

Sourav Chakraborty

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Research Interests: Property Testing, Electronic Commerce, Combinatorics, Computational Complexity, Quantum Computing, Complexity of Boolean Functions, Algorithms.

Job Experience

- Currently Assistant Professor at Chennai Mathematical Institute, India, from September 2010.
- Post Doctorate at the Algorithms and complexity Department in Centrum Wiskunde & Informatica (CWI), Amsterdam, Netherlands, from September 2009 to August 2010.
- Post Doctorate (Lady Davis Fellow) at the Computer Science Department in Technion - Israel Institute of Technology, Haifa, Israel, from October 2008 to August 2009.

Education

- Ph.D., June 2008
Computer Science, The University of Chicago, Chicago, USA.
Thesis Advisor: László Babai
Thesis Title: Models of Query Complexity for Boolean Functions.
- Master of Science (M.Sc.), 2005
Computer Science, The University of Chicago, Chicago, USA.
Thesis Advisor : László Babai
Thesis title: *Sensitivity, Block Sensitivity and Certificate Complexity of Boolean Functions*
- Bachelor of Science (Honours), 2000-2003 Mathematics
Chennai Mathematical Institute, Chennai, India.

Honours and Awards

- Invited Speaker at the “Combinatorics, Groups, Algorithms, and Complexity” - Conference in honor of Laci Babai’s 60th birthday, March 2010.
- Was one of the invited speakers for China Theory Week 2008.

- Received the Chairman's Fellowship in 2003-04 and 2004-05 from The Department of Computer Science, The University of Chicago, Chicago, USA.
- One of twenty award winners in the *Indian National Mathematical Olympiad (INMO) 1999*, National Board of Higher Mathematics (NBHM), India. Selected to attend the *Indian National Mathematical Olympiad Training Camp* in 1999 and 2000.

Internships

- Internship in Microsoft Research, Bangalore, India from July 2007 to September 2007, in the Cryptography, Security and Algorithms group.
- Visited École Normale Supérieure (ENS) in Paris, France, during May-June 2003, as a part of the exchange programme between ENS, Paris and Chennai Mathematical Institute (CMI), Chennai, India.

Thesis and Publications

All my publications and thesis can be found on <http://www.cmi.ac.in/~sourav/webpage/Publications.html>

- Thesis
 - Phd Thesis: *Models of Query Complexity for Boolean Functions*. Department of Computer Science, The University of Chicago, 2008.
 - Masters Thesis: *Sensitivity, Block Sensitivity and Certificate Complexity of Boolean Functions*, Department of Computer Science, The University of Chicago, 2005.
- Journal Papers
 1. *Property Testing of Isomorphism under a Permutation Group Action* - joint work with László Babai. To appear in The ACM Transactions on Computation Theory (ToCT)
 2. *Hardness and Algorithms for Rainbow Connectivity* - joint work with Eldar Fischer, Arie Matsliah and Raphael Yuster. To appear in the Journal of Combinatorial Optimization (JOCO).
- Reviewed Conference Papers
 1. *Cycle Detection, Order Finding and Discrete Log with Jumps* - joint work with David García-Soriano and Arie Matsliah. Innovations in Computer Science (ICS 2011).
 2. *Query Complexity Lower Bounds for Reconstruction of Codes* - joint work with Eldar Fischer and Arie Matsliah. Innovations in Computer Science (ICS 2011).

3. *Tight Bounds for Testing Function Isomorphism* -joint work with David García-Soriano and Arie Matsliah. ACM-SIAM Symposium on Discrete Algorithms (SODA 2011).
 4. *Quantum Query Complexity for Testing Distribution* -joint work with Eldar Fischer, Arie Matsliah and Ronald de Wolf. 30th International Conference on Foundations of Software Technology and Theoretical Computer Science (FSTTCS 2010).
 5. *Market Clearance Pricing in a Metric* -joint work with Nikhil Devanur and Chinmay Karande. The Sixth Workshop on Internet & Network Economics (WINE 2010).
 6. *Monotonicity Testing and Shortest-Path Routing on the cube* -joint work with Jop Briët David García-Soriano and Arie Matsliah. 14th International Workshop on Randomization and Computation (RANDOM 2010)
 7. *Two-phase algorithms for the parametric shortest path problem* - joint work with Eldar Fischer, Oded Lachish and Raphael Yuster. 27th International Symposium on Theoretical Aspects of Computer Science (STACS'10).
 8. *Improved Algorithms for Multi-unit Auction with unknown supplies* - joint work with Nikhil Devanur. The Fifth Workshop on Internet & Network Economics (WINE 2009). Preliminary version appeared at the Forth Workshop on Ad Auctions 2008.
 9. *Hardness and Algorithms for Rainbow Connectivity* - joint work with Eldar Fischer, Arie Matsliah and Raphael Yuster. 26th International Symposium on Theoretical Aspects of Computer Science (STACS'09).
 10. *Testing st -Connectivity* - joint work with Eldar Fischer, Oded Lachish, Arie Matsliah and Ilan Newman. 11th International Workshop on Randomization and Computation (RANDOM 2007), Pages 380-394.
 11. *Zero Error List-Decoding Capacity of the $q/(q-1)$ Channel* - joint work with Jaikumar Radhakrishnan, Nandakumar Raghunathan and Prashant Sasatte. 26th International Conference on Foundations of Software Technology and Theoretical Computer Science (FSTTCS 2006), Pages 129-138.
 12. *Bounds for Error Reduction with few Quantum Queries* - joint work with Jaikumar Radhakrishnan and Nandakumar Raghunathan. 9th International Workshop on Randomization and Computation (RANDOM 2005), Pages 245-256.
 13. *On the Sensitivity of Cyclically-Invariant Functions* 20th Annual IEEE Conference on Computational Complexity (CCC 2005), Pages 163-167.
 14. *Point Set Topological Proof of 'no-retraction' Theorem for 2 and 3 Dimensional Cases* Resonance, journal of science education, Vol 8, No. 10, Pages 63-68.
- Work in Progress
 1. *Testing by Implicit Learning with Fewer Queries* - joint work with David García-Soriano Arie Matsliah.
 2. *Constant Query Locally Decodable Codes against a Computationally Bounded Adversary* - joint work with Rishiraj Bhattacharyya.
 3. *Random Popular Matchings with Multiple Copies* - joint work with Varsha Dani.

Professional Experience, Skills

- Refereed papers for IEEE Conference on Computational Complexity (CCC), IEEE Symposium of Computer Science (FOCS), Fundamentals of Computation Theory (FCT), Foundations of Software Technology and Theoretical Computer Science (FSTTCS), Symposium on Theoretical Aspects of Computer Science (STACS), International Workshop on Randomization and Computation (RANDOM), International Workshop on Graph-Theoretic Concepts in Computer Science (WG), ACM Conference on Electronic Commerce (EC), ACM Symposium on Theory of Computing (STOC) and the journal of Theory of Computation (TOC), the journal of Algorithmica, the journal of Transactions on Algorithms (TALG) and the journal of Random Structures and Algorithms.
- Proficient in programming in Scheme, C and C++.
- Fluent in English, Bengali and Hindi. Can read technical papers in French.

Teaching Experience

Teaching assistant for the following courses at The University of Chicago:

Fundamentals of Computer Programming I (Scheme), Fall quarter 2003;

Honors Introduction to Computer Science 2, Winter quarter 2004;

Fundamentals of Computer Programming III (C++), Spring quarter 2004;

Discrete Mathematics, Fall quarter 2004, 2005, 2007 and Summer quarter (REU) 2005, 2006;

Algorithms, Winter quarter 2005, 2007 and Fall quarter 2006 and Spring quarter 2006, 2007.