Arnab Bhattacharyya

Princeton University
Department of Computer Science
Room 103C
35 Olden Street
Princeton, NJ 08540
arnabb@princeton.edu
http://web.mit.edu/abhatt/www

204A Ewing Street
Princeton, NJ 08540

AREA OF INTEREST

◇ **Theoretical Computer Science**
Sublinear algorithms, coding theory, graph algorithms, arithmetic combinatorics, probability and discrete harmonic analysis

CURRENT POSITION

◇ **Center for Computational Intractability (Princeton, NJ)**
Postdoctoral Research Associate, started Aug. 2011
Mentor: Bernard Chazelle

EDUCATION

◇ **Massachusetts Institute of Technology (Cambridge, MA)**
Ph.D. in Computer Science, 2011
Thesis title: Testability of Linear-Invariant Properties
Advisor: Ronitt Rubinfeld
Krell/Department of Energy Computational Science Graduate Fellow

◇ **Massachusetts Institute of Technology (Cambridge, MA)**
Master of Engineering in Computer Science, 2006
Bachelor of Science in Computer Science and Physics, 2005
M.Eng. Advisor: Gerald J. Sussman

TEACHING

◇ Teaching Assistant for 6.006 (Introduction to Algorithms), MIT, Fall 2010.

◇ Teaching Assistant for 6.001 (Structure and Interpretation of Computer Programs), MIT, Spring 2006.

◇ Teaching Assistant for 6.821 (Programming Languages), MIT, Fall 2005.

◇ Teacher at SPLASH program for the MIT Educational Studies Program in 2002 and 2004.

COMMUNITY ACTIVITIES

◇ Active participant on CSTheory.org, a Q&A site for questions on theoretical computer science

◇ Reviewer for: FOCS, STOC, SODA, CCC, ICALP, APPROX–RANDOM, ESA, STACS, Journal of the ACM, SIAM Journal on Computing, IEEE Transactions on Information Theory, etc.

◇ Reviewer ("Technology Angel") for Information and Communication Technology proposals to the Technopreneur Promotion Programme (TePP), an endeavor operated by the Indian Department of Scientific and Industrial Research.

◇ Member of the CSAIL Student Committee at MIT

JOURNAL PAPERS

- ◇ Piotr Berman, Arnab Bhattacharyya, Konstantin Makarychev, Sofya Raskhodnikova and Grigory Yaroslavtsev. Improved Approximation for the Directed Spanner problem. Invited to appear in a special issue of *Information and Computation* for ICALP 2011.
- ◇ Arnab Bhattacharyya, Elena Grigorescu, Kyomin Jung, Sofya Raskhodnikova, and David Woodruff. Transitive Closure Spanners. *SIAM Journal on Computing* (to appear).
- ◇ Arnab Bhattacharyya, Elena Grigorescu, Madhav Jha, Kyomin Jung, Sofya Raskhodnikova, and David Woodruff. Lower Bounds for Local Monotonicity Reconstruction from Transitive-Closure Spanners. *SIAM Journal on Discrete Math* (to appear).
- ◇ Arnab Bhattacharyya, Victor Chen, Madhu Sudan, and Ning Xie. Testing Linear-Invariant Non-Linear Properties. *Theory of Computing*, 7(1):75–99, 2011.

CONFERENCE PAPERS AND MANUSCRIPTS

- ◇ Arnab Bhattacharyya, Elena Grigorescu, Prasad Raghavendra, and Asaf Shapira. Testing Odd-Cycle-Freeness in Boolean Functions. *Symposium on Discrete Algorithms*, 2012.
- ◇ Arnab Bhattacharyya, Zeev Dvir, Shubhangi Saraf, and Amir Shpilka. Lower Bounds for 2-query LCCs over finite fields. *Symposium on Foundations of Computer Science*, 2011.
- ◇ Piotr Berman, Arnab Bhattacharyya, Konstantin Makarychev, Sofya Raskhodnikova and Grigory Yaroslavtsev. Improved Approximation for the Directed Spanner problem. *International Colloquium on Automata, Languages and Programming*, 2011.
- ◇ Piotr Berman, Arnab Bhattacharyya, Elena Grigorescu, Sofya Raskhodnikova, David Woodruff, and Grigory Yaroslavtsev. Steiner Transitive-Closure Spanners of d-dimensional Posets. *International Colloquium on Automata, Languages and Programming*, 2011.
- ◇ Arnab Bhattacharyya, Elena Grigorescu, Jakob Nordström, and Ning Xie. Separations of Matroid Freeness Properties. Submitted, 2010. Preliminary version available at `http://arxiv.org/abs/1008.4401`.
- ◇ Arnab Bhattacharyya, Piotr Indyk, David Woodruff, and Ning Xie. The Complexity of Linear Dependence Problems in Vector Spaces. *Innovations in Computer Science*, 2011.
- ◇ Arnab Bhattacharyya, Elena Grigorescu, and Asaf Shapira. A Unified Framework for Testing Linear-Invariant Properties. *Symposium on Foundations of Computer Science*, 2010.
- ◇ Arnab Bhattacharyya, Eldar Fischer, Ronitt Rubinfeld, and Paul Valiant. Testing monotonicity of distributions over general partial orders. *Innovations in Computer Science*, 2011.
- ◇ Arnab Bhattacharyya, Swastik Kopparty, Grant Schoenebeck, Madhu Sudan, and David Zuckerman. Optimal testing of Reed-Muller Codes. *Symposium on Foundations of Computer Science*, 2010.
- ◇ Arnab Bhattacharyya and Bernhard Haeupler. Robust Regulatory Networks. Submitted, 2009. Available at `http://arxiv.org/abs/0904.4360`.
- ◇ Arnab Bhattacharyya, Elena Grigorescu, Madhav Jha, Kyomin Jung, Sofya Raskhodnikova, and David Woodruff. Lower Bounds for Local Monotonicity Reconstruction from Transitive-Closure Spanners. *Workshop on Randomization and Computation - RANDOM*, 2010.
- ◇ Arnab Bhattacharyya and Ning Xie. Lower Bounds for Testing Triangle-freeness in Boolean Functions. *Symposium on Discrete Algorithms*, 2010.
- ◇ Arnab Bhattacharyya, Victor Chen, Madhu Sudan, and Ning Xie. Testing Linear-Invariant Non-Linear Properties. *Symposium on Theoretical Aspects of Computer Science*, 2009.
- ◇ Arnab Bhattacharyya, Elena Grigorescu, Kyomin Jung, Sofya Raskhodnikova, and David Woodruff. Transitive Closure Spanners. *Symposium on Discrete Algorithms*, 2009.
- ◇ Arnab Bhattacharyya. A Note on the Distance to Monotoncity of Boolean Functions. Technical Report, 2008. Available at `http://www.eccc.uni-trier.de/report/2008/012`.

- Arnab Bhattacharyya. Morphogenesis on an Amorphous Computer. *ACM International Conference on Computing Frontiers*, 2006.
- Arnab Bhattacharyya. Implementing Probabilistically Checkable Proofs of Proximity. MIT CSAIL Technical Report 998, 2005.

VISITS

- Research visitor at the Technion, Israel Institute of Technology, with Eldar Fischer and at the Hebrew University of Jerusalem with Alex Samorodnitsky (06/18/11-07/04/11).
- Summer Intern at IBM Almaden Research Center, with David P. Woodruff (05/01/10 – 07/30/10).
- Research visitor at Microsoft Research India, with Ravi Kannan (01/04/10 – 01/28/10)
- Research visitor at the Technion, Israel Institute of Technology, with Eldar Fischer (05/28/09 – 06/12/09)

TALKS

- "A Vision through the Computational Lens". Young Investigator Meeting, Boston (10/09/2011).
- "Tight Lower Bounds for 2-query LCCs over Finite Fields". Microsoft Research Silicon Valley Theory Seminar (10/05/2011), Stanford Theory Lunch (10/06/2011), FOCS (10/25/2011).
- "Testing Odd-Cycle-Freeness of Boolean Functions". Technion Theory Seminar (06/30/2011).
- "A Universal Framework for Testing Linear-Invariant Properties". ITCSC Mini-workshop on the Theory of Computing at CUHK (08/10/2010), Institute for Advanced Study Theoretical Computer Science/Discrete Mathematics Seminar (10/18/2010), FOCS (10/25/2010), Sublinear Algorithms workshop at Bertinoro, Italy (05/24/2011).
- "Optimal Testing of Reed-Muller Codes". IBM Almaden Research Center TOCTalk (06/14/10).
- "Lower Bounds for Testing Triangle-freeness in Boolean Functions". CSAIL Algorithms & Complexity Seminar (05/11/2009), Technion Theory Seminar (06/03/2009), Haifa University Theory Seminar (06/04/2009), INFORMS Annual Meeting at "Sublinear Algorithms" session (10/14/09).
- "Testing Linear-Invariant Non-Linear Properties". Schloss Dagstuhl, Leibniz Center for Informatics, Seminar on Sublinear Algorithms (19/08/2008), CSAIL Complexity Reading Group (10/06/2008), and IIT Kanpur Theory Seminar (01/27/2009).
- "Transitive-Closure Spanners". CSAIL Algorithms and Complexity Seminar (05/02/2008), SODA (01/06/2009), IBM T.J. Watson Research Center Seminar (11/22/2010).
- "The Direct Product Lemma, Hardness Amplification, and All That". CSAIL Crypto/Complexity Reading Group (12/01/2006).
- "Approximation Algorithms for Unique Games". CSAIL Theory of Computation Student Seminar (12/01/2005).

LANGUAGES

- Fluent in English, Bengali, Lisp and Java. Conversant in Hindi, French, C++ and Python.