

ROHIT GURJAR

Postdoctoral Fellow
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Research Interests

Computational Complexity, Derandomization, Combinatorics, Algebra

Research Experience and Education

Tel Aviv University Oct'16-
Postdoctoral Fellow
Advisor: Prof. Amir Shpilka

Ulm University Sep'15-Sep'16
Postdoctoral Fellow
Advisor: Prof. Thomas Thierauf

Indian Institute of Technology Kanpur 2010-2015
PhD, Computer Science and Engineering
Advisors: Prof. Manindra Agrawal and Prof. Nitin Saxena
PhD Thesis: Derandomizing PIT for ROABP and Isolation Lemma for Special Graphs
CPI: 9.5/10

Indian Institute of Technology Kanpur 2005-2010
B.Tech. & M.Tech. Dual Degree, Computer Science and Engineering
Advisor: Prof. Piyush P. Kurur M.Tech. Thesis: Matching in Planar Graphs
CPI: 9.1/10 (UG), 10/10 (PG)

Publications

- Linear Matroid Intersection is in quasi-NC
with *Thomas Thierauf*
Submitted to STOC 2017.
- Bipartite Perfect Matching is in quasi-NC
with *Stephen A. Fenner and Thomas Thierauf*
Symposium on Theory of Computing (STOC) 2016
Invited to STOC 2016 special issue in SIAM Journal on Computing
- Identity Testing for constant-width, and commutative, read-once oblivious ABPs
with *Arpita Korwar and Nitin Saxena*
Computational Complexity Conference (CCC) 2016
Invited to special issue of the journal Theory of Computing for CCC 2016

- Derandomizing Isolation Lemma for $K_{3,3}$ -free and K_5 -free Bipartite Graphs
with *Rahul Arora, Ashu Gupta and Raghunath Tewari*
International Symposium on Theoretical Aspects of Computer Science (STACS 2016)
- Deterministic Identity Testing for Sum of Read Once ABPs
with *Arpita Korwar, Nitin Saxena and Thomas Thierauf*
Computational Complexity Conference (CCC) 2015
Journal of Computational Complexity 2016
- Hitting-sets for ROABP and Sum of Set-Multilinear Circuits
with *Manindra Agrawal, Arpita Korwar and Nitin Saxena*
SIAM Journal of Computing (SICOMP) 2015
- Planarizing Gadgets for Perfect Matching do not Exist
with *Arpita Korwar, Jochen Messner, Simon Straub and Thomas Thierauf*
37th International Symposium on Mathematical Foundations of Computer Science (MFCS), 2012
ACM Transactions on Computation Theory (TOCT) 2016

Other Reports

- Exact Perfect Matching in Complete Graphs
with *Arpita Korwar, Jochen Messner and Thomas Thierauf*
- On Two-Level Poset Games
with *Stephen A. Fenner, Arpita Korwar and Thomas Thierauf*

Talks

- Linear Matroid Intersection is in quasi-NC.
 - Theory of Computation Seminar, Tel Aviv University (Nov 2016)
 - Dagstuhl Seminar on Algebraic Methods in Computational Complexity (Oct 2016)
- Bipartite Matching is in quasi-NC.
 - Mysore Park Theory Workshop (Aug 2016)
 - Symposium on the Theory of Computing (STOC) (Jun 2016)
 - IISc Bangalore (March 2016)
 - Workshop on Algebraic Complexity Theory (Feb 2016)
 - Dagstuhl Seminar on Circuits, Logic and Games (Sep 2015)
- Identity Testing for constant-width, and commutative, read-once oblivious ABPs
 - Computational Complexity Conference (CCC) (May 2016)

- Deterministic Identity Testing for Sum of Read Once ABPs
 - Computational Complexity Conference (CCC) (Jun 2015)
- Hitting Set for Read Once Arithmetic Branching Programs
 - Dagstuhl Seminar on Algebra in Computational Complexity (Sep 2014)
- SIGTACS seminar series, CSE, IIT Kanpur
 - Derandomizing Isolation Lemma for $K_{3,3}$ -free and K_5 -free bipartite graphs (Jan 2015)
 - Small bias spaces and pseudorandomness for branching programs (Jan 2014)
 - Polynomial identity testing via Rank condensers (Dec 2013)
 - Planar Matching Polytope (Mar 2013)
 - Compact Linear Programming Formulations (Jan 2013)
 - Planar Graph Isomorphism (Nov 2012)
 - POSET Games and Sprague-Grundy Theorem (Aug 2012)
 - Perfect Matching in bipartite planar graphs (Mar 2012)
 - A deterministic algorithm for k-SAT (Jan 2012)

Research Visits

- Indian Institute of Science, Bangalore (with Chandan Saha) March 2016 and May 2014
 - Studied reconstruction of iterated matrix products
 - Studied polynomials computed by a sum of set-multilinear circuits.
- Microsoft Research India (with Nisheeth Vishnoi) Feb 2013
 - Studied connections between computational complexity and extension complexity of polytopes.
- University of Ulm (with Thomas Thierauf) July 2012 and Jul-Aug 2011
 - Worked on bipartite matching and two-level Poset games.
 - Worked on Planarizing gadgets for perfect matching and exact matching in complete graphs.

Teaching Assistant

At IIT Kanpur:

Computational Algebra and Number Theory	Randomized Algorithms
Riemann Hypothesis and Its Applications	Computational Complexity
Discrete Mathematics	Algorithms
Introduction to Mathematical Logic	Principles of Programming Languages
Fundamentals of Computing	

Awards

- TCS Research Fellowship 2011
- Academic Excellence Award in IIT Kanpur for academic year 2005-06
- Indian National Physics Olympiad (INPhO) 2005
- NTSE (National Talent Search Examination) Scholarship 2003