

David J. Rosenbaum

Department of Computer Science
Graduate School of Information Science and Technology
The University of Tokyo
185 Stevens Way
7-3-1 Hongo, Bunkyo-ku, Tokyo 113-8656, Japan

☎ 617-710-7126

✉ [dj7c4@gmail.com](mailto:djr7c4@gmail.com)

🌐 www.davidjrosenbaum.net

Curriculum Vitæ

Education

- 6/15 **PhD**, University of Washington, Computer Science & Engineering.
Thesis: Quantum computation and isomorphism testing
Advisors: Paul Beame and Aram Harrow
- 1/13–6/15 **Visiting Graduate Student**, Massachusetts Institute of Technology, Center
for Theoretical Physics.
- 6/12 **MS**, University of Washington, Computer Science & Engineering.
- 6/10 **BS**, *Summa Cum Laude*, Portland State University, Computer Science.
- 6/10 **BS**, *Summa Cum Laude*, Portland State University, Mathematics.

Academic employment

- 7/15–7/16 **Postdoctoral Fellow**, University of Tokyo, Department of Computer Science.

Awards

- 7/15–7/16 Japan Society for the Promotion of Science Postdoctoral Fellowship
- 4/14 Simons Award for Graduate Students in Theoretical Computer Science
- 4/11 National Defense Science and Engineering Graduate Fellowship
- 4/11 National Science Foundation Graduate Research Fellowship (declined)
- 6/10 Maseeh College of Engineering and Computer Science Commendation Award
- 5/09 Portland State University Department of Mathematics and Statistics Robert W.
Rempfer Endowed Scholarship
- 5/08 Young Researcher Award at the 38th International Symposium on Multiple
Valued Logic
- 4/06 Portland State University Maseeh College Dean's Scholarship

Research interests

Algorithms (both quantum and classical)

Isomorphism problems
Algebraic and group-theoretic problems
Quantum circuits
State preparation

Journal papers

- [1] David J. Rosenbaum and Fabian Wagner. Beating the generator-enumeration bound for p -group isomorphism. *Theoretical Computer Science*, 593:16–25, 2015, arXiv:1312.1755.
- [2] Aram W. Harrow and David J. Rosenbaum. Uselessness for an oracle model with internal randomness. *Quantum Information and Computation*, 14(7&8), May 2014, arXiv:1111.1462.
- [3] David J. Rosenbaum. Binary superposed quantum decision diagrams. *Quantum Information Processing*, 9:463–496, August 2010.
- [4] David J. Rosenbaum and Marek A. Perkowski. Extended superposed quantum state initialization using disjoint prime implicants. *Physical Review A*, 79(5):052310, May 2009.

Conference papers

- [5] David J. Rosenbaum. Optimal quantum circuits for nearest-neighbor architectures. In *Eighth Conference on the Theory of Quantum Computation, Communication and Cryptography*, volume 22, pages 294–307, May 2013, arXiv:1205.0036.
- [6] David J. Rosenbaum. Breaking the $n^{\log n}$ barrier for solvable-group isomorphism. In *Proceedings of the Twenty-Fourth Annual ACM-SIAM Symposium on Discrete Algorithms*, pages 1054–1073, January 2013, arXiv:1205.0642.
- [7] David J. Rosenbaum and Marek A. Perkowski. Mapping binary functions to a practical adiabatic quantum computer. In *Proceedings of the 40th International Symposium on Multiple Valued Logic*, pages 270–275, May 2010.
- [8] David J. Rosenbaum and Marek A. Perkowski. Efficient implementation of controlled operations for multivalued quantum logic. In *Proceedings of the 39th International Symposium on Multiple Valued Logic*, pages 86–91, May 2009.
- [9] David J. Rosenbaum and Marek A. Perkowski. Superposed quantum state initialization using disjoint prime implicants. In *Proceedings of the 38th International Symposium on Multiple Valued Logic*, pages 144–149, May 2008.

Preprints

- [10] Aram W. Harrow and David J. Rosenbaum. Permutations in 2D quantum circuits. 2015. In preparation.
- [11] François Le Gall and David J. Rosenbaum. On the group and color isomorphism problems. 2015. Submitted to the Conference on Computational Complexity.
- [12] David J. Rosenbaum. Beating the generator-enumeration bound for solvable-group isomorphism. December 2014, arXiv:1412.0639. Submitted to ACM Transactions on Computation Theory.

- [13] David J. Rosenbaum. Bidirectional collision detection and faster deterministic isomorphism testing. April 2013, arXiv:1304.3935. Submitted to Theoretical Computer Science.
- [14] David J. Rosenbaum. Quantum algorithms for tree isomorphism and state symmetrization. August 2010, arXiv:1011.4138.

Invited and conference talks

- 6/14 Bidirectional Collision Detection and Faster Algorithms for Group Isomorphism, GCG 2014
- 5/13 Optimal Quantum Circuits for Nearest-Neighbor Architectures, TQC 2013
- 3/13 Bidirectional Collision Detection and Faster Deterministic Isomorphism Testing, Massachusetts Institute of Technology, PUMAGRASS.
- 1/13 Breaking the $n^{\log n}$ Barrier for Solvable-Group Isomorphism, SODA 2013
- 12/12 Breaking the $n^{\log n}$ Barrier for Solvable-Group Isomorphism, University of Washington, Combinatorics Seminar.
- 8/12 Breaking the $n^{\log n}$ Barrier for Solvable-Group Isomorphism, University of Waterloo, IQC.
- 5/08 Mapping Binary Functions to a Practical Adiabatic Quantum Computer, ISMVL 2010.
- 5/08 Superposed Quantum State Initialization Using Disjoint Prime Implicants (SQUID), ISMVL 2008.

Professional activities

Reviewing

Quantum Information Processing (QIP)
 Computational Complexity Conference (CCC)
 International Symposium on Algorithms and Computation (ISAAC)
 Scandinavian Symposium and Workshops on Algorithm Theory
 Theory of Computing
 SIAM Journal on Computing
 ACM Transactions on Computers
 Quantum Information & Computation
 Journal of Quantum Information Processing