

# Debajyoti Bera, PhD

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## Academic Interests

**Research & Education:** Complexity theory, Quantum computing, Algorithms in Data Engineering and Computer Networks, Theoretical aspects of Privacy & Security  
**Technology:** (Open-source) Software development and Computer Systems

## Education

### PhD in Computer Science (2010)

Boston University, Boston, USA

Dissertation: *Quantum circuits: Power and limitations* (Advisor: Prof. Steve Homer)

### B.Tech. in Computer Science and Engineering (May 2002)

Indian Institute of Technology (IIT), Kanpur, India

## Publications (Journal)

1. DEBAJYOTI BERA. Detection and diagnosis of single faults in quantum circuits in IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD) 2017. doi: 10.1109/TCAD.2017.2717783
2. Siddhartha Dawar, Vikram Goyal, DEBAJYOTI BERA. A hybrid framework for mining high-utility itemsets in a sparse transaction database in Applied Intelligence (2017). doi: 10.1007/s10489-017-0932-1
3. Khalique Newaz, K. Sriram, DEBAJYOTI BERA: Identification of Major Signaling Pathways in Prion Disease Progression Using Network Analysis, PLoS ONE 10(12): e0144389. doi: 10.1371/journal.pone.0144389 (2015)
4. DEBAJYOTI BERA: A different Deutsch-Jozsa. Quantum Information Processing (2015). doi:10.1007/s11128-015-0976-2
5. Flavio Esposito, Ibrahim Matta, DEBAJYOTI BERA, Pietro Michiardi: On the impact of seed scheduling in peer-to-peer networks. Computer Networks 55(15): 3303-3317 (2011)
6. DEBAJYOTI BERA: A lower bound method for quantum circuits. Information Processing Letters 111(15): 723-726 (2011)
7. DEBAJYOTI BERA, Stephen A. Fenner, Frederic Green, Steven Homer: Efficient universal quantum circuits. Quantum Information & Computation 10(1&2): 16-27 (2010)

## Publications (Conference & Workshop)

1. Meher Chaitanya, Debarshi Dutta, Kishore Kothapalli, DEBAJYOTI BERA. Applications of Graph Ear Decomposition to Efficient Heterogeneous Shortest Path/Cycle Problems in 19th Workshop on Advances in Parallel and Distributed Computational Models (IPDPS-APDCM) 2017.

2. Charudatt Pachorkar, Meher Chaitanya, Kishore Kothapalli, DEBAJYOTI BERA. Efficient Parallel Ear Decomposition of Graphs with Applications in 2016 IEEE 23rd International Conference on High Performance Computing (HiPC) 2016: 301-310. (**Best paper award**)
3. Jyoti Leeka, Srikanta Bedathur, DEBAJYOTI BERA, Medha Atre. Quark-X: An Efficient Top-K Processing Framework for RDF Quad Stores in 25th ACM International on Conference on Information and Knowledge Management (CIKM) 2016: 831-840.
4. DEBAJYOTI BERA, Rameshwar Pratap. Frequent-Itemset Mining using Locality-Sensitive Hashing in Computing and Combinatorics (COCOON). Lecture Notes in Computer Science, vol 9797. Springer, 2016: 143-155
5. Anuj S. Saxena, Vikram Goyal, DEBAJYOTI BERA. Mintra: Mining anonymized trajectories with annotations in 20th International Database Engineering & Applications Symposium (IDEAS) 2016: 105-114
6. Pankaj Sahu, Prachi Agrawal, Vikram Goyal, DEBAJYOTI BERA: Finding RkNN Set in Directed Graphs. In Distributed Computing and Internet Technology (ICDCIT). Lecture Notes in Computer Science, vol 8956. Springer, 2015: 162-173
7. Anuj Shanker Saxena, Vikram Goyal, DEBAJYOTI BERA: Efficient Enforcement of Privacy for Moving Object Trajectories In Information Systems Security (ICISS). Lecture Notes in Computer Science, vol 8303. Springer 2013: 360-374
8. Anuj Shanker Saxena, Mayank Pundir, Vikram Goyal, DEBAJYOTI BERA: Preserving Location Privacy for Continuous Queries on Known Route in Information Systems Security (ICISS). Lecture Notes in Computer Science, vol 7093. Springer 2011: 265-279
9. DEBAJYOTI BERA, Stephen A. Fenner, Frederic Green, Steven Homer: Efficient Universal Quantum Circuits in Computing and Combinatorics (COCOON). Lecture Notes in Computer Science, vol 5609. Springer 2009: 418-428

## Publications (Other)

1. Invited Article: DEBAJYOTI BERA, Frederic Green, Steve Homer. Small depth quantum circuits. ACM SIGACT News article, 38(2), June 2007
2. Monograph: Quantum Circuit Complexity: Low Depth Quantum Circuits: Power and Limitations. Lambert Academic Publishing

## Work and Teaching Experiences

1. Assistant Professor (tenure track), IIIT-Delhi, New Delhi, India. (*Since January 2010*)  
Courses taught: UG Algorithms, Advanced Algorithms, Randomised Algorithms, Graduate Algorithms, Theory of Computation, Complexity Theory, Introduction to Quantum Computing, P-vs-NP, Theory of Modern Cryptography
2. Software Developer, Adobe India Systems Pvt. Ltd. (*5 months in 2002*)
3. Software Development Internships at GMD-IPSI, VMWare Inc., ITA Software Inc., as B.Tech. & Ph.D. student

## MTech Thesis Students (Completed)

- Shubham Srivastava: Utility And Privacy Guarantees of Differential Privacy, 2016.
- Khalique Newaz: Network Analysis of Prion Disease, 2015.
- Siddharth Dawar: Privacy Preserving Reverse Spatial and Textual Nearest Neighbour Query, 2014
- Pankaj Sahu: Finding Top-k Influential Set in Directed Graphs, 2014.

## **Professional Activities**

- Member of Senate, IIIT-Delhi (2011-2013)
- External Expert for Curriculum Design, Examination Paper Moderation, etc. for Computer Science UG, PG and Ph.D. programs at Indira Gandhi National Open University, New Delhi.
- Referee for journal & conference submissions in computer science & quantum computing
- Faculty coordinator for various committees at IIIT-Delhi, including PhD Admissions, PhD (CSE) program, ERP, Website.