

MADHUR TULSIANI

Toyota Technological Institute at Chicago
6045 S Kenwood Avenue
Chicago, IL 60637

phone: (773) 834-1795
email: madhurt@ttic.edu
<http://ttic.uchicago.edu/~madhurt>

RESEARCH INTERESTS Complexity Theory, Optimization, Approximation and Inapproximability, Pseudorandomness, Arithmetic Combinatorics.

EDUCATION ◇ **University of California, Berkeley**
Ph.D. in Computer Science (2005-2009)
Thesis: *Local Constraints in Combinatorial Optimization*
Advisor: Luca Trevisan
◇ **Indian Institute of Technology, Kanpur, India**
B.Tech in Computer Science and Engineering (2001-2005)

EMPLOYMENT ◇ **Assistant Professor:** Toyota Technological Institute at Chicago, 2011-current
◇ **Assistant Professor (Part Time):** Department of Computer Science, University of Chicago, 2011-current
◇ **Postdoctoral Researcher:** Institute for Advanced Study and Princeton University, 2009-11
◇ **Summer Intern:** Microsoft Research Bangalore (India), Summer 2008 and 2009
◇ **Teaching Assistant:** CS170 (Fall 2006), CS172 (Spring 2007) and CS70 (Spring 2009).
◇ **Summer Intern:** INRIA Rocquencourt, Le Chesnay (France), Summer 2004.

AWARDS ◇ National Science Foundation Career Award, 2013
◇ Outstanding GSI (Graduate Student Instructor) Award, UC Berkeley, Fall 2006
◇ UC Berkeley Regents fellowship (2005-06)
◇ President's Gold Medal for best academic performance among all departments in graduating class of 2005 at IIT Kanpur
◇ Director's Gold Medal for best all-round achievement and leadership in graduating class of 2005 at IIT Kanpur
◇ Academic Excellence Awards from IIT Kanpur for the years 2001-02, 2002-03 and 2003-04

SERVICE ◇ Referee for STOC, FOCS, SODA, CCC, TCC, ITCS, STACS, Theory of Computing, SIAM Journal on Computing.
◇ Program Committee member for STOC 2012, APPROX 2013, FSTTCS 2013, CCC 2014.
◇ Member of the editorial board for the journal *Theory of Computing*

PUBLICATIONS 1. **A Linear Round Lower Bound for Lovász-Schrijver SDP Relaxations of Vertex Cover**
(with Grant Schoenebeck and Luca Trevisan)
In *Proc. of 22nd Computational Complexity Conference, IEEE, 2007*

2. **Tight Integrality Gaps for Lovász-Schrijver LP Relaxations of Vertex Cover and Max Cut**
(with Grant Schoenebeck and Luca Trevisan), In *Proc. of 39th STOC*, ACM, 2007
3. **Unique Games on Expanding Constraint Graphs are Easy**
(with Sanjeev Arora, Subhash Khot, Alexandra Kolla, David Steurer and Nisheeth Vishnoi)
In *Proc. of 40th STOC*, ACM, 2008
4. **Dense Subsets of Pseudorandom Sets**
(with Omer Reingold, Luca Trevisan and Salil Vadhan), In *Proc. of 49th FOCS*, IEEE, 2008
5. **CSP Gaps and Reductions in the Lasserre Hierarchy**
In *Proc. of 41st STOC*, ACM, 2008
6. **Boosting, Regularity, and Efficiently Simulating Every High-Entropy Distribution**
(with Luca Trevisan and Salil Vadhan)
In *Proc. of 24th Computational Complexity Conference*, IEEE, 2009
7. **SDP Gaps from Pairwise Independence**
(with Siavosh Benabbas, Costis Georgiou and Avner Magen)
In *Proc. of 12th APPROX*, 2009
8. **SDP Gaps for 2-to-1 and other Label Cover Variants**
(with Venkatesan Guruswami, Subhash Khot, Preyas Papat, Ryan O'Donnell and Yi Wu)
In *Proc. of 37th International Colloquium on Automata, Languages and Programming*, 2010
9. **Time-Space Tradeoffs for Attacks against One-Way Functions and PRGs**
(with Anindya De and Luca Trevisan)
In *Proc. of 30th International Cryptology Conference (CRYPTO)*, 2010
10. **Improved Pseudorandom Generators for Depth 2 Circuits**
(with Anindya De, Omid Etesami and Luca Trevisan)
In *Proc. of 14th RANDOM*, 2010
11. **Algorithms and Hardness for Subspace Approximation**
(with Amit Deshpande and Nisheeth Vishnoi)
In *Proc. of the 22nd ACM-SIAM Symposium on Discrete Algorithms*, 2011
12. **On LP-based Approximability for Strict CSPs**
(with Amit Kumar, Rajsekar Manokaran and Nisheeth Vishnoi)
In *Proc. of the 22nd ACM-SIAM Symposium on Discrete Algorithms*, 2011
13. **Lovász-Schrijver Reformulation**
In Wiley Encyclopedia of Operations Research & Management Science
14. **Convex Relaxations and Integrality Gaps**
(with Eden Chlamtac)
In Handbook on Semidefinite, Cone and Polynomial Optimization
15. **Quadratic Goldreich-Levin Theorems**
(with Julia Wolf), In *Proc. of 52nd FOCS*, IEEE, 2011
16. **Graph Densification**
(with Moritz Hardt and Nikhil Srivastava), In *Proc. of 3rd ITCS*, 2012
17. **Reductions between Expansion Problems**
(with Prasad Raghavendra and David Steurer)
In *Proc. of 27th Computational Complexity Conference*, IEEE, 2012

18. **Cuts in Cartesian Products of Graphs**
(with Sushant Sachdeva), *Manuscript*
19. **LS+ gaps from Pairwise Independence**
(with Pratik Worah), In *Proc. of 28th Computational Complexity Conference*, IEEE, 2013
20. **Towards an Optimal Query Efficient PCP?**
(with Subhash Khot and Muli Safra), In *Proc. of 4th ITCS*, 2013
21. **Sampling Based Proofs of Almost Periodicity and Algorithmic Applications**
(with Eli Ben-Sasson, Noga Ron-Zewi and Julia Wolf), *Manuscript*
22. **A Characterization of Strong Approximation Resistance**
(with Subhash Khot and Pratik Worah), *Manuscript*
23. **Algorithmic Regularity for Polynomials and Applications**
(with Pooya Hatami and Arnab Bhattacharyya), *Manuscript*

CO-AUTHORS Sanjeev Arora, Siavosh Benabbas, Eli Ben-Sasson, Arnab Bhattacharyya, Eden Chlamtac, Anindya De, Amit Deshpande, Omid Etesami, Venkatesan Guruswami, Moritz Hardt, Pooya Hatami, Costis Georgiou, Subhash Khot, Amit Kumar, Avner Magen, Rajsekar Manokaran, Ryan O'Donnell, Preyas Popat, Prasad Raghavendra, Noga Ron-Zewi, Susant Sachdeva, Muli Safra, Grant Schoenebeck, Nikhil Srivastava, David Steurer, Luca Trevisan, Salil Vadhan, Nisheeth Vishnoi, Julia Wolf, Pratik Worah, Yi Wu.