability Beyond AC^0 ,” J. Jackson, A. Klivans, and R.A. Servedio, *Proceedings of the 34th ACM Symposium on Theory of Computing (STOC)*, 2002. One-page abstract also appeared in *Proceedings of the Seventeenth Annual Conference on Computational Complexity (CCC)*, 2002. 91/287 papers (32%) accepted.
- [C104] “Learning DNF in Time $2^{\tilde{O}(n^{1/3})}$,” A. Klivans and R.A. Servedio, *Proceedings of the 33rd ACM Symposium on Theory of Computing (STOC)*, pp. 258-265, 2001. **Best Student Paper award**. 83/230 papers (36%) accepted.
- [C105] “Efficiency versus Convergence of Boolean Kernels for Online Learning Algorithms,” R. Khardon, D. Roth, and R.A. Servedio, *Advances in Neural Information Processing Systems (NIPS)*, 2001, pp. 423–430. 196/660 papers (30%) accepted.
- [C106] “Quantum versus Classical Learnability,” R.A. Servedio and S. Gortler, *Proceedings of the Sixteenth IEEE Conference on Computational Complexity (CCC)*, pp. 138-148, 2001. 30/60 papers (50%) accepted.
- [C107] “Separating Quantum and Classical Learning,” R.A. Servedio, *Proceedings of the 28th EATCS International Conference on Automata, Languages and Programming (ICALP)*, pp. 1065-1080, 2001. 80/208 papers (38%) accepted.
- [C108] “Smooth Boosting and Linear Threshold Learning with Malicious Noise,” R.A. Servedio, *Proceedings of the Fourteenth ACM Conference on Computational Learning Theory (COLT)*, pp. 473-489, 2001. 40/69 papers (58%) accepted.
- [C109] “On Learning Monotone DNF under Product Distributions,” R.A. Servedio, *Proceedings of the Fourteenth ACM Conference on Computational Learning Theory (COLT)*, pp. 558-573, 2001. 40/69 papers (58%) accepted.
- [C110] “PAC Analogues of Perceptron and Winnow via Boosting the Margin,” R.A. Servedio, *Proceedings of the Thirteenth ACM Conference on Computational Learning Theory (COLT)*, pp. 148-157, 2000. **Mark Fulk Award for Best Student Paper**. 35/64 papers (54%) accepted.
- [C111] “Boosting and Hard-Core Sets,” A. Klivans and R.A. Servedio, *Proceedings of the 40th IEEE Symposium on Foundations of Computer Science (FOCS)*, pp. 624-633, 1999. 67/218 papers (31%) accepted.
- [C112] “On PAC Learning using Perceptron, Winnow and a Perceptron-Like Algorithm,” R.A. Servedio, *Proceedings of the 12th ACM Conference on Computational Learning Theory (COLT)*, pp. 296-307, 1999. 35/71 papers (49%) accepted.
- [C113] “Computational Sample Complexity and Attribute-Efficient Learning,” R.A. Servedio, *Proceedings of the 31st ACM Symposium on Theory of Computing (STOC)*, pp. 701-710, 1999. 86/162 papers (53%) accepted.

Miscellaneous Other Publications

- [M1] “Sharp bounds for population recovery,” A. De and R. O’Donnell and R.A. Servedio, ArXiv Technical Report arXiv:1703.01474, 2017.

- [M2] “The Polynomial Hierarchy, Random Oracles, and Boolean Circuits,” B. Rossman, R.A. Servedio and L.-Y. Tan, Complexity Theory Column 89, *SIGACT News*, **46**(4), December 2015, pp. 50–68.
- [M3] “On a special case of rigidity,” R.A. Servedio and E. Viola, ECCC Technical Report (ECCC 144), 2013.
- [M4] “A High-Dimensional Surprise,” R.A. Servedio, Technical Perspective, *CACM* **55**(10), p. 89, October 2012.
- [M5] “Testing by Implicit Learning: A Brief Survey,” R.A. Servedio, in O. Goldreich (Ed.), *Property Testing*, LNCS 6390, pp. 197–210, Springer, Heidelberg, 2010.
- [M6] “Testing (Subclasses of) Halfspaces,” K. Matulef, R. O’Donnell, R. Rubinfeld, and R.A. Servedio, in O. Goldreich (Ed.), *Property Testing*, LNCS 6390, pp. 334–340, Springer, Heidelberg, 2010.
- [M7] “Learning Constant-Depth Circuits,” R.A. Servedio, in “Encyclopedia of Algorithms,” Springer, pp. 455–457, 2008.
- [M8] “Editor’s Introduction,” M. Hutter and R.A. Servedio, *Proceedings of the Eighteenth International Conference on Algorithmic Learning Theory (ALT)*, 2007, pp. 1–9.

Selected Invited Lectures:

- *Fooling polytopes* 2019
Simons Algorithms and Geometry Collaboration Monthly Meeting
New York, New York
- *Fooling polytopes* 2018
Workshop on Analytic Techniques in Theoretical Computer Science
CMO, Oaxaca, Mexico
- *Fooling polytopes* 2018
Northwestern University Theory Seminar
Evanston, Illinois
- *Learning sums of independent commonly supported integer random variables* 2018
Google Research Seminar
New York, NY
- *Fooling intersections of low-weight halfspaces* 2017
University of Chicago Theory of Computing Seminar
Chicago, IL
- *Fooling intersections of low-weight halfspaces* 2017
Theoretical Computer Science / Discrete Math Seminar
Institute for Advanced Study, Princeton, NJ
- *Learning sums of independent commonly supported integer random variables* 2017
Harvard University Theory of Computing Seminar
Cambridge, MA
- *Learning sums of independent commonly supported integer random variables* 2017
University of Chicago Theory of Computing Seminar
Chicago, IL
- *Pseudorandom generators from pseudorandom multi-switching lemmas* 2017
Simons Institute Workshop on Proving and Using Pseudorandomness
Berkeley, CA
- *Learning sums of independent commonly supported integer random variables* 2016
Duke Machine Learning Seminar
Durham, NC
- *Learning sums of independent commonly supported integer random variables* 2016
New York University Machine Learning Seminar
New York, NY
- *Learning sums of independent commonly supported integer random variables* 2016
New York Colloquium on Algorithms and Complexity
New York, NY
- *Predicting from noisy and incomplete data: some perspectives from computational learning theory* 2016
Simons Institute Workshop on Real-Time Decision Making
Berkeley, CA
- *Two circuit lower bounds* 2016
Low-Depth Complexity Workshop
St. Petersburg, Russia
- *Addition is exponentially harder than counting for shallow monotone circuits* 2016
Simons Workshop on Analysis of Boolean Functions
Schloss Elmau, Germany
- *Circuit lower bounds via random projections* 2016
Rutgers-DIMACS Theoretical Computer Science Seminar
Piscataway, NJ
- *Two circuit lower bounds* 2016

- MIT Theory of Computing Seminar
Cambridge, MA
- *Circuit lower bounds via random projections* 2016
Invited talk, Georgia Tech ARC Theory Day
Atlanta, Georgia
 - *Testing Probability Distributions Using Conditional Samples* 2015
Simons Institute Workshop on Information Theory, Learning and Big Data, UC Berkeley
Berkeley, CA
 - *Learning from Satisfying Assignments* 2015
Microsoft Research India Theory Day
Bengaluru, India
 - *A Probably Approximately Correct Lower Bound for Boolean Function Monotonicity Testing* 2014
University of Pennsylvania Computer Science Theory Seminar
Philadelphia, PA
 - *A Probably Approximately Correct Lower Bound for Boolean Function Monotonicity Testing* 2014
Simons Institute Reunion Workshop on Real Analysis in Computer Science, UC Berkeley
Berkeley, CA
 - *A Probably Approximately Correct Lower Bound for Boolean Function Monotonicity Testing* 2014
New York Colloquium on Algorithms and Complexity
New York, NY
 - *A Complexity-Theoretic View on Unsupervised Learning* 2014
Keynote Lecture, 20th International Computing and Combinatorics Conference (COCOON'14)
Atlanta, GA
 - *A Complexity-Theoretic View on Unsupervised Learning* 2014
Microsoft Research Silicon Valley Theory Seminar
Mountain View, CA
 - *A Complexity-Theoretic View on Unsupervised Learning* 2014
STOC 2014 Workshop on Efficient Density Estimation
New York, NY
 - *A Polynomial Lower Bound for Monotonicity Testing of Boolean Functions* 2014
Theoretical Computer Science / Discrete Math Seminar
Institute for Advanced Study, Princeton, NJ
 - *Learning from Satisfying Assignments* 2013
Brown University Computer Science Theory Seminar,
Providence, RI
 - *Deterministic Approximate Counting for Degree-2 Polynomial Threshold Functions* 2013
Simons Institute Workshop on Real Analysis in Testing, Learning and Inapproximability
Berkeley, California
 - *Learning from Satisfying Assignments* 2013
Rutgers/DIMACS Theoretical Computer Science Seminar
New Brunswick, NJ
 - *Deterministic Approximate Counting for Degree-2 Polynomial Threshold Functions* 2013
Banff International Research Station (BIRS) Workshop on Computational Complexity
Banff, Canada
 - *A Complexity-Theoretic View on Unsupervised Learning* 2013
ELC (Exploring the Limits of Computation) Tokyo Complexity Workshop Kick-Off Event
Tokyo, Japan
 - *Inverse Problems for Power Indices in Weighted Voting Games* 2012
Microsoft Research Silicon Valley Theory Seminar
Mountain View, CA

- *Nearly Optimal Solutions for the Chow Parameters Problem* 2012
Simons Foundation Symposium on Analysis of Boolean Functions
St. John, U.S. Virgin Islands
- *Learning and Testing k -Modal Distributions* 2011
University of Pennsylvania Computer Science Theory Seminar
Philadelphia, PA
- *Learning and Testing k -Modal Distributions* 2011
Microsoft Research Silicon Valley Theory Seminar
Mountain View, CA
- *Learning and Testing k -Modal Distributions* 2011
Bertinoro Workshop on Sublinear Algorithms
Bertinoro, Italy
- *Influences and Boolean Function Representations* 2011
Workshop on Discrete Harmonic Analysis, Isaac Newton Institute for Mathematical Sciences
Cambridge, UK
- *Learning and Testing k -Modal Distributions* 2011
Theoretical Computer Science / Discrete Math Seminar
Institute for Advanced Study, Princeton, NJ
- *Learning and Testing k -Modal Distributions* 2011
Rutgers/DIMACS Theoretical Computer Science Seminar
New Brunswick, NJ
- *A Regularity Lemma for Linear Threshold Functions* 2010
Workshop on Analysis and Geometry of Boolean Threshold Functions
Princeton University Princeton, NJ
- *Boolean Threshold Functions: the Untold Story* 2010
Center for Computational Intractability Seminar
Princeton University, Princeton, NJ
- *Average Sensitivity of Polynomial Threshold Functions* 2010
Theoretical Computer Science / Discrete Math Seminar
Institute for Advanced Study, Princeton, NJ
- *Testing by Implicit Learning* 2010
Tsinghua University Institute for Theoretical Computer Science Workshop on Property Testing
Beijing, China
- *Learning Halfspaces with Malicious Noise* 2010
University of Rochester Computer Science Colloquium
Rochester, NY
- *Learning Halfspaces with Malicious Noise* 2009
Dartmouth Computer Science Colloquium
Hanover, NH
- *Learning Halfspaces with Malicious Noise* 2009
U. Mass. Machine Learning and Friends talk
Amherst, MA
- *Average Sensitivity of Polynomial Threshold Functions* 2009
MIT Theory of Computation Colloquium
Cambridge, MA
- *Learning Halfspaces with Malicious Noise* 2009
Microsoft Research Silicon Valley Theory Seminar
Mountain View, CA
- *A Quarter-Century of Efficient Learnability* 2009
Pre-STOC Workshop to celebrate Leslie Valiant's 60th Birthday

- Bethesda, MD
- *Learning, Testing, and Approximating Halfspaces* 2009
DIMACS Workshop on Boolean and Pseudo-Boolean Functions
New Brunswick, NJ
 - *Testing Fourier Sparsity and Dimensionality* 2008
Banff International Research Station (BIRS) Workshop on Computational Complexity
Banff, Canada
 - *The Chow Parameters Problem* 2008
University of Toronto Computer Science Theory Seminar
Toronto, Canada
 - *The Chow Parameters Problem* 2008
Cornell Workshop on Discrete Harmonic Analysis & its Applications
Ithaca, NY
 - *Learning, Testing, and Approximating Halfspaces* 2008
New York University CS Theory Seminar
New York, NY
 - *Learning, Testing, and Approximation* 2008
Google Technical Talk
New York, NY
 - *Learning, Testing, and Approximation* 2007
Penn State Computer Science Colloquium
State College, PA
 - *Learning, Testing, and Approximating Halfspaces* 2007
Dagstuhl Seminar on Algebraic Methods in Computational Complexity
Wadern, Germany
 - *Learning, Testing, and Approximation* 2007
Invited talk at 11th Internat. Workshop on Randomization and Computation (**RANDOM**)
Princeton, NJ
 - *Every Linear Threshold Function has a Low-Weight Approximator* 2007
Rutgers/DIMACS Theoretical Computer Science Seminar
New Brunswick, NJ
 - *Every Linear Threshold Function has a Low-Weight Approximator* 2007
Carnegie Mellon University Aladdin/Theory/OR Seminar,
Pittsburgh, PA
 - *Learning Monotone Decision Trees in Polynomial Time* 2006
IBM T.J. Watson Research Center, Data Mining seminar
Hawthorne, NY
 - *On PAC Learning Algorithms for Rich Boolean Function Classes* 2006
Special Session on Learning Theory,
3rd Conference on Theory & Applications of Models of Computation (**TAMC**)
Beijing, China
 - *Learning Monotone Functions from Random Examples in Polynomial Time* 2006
UT Austin Algorithms and Computational Theory Seminar
Austin, Texas
 - *Quantum Versus Classical Learning* 2006
Iona College Computer Science Seminar
New Rochelle, New York
 - *Learning Monotone Functions from Random Examples in Polynomial Time* 2005
Yale Theoretical Computer Science Seminar
New Haven, Connecticut

- *Learning Monotone Functions from Random Examples in Polynomial Time* 2005
MIT Theoretical Computer Science Colloquium
Cambridge, Massachusetts
- *Testing Monotone High-Dimensional Distributions* 2005
Dagstuhl Seminar on Sublinear Algorithms
Wadern, Germany
- *Learning Monotone Functions from Random Examples in Polynomial Time* 2005
Third Workshop on Random Graphs & Algorithms (**RGRAALS**)
Bertinoro, Italy
- *Learning Decision Trees and DNF Formulas in the Average Case* 2005
Rutgers/DIMACS Theoretical Computer Science Seminar
New Brunswick, NJ
- *On Learning Random Decision Trees and DNF Formulas* 2004
Theoretical Computer Science / Discrete Math Seminar
Institute for Advanced Study, Princeton, NJ
- *On Learning Random Decision Trees and DNF Formulas* 2004
Toyota Technological Institute at University of Chicago
Chicago, Illinois
- *On Learning Random Decision Trees and DNF Formulas* 2003
IBM T.J. Watson Research Center
Hawthorne, New York
- *Learning Juntas* 2003
Theoretical Computer Science / Discrete Math Seminar
Institute for Advanced Study, Princeton, NJ
- *Learning Juntas* 2003
Polytechnic University Theory of Computation Seminar
Brooklyn, NY
- *Frontiers of Efficient Learnability* 2002
Columbia University Computer Science Colloquium
New York, NY
- *Frontiers of Efficient Learnability* 2002
Brown University Computer Science Colloquium
New York, NY
- *Learning DNF in Time $2^{\tilde{O}(n^{1/3})}$* 2001
MIT Theoretical Computer Science Colloquium
Cambridge, MA
- *Quantum Versus Classical Learnability* 2001
MIT Quantum Information Processing Seminar
Cambridge, MA
- *Quantum Versus Classical Learnability* 2001
CMU Theory of Computation Seminar
Pittsburgh, PA
- *Linear Methods in Machine Learning Theory: New Insights from an Old Paradigm* 2001
UIUC Computer Science Colloquium
Urbana, IL
- *Learning DNF in Time $2^{\tilde{O}(n^{1/3})}$* 2000
NEC Research Institute
Princeton, NJ

Also many paper presentations at conferences including **STOC**, **FOCS**, **SODA**, **COLT**, **CCC**, **NIPS**, **ICALP**, **ITCS**, **ALT**, **RANDOM**

Theses Supervised:

	<u>Total</u>	<u>Completed</u>	<u>In Progress</u>
S.B. S.M.			
As Reader	1	1	
<u>Doctoral</u>	<u>Total</u>	<u>Completed</u>	<u>In Progress</u>
As Supervisor:	12	6	6
As Reader:	26	26	0

Doctoral Theses, Supervisor

1. Alp Atici, (Ph.D. in mathematics), *Advances in Quantum Computational Learning Theory*, 2006.
2. Homin Lee, *On the Learnability of Monotone Functions*, 2009 (co-supervised with Tal Malkin).
3. Andrew Wan, *Learning, Cryptography, and the Average Case*, 2010 (co-supervised with Tal Malkin).
4. Li-Yang Tan, *Analytic Methods in Concrete Complexity*, 2014.
5. Igor Carboni Oliveira, *Unconditional Lower Bounds in Complexity Theory*, 2015 (co-supervised with Tal Malkin).
6. Clement Canonne, 2017 *Property Testing and Probability Distributions: New Techniques, New Models, and New Goals*, 2017.
7. Tim Sun, 2019 (anticipated); co-supervised with Xi Chen.
8. Erik Waingarten, 2020 (anticipated); co-supervised with Xi Chen.
9. Emmanouil Vasileios Vlatakis Gkaragkounis, 2021 (anticipated); co-supervised with Mihalis Yannakakis.
10. Sandip Sinha, 2021 (anticipated); co-supervised with Alexandr Andoni, Cliff Stein.
11. Timothy Randolph, 2023 (anticipated); co-supervised with Xi Chen.
12. Gleb Posobin, 2023 (anticipated); co-supervised with Omri Weinstein.

Doctoral Theses, As Reader (On Thesis Committee)

Darrin Lewis, 2006; Rui Kuang, 2006; David Phillips, 2006; Eyjolfur Asgeirsson, 2007; Fei Li, 2008; Imre Risi Kondor, 2008; Andrew Howard, 2009; Ariel Elbaz, 2009; Karl Wimmer, 2009 (Carnegie Mellon University); Seung Geol Choi, 2009; Spyrodon Antonakopoulos, 2009; Ilias Diakonikolas, 2010; Pannagata Shivaswamy, 2010; Raphael Pelosof, 2011; Blake Shaw, 2011; Dana Dachman-Soled, 2011; Imran Khan, 2011; Moritz Hardt, 2011 (Princeton University); Mariana Raykova, 2012; Snehit Prabhu, 2013; Dimitris Paparas, 2016 ; Dongqu Chen, 2016 (Yale University); Xiaorui Sun, 2016, Sasha Golovnev, 2017 (New York University), Jinyu Xie, 2018, Luke Kowalczyk, 2018.

Current Research Group:

- Emmanouil Vasileios Vlatakis Gkaragkounis; Ph.D. student; theoretical computer science; 2016 – present (co-advised with Mihalis Yannakakis).

- Gleb Posobin; Ph.D. student; theoretical computer science; 2018 – present (co-advised with Omri Weinstein).
- Timothy Randolph; Ph.D. student; theoretical computer science; 2018 – present (co-advised with Xi Chen).
- Sandip Sinha; Ph.D. student; theoretical computer science; 2016 – present (co-advised with Alexandr Andoni, Cliff Stein).
- Timothy Sun; Ph.D. student; theoretical computer science; 2016 – present (co-advised with Xi Chen).
- Erik Waingarten; Ph.D. student; theoretical computer science; 2015 – present (co-advised with Xi Chen).

Postdoctoral Associates:

- Jonathan Ullman (Ph.D. Harvard University) 2014–2015
(started tenure-track assistant professorship at Northeastern in 2015)
- Ariel Gabizon (Ph.D. Weizmann Institute) 2009–2010
(currently Visiting Researcher at the Technion)
- Ragesh Jaiswal (Ph.D. UC San Diego) 2008–2010
(currently Assistant Professor of Computer Science at IIT Delhi)
- Troy Lee (Ph.D. Centrum Wiskunde & Informatica (CWI), Netherlands) 2008–2009
(currently Senior Research Fellow at the Centre for Quantum Technologies in Singapore)
- Hoeteck Wee (Ph.D. UC Berkeley) 2007–2008
(currently Assistant Professor of Computer Science at Ecole Normale Supérieure)
(co-supervised with Tal Malkin).
- Emanuele Viola (Ph.D. Harvard University) 2007–2008
(currently Associate Professor of Computer Science at Northeastern University)

Other funded visitors:

- John Wright (Ph.D. student, Carnegie Mellon University) June 2014 – August 2014
- Anindya De (research scientist, Institute for Advanced Study) June 2014 – July 2014
- Dr. Sung-Soon Choi (Research Professor, Yonsei University, Korea) May 2012 – August 2012
- Clement Canonne (M.S. student, Ecole Centrale Paris) May 2012 – August 2012
- Anindya De (Ph.D. student, UC Berkeley) May 2012 – August 2012,
May 2011 – August 2011
- Karl Wimmer (Ph.D. student, Carnegie Mellon University) June 2008 – August 2008
- Yi Wu (Ph.D. student, Carnegie Mellon University) May 2008 – August 2008
- Alexander Sherstov (Ph.D. student, UT Austin) May 2006 – August 2006

Outreach Efforts

- Served as co-chair of working group on “Natural Sciences” for “Visions for Theoretical Computer Science,” sponsored by Computing Community Consortium, 2008. Helped create “vision nuggets” giving a concise summary description, in language understandable by people outside of theory, of key questions and challenges in theoretical computer science.
- Taught dynamic programming (a computer science technique usually introduced in college) to elementary school students in an after-school mathematics club at The School at Columbia, 2009.
- Five-time participant in “Science Expo” for elementary school students and their families at The School at Columbia, in 2010, 2012, 2014, 2016, 2018. Designed, created, and ran a hands-on exhibit introducing a general audience to great ideas in theoretical computer science and discrete mathematics (computational efficiency and intractability, parity-check codes and efficient communication).

Research Funding History

- NSF IIS – Big Data Grant 2018
 Title: BIGDATA: F: Big Data Analysis via Non-Standard Property Testing
 Co-PI: X. Chen, Columbia University
 My share of funding: \$455,000 over three years
- NSF CCF – Algorithmic Foundations Grant in Computer Science 2018
 Title: Collaborative Research: Boolean function analysis meets stochastic design
 Co-PI: A. De, Northwestern University
 My share of funding: \$166,270 over three years
- Simons Collaboration on Algorithms and Geometry 2018
 One of twelve co-PIs
 My share of funding: \$240,000 over three years
- NSF CCF – Algorithmic Foundations grant in Computer Science 2018
 Title: AF: Student Travel Support for CCC 2018
 \$15,000 over one year
- NSF CCF – Algorithmic Foundations grant in Computer Science 2017
 Title: AF: Student Travel Support for CCC 2017
 \$15,000 over one year
- NSF CCF – Algorithmic Foundations grant in Computer Science 2016
 Title: AF: Medium: Circuit Lower Bounds via Projections
 Co-PI: L.-Y. Tan, Toyota Technological Institute
 My share of funding: \$841,512 over four years
- NSF CCF – Algorithmic Foundations grant in Computer Science 2014
 Title: AF: Small: Linear and Polynomial Threshold Functions:
 Structural Analysis and Algorithmic Applications
 \$450,000 over three years (sole PI)
- NSF CCF – Algorithmic Foundations grant in Computer Science 2013
 Title: AF: Small: Learning and Testing Classes of Distributions
 \$471,875 over three years (sole PI)
- NSF CCF – Algorithmic Foundations grant in Computer Science 2011
 Title: AF: Small: The Boundary of Learnability for Monotone Boolean Functions
 \$350,000 over three years (sole PI)
- Google Research Award 2010
 Title: Noise-Tolerant Learning via Outlier Removal
 \$70,000 (sole PI)
- NSF CCF – Algorithmic Foundations grant in Computer Science 2009
 Title: AF: The Polynomial Method in Learning
 Co-PI: R. O'Donnell, Carnegie Mellon University
 My share of funding: \$300,000 over three years
- DARPA Computer Science Study Group Phase II 2008
 Title: Efficient and Effective Learning from Incomplete and Noisy Data
 \$500,000 over two years (sole PI)
- Google Research Award 2008
 Title: Martingale Ranking
 \$70,000 (sole PI)
- NSF CyberTrust grant in Computer Science 2007
 Title: CT-ISG: Cross-Leveraging Cryptography with Learning Theory
 Co-PI: T. Malkin, Columbia University
 My share of funding: \$187,500 over three years
- DARPA Computer Science Study Group 2007

Title: Theoretical Foundations of Efficient Machine Learning Algorithms
\$100,000 over one year (sole PI)

- NSF Emerging Models and Technologies (EMT) grant in Computer Science 2005
Title: QnTM: Quantum Computational Learning
\$280,000 over three years (sole PI)
- Alfred P. Sloan Foundation Research Fellowship in Computer Science 2005
\$45,000 over two years (sole PI)
- NSF Faculty Early Career Award in Theoretical Foundations of Computing 2004
Title: CAREER: Efficient Learning Algorithms for Rich Function Classes
\$400,000 over five years (sole PI)
- NSF Mathematical Sciences Postdoctoral Research Fellowship 2001
Title: Efficient Algorithms in Computational Learning Theory
\$90,000 over two years.