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## Luis Alexis Rademacher

**Interests:** Algorithms, geometry, complexity theory, matrix approximation, game theory, mathematical economics, optimization.

### Education:

- PhD. in Applied Mathematics, *Massachusetts Institute of Technology*. Advisor: Santosh Vempala (2002–2007)
- Civil Engineer, major in Mathematics, maximum distinction. *University of Chile*, Santiago, Chile. (1996–2002)
- Bachelor in Engineering Sciences, major in Mathematics, maximum distinction. *University of Chile*, Santiago, Chile. (1996–2001)
- Parallel programming course, Silicon Graphics Inc. (1997)

### Publications:

*In preparation/submitted:*

- *Minimal Partitioning into Product Sets*. With Xuancheng Shao.

*Published in peer-reviewed conference proceedings:*

- *Approximating the Centroid is Hard*. In SOCG 2007.
- *Dispersion of Mass and the Complexity of Randomized Geometric Algorithms*. In FOCS 2006, with Santosh Vempala.
- *Computing Equilibrium Prices in Exchange Economies with Tax Distortions*. In ICALP 2006, with Bruno Codenotti and Kasturi Varadarajan.
- *Matrix Approximation and Projective Clustering via Volume Sampling*. In SODA 2006, with Amit Deshpande, Grant Wang and Santosh Vempala.
- *Testing Geometric Convexity*. In FSTTCS 2004, with Santosh Vempala.

*Published in peer-reviewed journals:*

- *Dispersion of Mass and the Complexity of Randomized Geometric Algorithms*. To appear in *Advances in Mathematics*, with Santosh Vempala.
- *Matrix Approximation and Projective Clustering via Volume Sampling*. In *Theory of Computing* v. 2 n. 12 (2006), with Amit Deshpande, Grant Wang and Santosh Vempala.

### Internships and other research experiences:

*At Toyota Technological Institute - Chicago:*

- Computation of market equilibria with taxation, with Bruno Codenotti (paper published). (2005)

*At Department of Mathematical Engineering, University of Chile:*

- Computation and Stability of Nash Equilibria and Applications to the Modeling of the Electrical Energy Generation Market. Mathematical Engineering thesis work, directed by Alejandro Jofré. (2001–2002)

- Computation and Visualization of Walras and Nash Equilibria. Preprofessional work directed by Alejandro Jofré. (2000)
- Computation of Dynamical Properties of Prefix-code Cellular Automata. Preprofessional work directed by Alejandro Maass. (1999)
- Parallel Simulation of Cellular Automata. Directed by Eric Goles. (1997–1998)

**Distinctions:**

- “Johnson Prize” from MIT Department of Mathematics for an outstanding research paper published by a graduate student (2007).
- “Marcos Orrego Puelma Award” from the Institute of Engineers of Chile, for the best engineering student graduated from University of Chile during 2002. (2003)
- Liberty Mutual Insurance Company/Boston Foundation Fellowship. (2002-2003)
- “Academic Excellence Fellowship” at University of Chile. Full college tuition due to outstanding grades. (1996–1998)
- “Outstanding student”; 5% of the students of the Faculty of Physical and Mathematical Sciences at University of Chile are selected in this category each year. (1996–1998)
- First Place, National Olympiad of the Knowledge of Chemistry, Chile. (1995)
- Second Place, National Olympiad of Chemistry, Chile. (1994)
- First Place, National Olympiad of Chemistry, Chile. (1993)

**Invited Talks:**

- Matrix Approximation and Projective Clustering via Volume Sampling. Toyota Technological Institute at Chicago. 2005.
- Matrix Approximation and Projective Clustering via Volume Sampling. IBM T. J. Watson Research Center, Yorktown. 2005.
- Dispersion of Mass and the Complexity of Randomized Algorithms. Yale Discrete Mathematics and Theoretical Computer Science Seminar. 2006.
- Dispersion of Mass and the Complexity of Randomized Geometric Algorithms. Georgia Institute of Technology, Mathematics Department, Combinatorics Seminar. 2006.
- Dispersion of Mass and Lower Bounds for Randomized Algorithms. GaTech-DIMACS Workshop on Phase Transitions in Random Structures and Algorithms. 2007.
- Dispersion of Mass and the Complexity of Randomized Algorithms. Geometry and Algorithms. Heriot-Watt University, Edinburgh. 2007.

**Teaching and Mentoring Experience:**

- Mentor for the Summer Program in Undergraduate Research, MIT. 2007.
- Teaching assistant in calculus, multivariable calculus, ODE (University of Chile), statistics, combinatorial optimization and probability theory (MIT).

**Computational Experience:** Mathematica, Matlab, C, C++, Java, parallel computing.

**Languages:** Spanish (native), English (fluent), German (conversant).

**References:** available upon request.