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## Areas of Interest

Complexity Theory, Analysis of Boolean functions, Learning theory, Applied Probability

## Education

- **University of California, Berkeley**  
Ph.D. in Computer Science -2008-2013  
Research advisor: Luca Trevisan  
Chair of Dissertation Committee: Umesh V. Vazirani and Luca Trevisan
- **Indian Institute of Technology, Kanpur, India**  
B.Tech in Computer Science and Engineering - 2004-2008

## Employment

- **Assistant Professor:** EECS, Northwestern University, 2015-current.
- **Postdoctoral associate:** DIMACS, Rutgers (Mentor: Prof. Michael Saks), 2014-15.
- **Visitor:** School of Math, Institute for Advanced Study, 2014-15.
- **Member:** School of Math, Institute for Advanced Study (Mentor: Prof. Avi Wigderson), 2013-14.
- **Research fellow:** Simons Institute, UC Berkeley (Mentor: Prof. Luca Trevisan), Fall 2013.
- **Visiting researcher:** New York University (with Prof. Oded Regev), May-August 2013.
- **Visiting researcher:** Columbia University (with Prof. Rocco A. Servedio), May-August 2011, 2012.

## Awards

- IBM Pat Goldberg Memorial best paper award for 2014 for “Nearly optimal solutions for the Chow Parameters Problem and low-weight approximation of halfspaces”.
- Co-winner of the best student paper award at Theory of Cryptography Conference (TCC) 2012.
- Berkeley fellowship for Graduate Study 2008-2010
- President of India Gold Medal for the best academic performance among all departments in graduating class of 2008 at IIT Kanpur

## Journal publications

- **A new central limit theorem and decomposition for Gaussian polynomials, with an application to deterministic approximate counting**  
(with Rocco Servedio), *Probability Theory and Related Fields*, 2017.
- **Inverse Shapley Value Problem**  
(with Ilias Diakonikolas and Rocco Servedio), *Games and Economic Behavior*, 2017.
- **A Robust Khintchine Inequality, and Algorithms for Computing Optimal Constants in Fourier Analysis and High-Dimensional Geometry**  
(with Ilias Diakonikolas and Rocco Servedio), *SIAM Journal on Discrete Math*, 2016.
- **Majority is Stablest: Discrete and SoS**  
(with Elchanan Mossel and Joe Neeman), *Theory of Computing*, 2016.
- **Nearly optimal solutions for the Chow parameters problem and low-weight approximations of halfspaces**  
(with Ilias Diakonikolas, Vitaly Feldman and Rocco Servedio), *Journal of the ACM*, 2014.
- **Explicit optimal hardness via Gaussian stability results**  
(with Elchanan Mossel), *ACM Transaction of Computation Theory*, 2013.
- **Fast Integer Multiplication using Modular Arithmetic**  
(with Piyush P Kurur, Chandan Saha and Ramprasad Saptharishi), *SIAM Journal on Computing*, 2013.
- **Trevisan's extractor in the presence of quantum side information**  
(with Christopher Portmann, Thomas Vidick and Renato Renner), *SIAM Journal on Computing*, 2012.
- **Extractors and lower bounds for locally samplable distributions**  
(with Thomas Watson), *ACM Transaction of Computation Theory*, 2012.

## Conference publications

- **Boolean function analysis meets stochastic optimization: An approximation scheme for stochastic knapsack**  
*SODA*, 2018
- **Non-interactive simulation of correlated distributions is decidable**  
(with Elchanan Mossel and Joe Neeman), *SODA*, 2018
- **Optimal mean-based algorithms for trace reconstruction**  
(with Ryan O'Donnell and Rocco Servedio), *STOC*, 2017
- **Noise stability is computable and low-dimensional**  
(with Elchanan Mossel and Joe Neeman), *CCC*, 2017
- **Noisy population recovery in polynomial time**  
(with Michael Saks and Sijian Tang), *FOCS*, 2016
- **A size free CLT for poisson multinomials and its applications.**  
(with Costis Daskalakis, Gautam Kamath and Christos Tzamos), *STOC*, 2016
- **Beyond the central limit theorem: asymptotic expansions and pseudorandomness for combinatorial sums**  
*FOCS*, 2015
- **Boolean monotonicity testing requires (almost)  $n^{1/2}$  non-adaptive queries**  
(with Xi Chen, Rocco Servedio and Li-Yang Tan), *STOC*, 2015

- **Learning distributions from satisfying assignments**  
(with Ilias Diakonikolas and Rocco Servedio), *SODA*, 2015
- **Efficient deterministic approximate counting for low-degree PTFs**  
(with Rocco Servedio), *STOC*, 2014.
- **Deterministically counting satisfying assignments for juntas of degree-2 PTFs**  
(with Ilias Diakonikolas and Rocco Servedio), *CCC*, 2014.
- **A Polynomial time approximation scheme for fault-tolerant distributed storage**  
(with Costis Daskalakis, Ilias Diakonikolas, Ankur Moitra and Rocco Servedio), *SODA*, 2014.
- **Majority is Stablest : Discrete and SoS**  
(with Elchanan Mossel and Joe Neeman), *STOC*, 2013.
- **A Robust Khintchine Inequality, and Algorithms for Computing Optimal Constants in Fourier Analysis and High-Dimensional Geometry**  
(with Ilias Diakonikolas and Rocco Servedio), *ICALP*, 2013.
- **Nearly optimal solutions for the Chow parameters problem and low-weight approximations of halfspaces**  
(with Ilias Diakonikolas, Vitaly Feldman and Rocco Servedio), *STOC*, 2012.
- **The Inverse Shapley Value Problem**  
(with Ilias Diakonikolas and Rocco Servedio), *ICALP*, 2012.
- **Lower bounds in Differential Privacy**  
*TCC*, 2012.
- **Pseudorandomness for permutation and regular branching programs**  
*CCC*, 2011.
- **Extractors and lower bounds for locally samplable distributions**  
(with Thomas Watson), *APPROX-RANDOM*, 2011.
- **Non-uniform attacks against one-way functions and PRGs**  
(with Luca Trevisan and Madhur Tulsiani), *CRYPTO*, 2010.
- **Near optimal extractors against quantum storage**  
(with Thomas Vidick), *QIP*, 2010 , *STOC*, 2010.
- **Improved pseudorandom generators against DNFs**  
(with Omid Etesami, Luca Trevisan and Madhur Tulsiani), *APPROX-RANDOM*, 2010.
- **Extractors using hardness amplification**  
(with Luca Trevisan), *APPROX-RANDOM*, 2009.
- **Fast Integer Multiplication using Modular Arithmetic**  
(with Piyush P Kurur, Chandan Saha and Ramprasad Saptharishi), *STOC*, 2008.

## Manuscripts under review

- **Density estimation for compactly supported shift invariant distributions**  
(with Philip Long and Rocco Servedio)
- **Efficient algorithms for learning sums of independent commonly support random variables**  
(with Philip Long and Rocco Servedio)
- **Tight sample complexity lower bounds for learning sums of independent commonly support random variables**  
(with Philip Long and Rocco Servedio)

## Teaching Experience

- **Instructor:** Theory of Computation (Rutgers, Northwestern), Intro to computational learning theory (Northwestern), Analytical methods in computer science (Northwestern)
- **Teaching Assistant:** Introduction to Algorithms (Berkeley)

## Professional Experience

- **Conference Program Committee :** RANDOM 2015, CCC 2016, FOCS 2017.
- **Conference Refereeing :** STOC, FOCS, CCC, RANDOM, TCC, PODS, SOFSEM, STACS, SODA, ICALP, ESA, FSTTCS
- **Journal Refereeing :** SIAM J. on Computing, SIAM J. on Discrete Math., Theory of Computing, Algorithmica