

**Eden Chlamtáč**

Curriculum Vitae

Tel Aviv University  
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## EMPLOYMENT AND EDUCATION

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<b>Tel Aviv University</b> Postdoctoral Fellow	2011–
<b>University of Toronto</b> Postdoctoral Fellow	Fall Semester, 2010
<b>Weizmann Institute of Science</b> Postdoctoral Fellow	2008–2010
<b>Princeton University</b> <b>Ph.D. in Computer Science</b> <i>Advisor:</i> Prof. Sanjeev Arora <i>Thesis Topic:</i> Non-Local Analysis of SDP-Based Approximation Algorithms	2003–2008
<b>Weizmann Institute of Science</b> <b>MSc in Computer Science</b> <i>Advisor:</i> Prof. Uriel Feige <i>Thesis Topic:</i> Cover Times of Random Walks and Markov Chains	2000–2003
<b>Tel Aviv University</b> <b>BS in Mathematics and Computer Science</b>	1997–2000

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## RESEARCH INTERESTS

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- Approximation Algorithms
- Convex Optimization

My main area of interest is in designing and analyzing approximation algorithms for well-studied combinatorial optimization problems, such as Graph Coloring, Sparsest Cut and Unique Games. Many of these algorithms rely on convex optimization tools, such as Linear Programming (LP) and Semidefinite Programming (SDP). In particular, a number of my results make novel use of hierarchies of LP or SDP relaxations. Previous work on hierarchies had focused on negative results, and prior to my work, no improvements in approximation algorithms relied on hierarchies.

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## HONORS

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- **Recipient of Sir Charles Clore Postdoctoral Fellowship** 2008-2010
- **Recipient of Francis Upton Fellowship** 2003-2007
- **Graduated Magna Cum Laude from Tel Aviv University** 2002
- **Dean's List For Academic Achievement (Tel Aviv University)** 1997/1998, 1999/2000

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## PUBLICATIONS

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- *Manuscript:* **Understanding Set Cover: Sub-exponential Time Approximations and Lift-and-Project Methods** (with Zac Friggstad and Konstantinos Georgiou).
- *Submitted:* **Everywhere-Sparse Spanners via Dense Subgraphs** (with Michael Dinitz and Robert Krauthgamer).
- **Linear Index Coding Via Semidefinite Programming** (with Ishay Haviv), to appear in Twenty-Third Annual Symposium on Discrete Algorithms (SODA) 2012.
- **Inapproximability of NP-Complete Variants of Nash Equilibrium** (with Per Austrin and Mark Braverman), Proceedings of 14th International Workshop on Approximation Algorithms for Combinatorial Optimization Problems (APPROX) 2011.
- **Approximating Sparsest Cut in Graphs of Bounded Treewidth** (with Robert Krauthgamer and Prasad Raghavendra), Proceedings of 13th International Workshop on Approximation Algorithms for Combinatorial Optimization Problems (APPROX) 2010.
- **Detecting High Log-Densities - an  $O(n^{1/4})$  Approximation for Densest  $k$ -Subgraph** (with Aditya Bhaskara, Moses Charikar, Uriel Feige and Aravindan Vijayaraghavan), Proceedings of 42nd Symposium on Theory of Computing (STOC) 2010.
- **Efficient Traversal of Mesh Edges using Adjacency Primitives** (with Pedro V. Sander, Diego Nehab and Hugues Hoppe), Proceedings of 1st ACM SIGGRAPH Conference and Exhibition in Asia (SIGGRAPH Asia) 2008.
- **Improved Approximation Guarantees Through Higher Levels of SDP Hierarchies** (with Gyanit Singh), Proceedings of 11th International Workshop on Approximation Algorithms for Combinatorial Optimization Problems (APPROX) 2008.
- **Approximation Algorithms Using Hierarchies of Semidefinite Programming Relaxations**, Proceedings of 48th Symposium on Foundations of Computer Science (FOCS) 2007.
- **How to Play Unique Games Using Embeddings** (with Konstantin Makarychev and Yury Makarychev), Proceedings of 47th Symposium on Foundations of Computer Science (FOCS) 2006.
- **New Approximation Guarantee for Chromatic Number** (with Sanjeev Arora and Moses Charikar), Proceedings of 38th Symposium on Theory of Computing (STOC) 2006.

- **Improved Approximation of the Minimum Cover Time** (with Uriel Feige), *Theoretical Computer Science*, Volume 341, Issue 1, Pages 22–38, 2005.

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## BOOK CHAPTER

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- **Convex Relaxations and Integrality Gaps** (with Madhur Tulsiani), in the Springer *Handbook on Semidefinite, Conic and Polynomial Optimization*.

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## INVITED TALKS

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- **INFORMS Annual Meeting, Pittsburgh, PA** November 2006  
Invited talk on *New Approximation Guarantee for Chromatic Number*
- **Joint ALADDIN/Theory/OR Seminar, Carnegie Mellon University** November 2006  
Invited talk on *New Approximation Guarantee for Chromatic Number*
- **CSE Theory Seminar, University of Washington** November 2006  
Invited talk on *New Approximation Guarantee for Chromatic Number*
- **China Theory Week, ICST, Tsinghua University, China** September 2007  
Invited talk on *Coloring, Independent Sets and SDP Hierarchies*
- **IP Seminar, IBM T.J. Watson Research Center** October 2007  
Invited talk on *Coloring, Independent Sets and SDP Hierarchies*
- **NYU/Courant Theory Seminar** December 2007  
Invited talk on *Coloring, Independent Sets and SDP Hierarchies*
- **CS Theory Seminar, University of Toronto** November 2007  
Invited talk on *Coloring, Independent Sets and SDP Hierarchies*
- **ARC Colloquium, Georgia Tech** December 2007  
Invited talk on *Coloring, Independent Sets and SDP Hierarchies*
- **10th International Workshop on High Performance Optimization Techniques (HPOPT)** June 2008  
Invited talk on *Coloring, Independent Sets and SDP Hierarchies*
- **Foundations of Computer Science Seminar, Weizmann Institute** January 2009  
Invited talk on *Using SDP Hierarchies for Approximation Algorithms*
- **CS Theory Seminar, Tel Aviv University** March 2009  
Invited talk on *Using SDP Hierarchies for Approximation Algorithms*
- **CS Theory Seminar, Hebrew University** May 2009  
Invited talk on *Using SDP Hierarchies for Approximation Algorithms*
- **Foundations of Computer Science Seminar, Weizmann Institute** November 2009  
Invited talk on *New Approximation Algorithms for Densest  $k$ -Subgraph*

- **IBM Haifa Research Seminar** January 2010  
Invited talk on *Approximate Densest  $k$ -Subgraph: Average-Case Techniques for Worst-Case Algorithms*
- **CS Theory Seminar, University of Toronto** February 2010  
Invited talk on *New Approximation Algorithms for Densest  $k$ -Subgraph*
- **CS Theory Seminar, Tel Aviv University** March 2010  
Invited talk on *New Approximation Algorithms for Densest  $k$ -Subgraph*
- **CS Theory Seminar, Hebrew University** May 2010  
Invited talk on *New Approximation Algorithms for Densest  $k$ -Subgraph*
- **IP Seminar, IBM T.J. Watson Research Center** June 2010  
Invited talk on *Approximating Sparsest Cut in Graphs of Bounded Treewidth*
- **Foundations of Computer Science Seminar, Weizmann Institute** July 2010  
Invited talk on *Approximating Sparsest Cut in Graphs of Bounded Treewidth*
- **Theory Lunch Seminar, Princeton University** October 2010  
Invited talk on *Approximating Sparsest Cut in Graphs of Bounded Treewidth*
- **CS Theory Seminar, Brown University** October 2010  
Invited talk on *Approximating Sparsest Cut in Graphs of Bounded Treewidth*
- **CS Theory Seminar, University of Toronto** October 2010  
Invited talk on *Approximating Sparsest Cut in Graphs of Bounded Treewidth*
- **Combinatoris Seminar, Tel Aviv University** March 2011  
Invited talk on *Inapproximability of NP-Complete variants of Nash equilibrium*
- **11th Haifa Workshop on Applications of Graph Theory, Combinatorics and Algorithms, CRI, University of Haifa** May 2011  
Invited talk on *Approximating Sparsest Cut in Graphs of Bounded Treewidth*
- **CS Theory Seminar, Technion, Israel** May 2011  
Invited talk on *Linear Index Coding via Semidefinite Programming*
- **Seminar on Design and Analysis of Randomized and Approximation Algorithms, Dagstuhl** June 2011  
Invited talk on *Linear Index Coding via Semidefinite Programming*
- **Theory Group Seminar, Free University Berlin** June 2011  
Invited talk on *Approximating Sparsest Cut in Graphs of Bounded Treewidth*
- **CS Theory Seminar, Ben Gurion University** June 2011  
Invited talk on *Linear Index Coding via Semidefinite Programming*
- **Center for Computational Intractability meeting, Princeton University** September 2011  
Invited talk on *Bounding 2-Spanner Degrees by Finding Dense Subgraphs*
- **IP Seminar, IBM T.J. Watson Research Center** September 2011  
Invited talk on *Sparse Spanners via Dense Subgraphs*
- **CS Theory Seminar, University of Toronto** October 2011  
Invited talk on *Sparse Spanners via Dense Subgraphs*

- **Tutte Seminar, University of Waterloo** October 2011  
Invited talk on *Sparse Spanners via Dense Subgraphs*

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## TEACHING EXPERIENCE

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- **Computer Science Department, Princeton University, NJ** Spring 2005  
Teaching Assistant for COS 226: *Algorithms and Data Structures*
- **Computer Science Department, Princeton University, NJ** Fall 2004  
Teaching Assistant for COS 126: *General Computer Science*
- **Faculty of Mathematics and Computer Science, Weizmann Institute of Science, Rehovot, Israel** Fall 2001, Spring 2002  
Teaching Assistant for *Algorithms and Their Complexity*
- **School of Computer Science, Tel Aviv University, Tel Aviv, Israel** Spring 2000  
Teaching Assistant for *Discrete Mathematics*
- **School of Computer Science, Tel Aviv University, Tel Aviv, Israel** Fall 1999  
Teaching Assistant for *Extended Introduction to Computer Science (using SCHEME)*

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## PROGRAMMING LANGUAGES

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C, C++, Java