Rajesh Chitnis

BASIC INFORMATION

Current Position: 4th Year PhD Student
Department of Computer Science
University of Maryland, College Park

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RESEARCH INTERESTS

Fixed-Parameter Algorithms, Algorithmic Game Theory, Structural Graph Theory

EDUCATION

University of Maryland, College Park, MD USA
Doctor of Philosophy, Computer Science **Fall 2010 - Present**
Title of Dissertation: Directed Graphs: Fixed-Parameter Tractability and Beyond
Adviser: Prof. MohammadTaghi Hajiaghayi

University of Maryland, College Park, MD USA
Masters in Computer Science **Fall 2010 - Spring 2013**

Chennai Mathematical Institute, Chennai, INDIA
Bachelor of Science (Honors) **Fall 2007 - Spring 2010**
Subjects: Mathematics and Computer Science

RESEARCH EXPERIENCE

Internship at **Toyota Technological Institute, Chicago, USA** **Summer 2013**
Mentor: Prof. Julia Chuzhoy

Research Visit to **University of Bergen, Norway** **August 2012**
Host: Prof. Fedor Fomin

Research Visit to **MTA SZTAKI, Hungary** **June - July 2012**
Host: Prof. Dániel Marx

Internship at **Institute of Mathematical Sciences, India** **Summer 2010**
Mentor: Prof. Saket Saurabh

Internship at **Indian Institute of Science, India** **Summer 2009**
Mentor: Prof. Sunil Chandran

HONORS AND AWARDS

- $48,000 Simons Award for Graduate Students in Theoretical Computer Science (2013-15)
- 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).
- Undergraduate scholarship by Indian National Board for Higher Mathematics (2007-10)

PUBLICATIONS

Journal Publications

1. **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.
2. **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 MohammadTaghi Hajiaghayi and Dániel Marx.
3. **Directed Subset Feedback Vertex Set is FPT**. To appear in *ACM Transactions on Algorithms*. Joint work with Marek Cygan, MohammadTaghi Hajiaghayi and Dániel Marx.

Conference Publications

4. **Parameterized Streaming Algorithms for Vertex Cover**. In *SODA 2015*. Joint work with Graham Cormode, MohammadTaghi Hajiaghayi and Morteza Monemizadeh.
5. **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.
6. **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.
7. **Parameterized Complexity of the Anchored k-Core Problem for Directed Graphs**. In *FSTTCS 2013*. Joint work with Fedor Fomin and Petr Golovach.
8. **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.
9. **Fixed-Parameter and Approximation Algorithms: A New Look**. In *IPEC 2013*. Joint work with MohammadTaghi Hajiaghayi and Guy Kortsarz.
10. **List H-Coloring a Graph by Removing a Few Vertices**. In *ESA 2013*. Joint work with Laszlo Egri and Dániel Marx.
11. **Preventing Unraveling in Social Networks Gets Harder**. In *AAAI 2013*. Joint work with Fedor Fomin and Petr Golovach.
12. **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.
13. **Designing FPT algorithms for Cut Problems using Randomized Contractions**. In *FOCS 2012*. Joint work with Marek Cygan, MohammadTaghi Hajiaghayi, Marcin Pilipczuk and Michal Pilipczuk.
14. **Directed Subset Feedback Vertex Set is FPT**. In *ICALP 2012*. Joint work with Marek Cygan, MohammadTaghi Hajiaghayi and Dániel Marx.
15. **Fixed-Parameter Tractability of Directed Multiway Cut Parameterized by Size of the Cutset**. In *SODA 2012*. Joint work with MohammadTaghi Hajiaghayi and Dániel Marx.
16. **Parameterized Complexity of Problems in Coalitional Resource Games**. In *AAAI 2011*. Joint work with MohammadTaghi Hajiaghayi and Vahid Liaghat.
17. **Parameterized Algorithms for Boxicity**. In *ISAAC 2010*. Joint work with Abhijin Adiga and Saket Saurabh.

COLLABORATORS

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

SELECTED TALKS

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

- CATS Seminar at University of Maryland - 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 - March '13
- Dagstuhl Seminar 13121, Germany - March '13
- IPEC at Sophia Antipolis, France - September '13

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

RELEVANT GRADUATE COURSEWORK

University of Maryland, USA:
Network Design Foundations, Models for Socio-Technical Networks, Algorithmic Game Theory, Introduction to Game Theory, Introduction to Cryptography, Computational Geometry, Privacy Enhancing Technologies: From Theory to Practice, Ramsey Theory and its "Applications", Numerical Analysis.

Institute of Mathematical Sciences, INDIA: (Taken as an undergraduate)
Parameterized Complexity, Approximation Algorithms, Advanced Graph Theory, Computational Complexity, Matchings in Graphs.