Rajesh Chitnis

BASIC INFORMATION

Current Position: I-CORE Postdoctoral Fellow at Weizmann Institute, Israel

Contact Information: Room 205, Ziskind Building, Faculty of Mathematics and Computer Science
Weizmann Institute of Science, Rehovot 7610001, Israel
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RESEARCH INTERESTS

Fixed-Parameter Algorithms, Streaming Algorithms, Algorithmic Game Theory

EDUCATION

- **Weizmann Institute of Science**, Rehovot, Israel
  I-CORE Postdoctoral Fellow **September '14 - present**
  Mentors: Prof. Robi Krauthgamer and Prof. Uri Feige

- **University of Maryland**, College Park, MD USA
  Doctor of Philosophy, Computer Science **August '10 - December '14**
  Title of Dissertation: Directed Graphs: Fixed-Parameter Tractability and Beyond
  Larry S. Davis Doctoral Dissertation Award
  Adviser: Prof. MohammadTaghi Hajiaghayi

- **University of Maryland**, College Park, MD USA
  Masters in Computer Science **August '10 - May '13**

- **Chennai Mathematical Institute**, Chennai, INDIA
  Bachelor of Science (Honors) **August '07 - April '10**
  Subjects: Mathematics and Computer Science

RESEARCH EXPERIENCE

- Internship at **Toyota Technological Institute, Chicago, USA** **Summer '13**
  Mentor: Prof. Julia Chuzhoy

- Research Visit to **University of Bergen, Norway** **August '12**
  Host: Prof. Fedor Fomin

- Research Visit to **MTA SZTAKI, Hungary** **June - July '12**
  Host: Prof. Dániel Marx

- Internship at **Institute of Mathematical Sciences, India** **Summer '10**
  Mentor: Prof. Saket Saurabh

- Internship at **Indian Institute of Science, India** **Summer '09**
  Mentor: Prof. Sunil Chandran

A copy of this curriculum vitae, publications and other information is available at
`http://www.wisdom.weizmann.ac.il/~chitnis/`

HONORS AND AWARDS

- $48,000 Simons Award for Graduate Students in Theoretical Computer Science (2013-15)
- Larry S. Davis Doctoral Dissertation Award for PhD thesis from University of Maryland. Also nominated for ACM Doctoral Dissertation Award
- College of Computer, Mathematical, & Natural Sciences (CMNS) Board of Visitor's Award for Outstanding Graduate Student at University of Maryland. Awarded to 2 students out of the 10 departments in the college.
- Best Paper Award in ESA 2013
- Gannon Award for Outstanding Graduate Students by University of Maryland (2013)
- International Research Fellowship by University of Maryland for research visits in Summer 2012.
- Dean's Fellowship by University of Maryland (2010-12).

PUBLICATIONS

Manuscripts

1. **Tight Bounds for Gomory-Hu-like Cut Counting**. Joint work with Lior Kamma and Robert Krauthgamer

Journal Papers

2. **Parameterized Complexity of the Anchored k-Core Problem for Directed Graphs**. To appear in *Information and Computation*. Joint work with Fedor Fomin and Petr Golovach.
3. **Directed Subset Feedback Vertex Set is FPT**. In *ACM Transactions on Algorithms* 11(4):28, 2015. Joint work with Marek Cygan, MohammadTaghi Hajiaghayi and Dániel Marx.
4. **Fixed-Parameter Tractability of Directed Multiway Cut Parameterized by Size of the Cutset**. In *SIAM Journal of Computing* 42(4): 1674-1696. (2013). Joint work with Mohammad-Taghi Hajiaghayi and Dániel Marx.
5. **On the SIG dimension of trees under the L_∞ metric**. In *Graphs and Combinatorics* 29(4): 773-794 (2013). Joint work with L. Sunil Chandran and Ramanjit Kumar.

Conference Papers

6. **Kernelization via Sampling with Applications to Dynamic Graph Streams**. In *SODA 2016*. Joint work with Graham Cormode, Hossein Esfandiari, MohammadTaghi Hajiaghayi, Andrew McGregor, Morteza Monemizadeh and Sofya Vorotnikova
7. **New Streaming Algorithms for Parameterized Maximal Matching and Beyond**. In *SPAA 2015* (short paper). Joint work with Graham Cormode, Hossein Esfandiari, MohammadTaghi Hajiaghayi and Morteza Monemizadeh.
8. **Parameterized Streaming Algorithms for Vertex Cover**. In *SODA 2015*. Joint work with Graham Cormode, MohammadTaghi Hajiaghayi and Morteza Monemizadeh.
9. **A Tight Algorithm for Strongly Connected Steiner Subgraph On Two Terminals With Demands**. In *IPEC 2014*. Joint work with Hossein Esfandiari, MohammadTaghi Hajiaghayi, Rohit Khandekar, Guy Kortsarz and Saeed Seddighin.
10. **Tight Bounds for Planar Strongly Connected Steiner Subgraph with Fixed Number of Terminals (and Extensions)**. In *SODA 2014*. Joint work with MohammadTaghi Hajiaghayi and Daniel Marx.

11. **Parameterized Complexity of the Anchored k-Core Problem for Directed Graphs**. In *FSTTCS 2013*. Joint work with Fedor Fomin and Petr Golovach.
12. **Faster Exact Algorithms for Some Terminal Set Problems**. In *IPEC 2013*. Joint work with Fedor Fomin, Daniel Lokshtanov, Pranabendu Misra, M.S. Ramanujan and Saket Saurabh.
13. **Fixed-Parameter and Approximation Algorithms: A New Look**. In *IPEC 2013*. Joint work with MohammadTaghi Hajiaghayi and Guy Kortsarz.
14. **List H-Coloring a Graph by Removing a Few Vertices**. In *ESA 2013*. Joint work with Laszlo Egri and Dániel Marx.
15. **Preventing Unraveling in Social Networks Gets Harder**. In *AAAI 2013*. Joint work with Fedor Fomin and Petr Golovach.
16. **A Game-Theoretic Model for the DARPA Network Challenge**. In *SPAA 2013* (short paper). Also appeared in *Workshop on Risk Aversion in Algorithmic Game Theory and Mechanism Design*. Joint work with MohammadTaghi Hajiaghayi, Jonathan Katz and Koyel Mukherjee.
17. **Designing FPT algorithms for Cut Problems using Randomized Contractions**. In *FOCS 2012*. Joint work with Marek Cygan, MohammadTaghi Hajiaghayi, Marcin Pilipczuk and Michal Pilipczuk.
18. **Directed Subset Feedback Vertex Set is FPT**. In *ICALP 2012*. Joint work with Marek Cygan, MohammadTaghi Hajiaghayi and Dániel Marx.
19. **Fixed-Parameter Tractability of Directed Multiway Cut Parameterized by Size of the Cutset**. In *SODA 2012*. Joint work with MohammadTaghi Hajiaghayi and Dániel Marx.
20. **Parameterized Complexity of Problems in Coalitional Resource Games**. In *AAAI 2011*. Joint work with MohammadTaghi Hajiaghayi and Vahid Liaghat.
21. **Parameterized Algorithms for Boxicity**. In *ISAAC 2010*. Joint work with Abhijin Adiga and Saket Saurabh.

Book Chapters

22. **Shadowless Solutions for Fixed-Parameter Tractability of Directed Graphs**. In *Encyclopedia of Algorithms* (2015). Jointly written with MohammadTaghi Hajiaghayi.

Book Reviews

23. Review of **Fundamentals of Parameterized Complexity** by Rodney G. Downey and Michael R. Fellows. In *SIGACT News* 46(1): 23-26. (2015)

COLLABORATORS

Abhijin Adiga, L. Sunil Chandran, Graham Cormode, Marek Cygan, Laszlo Egri, Hossein Esfandiari, Fedor V. Fomin, Petr A. Golovach, MohammadTaghi Hajiaghayi, Lior Kamma, Jonathan Katz, Rohit Khandekar, Guy Kortsarz, Robert Krauthgamer, Ramanjit Kumar, Vahid Liaghat, Daniel Lokshtanov, Dániel Marx, Andrew McGregor, Pranabendu Misra, Morteza Monemizadeh, Koyel Mukherjee, Marcin Pilipczuk, Michal Pilipczuk, M.S. Ramanujan, Saket Saurabh, Saeed Seddighin, Sofya Vorotnikova.

SELECTED TALKS

Fixed-Parameter Tractability of Directed Multiway Cut Parameterized by Size of the Cutset

- CATS Seminar at University of Maryland, USA - Dec '11
- Institute of Mathematical Sciences, India - January '12
- SODA at Kyoto, Japan - January '12

- University of Bergen, Norway - August '12

Fixed-Parameter and Approximation Algorithms: A New Look

- CATS Seminar at University of Maryland, USA - March '13
- Dagstuhl Seminar 13121, Germany - March '13
- IPEC at Sophia Antipolis, France - September '13
- Weizmann Theory Lunch, Israel - November '14

TEACHING EXPERIENCE

- Teaching Assistant for CMSC 858F - Algorithmic Game Theory in Spring 2014
  Duties included grading homeworks.
- Teaching Assistant for CMSC 351 - Introduction to Algorithms in Spring 2013
  Duties included preparing homeworks, holding office hours, grading homeworks and exams.
- Teaching Assistant for CMSC 351 - Introduction to Algorithms in Spring 2012
  Duties included preparing lecture notes and grading exams.
- Teaching Assistant for CMSC 250 - Discrete Structures in Spring 2011
  Duties included conducting discussion sections, holding office hours, grading homeworks and exams.
- Teaching Assistant for CMSC 451 - Algorithms in Fall 2010
  Duties included holding office hours, grading homeworks and exams.

PROFESSIONAL SERVICE

- **Reviewer for Conferences:** FOCS, STOC, SODA, ICALP, STACS, ESA, IPEC, FSTTCS, SPAA, WG, LATIN, SWAT, WINE, WALCOM, SOFSEM.
- **Reviewer for Journals:** SIAM Journal on Computing, ACM Transactions on Algorithms, Algorithmica, SIAM Journal on Discrete Mathematics, Combinatorica, ACM Transactions on Computation Theory, Theoretical Computer Science, Networks, Journal of Discrete Algorithms, Information and Computation.
- Member of Admissions Committee at Department of Computer Science, University of Maryland for Fall '13 and Fall '14 applicants.