

# Avinatan Hassidim

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Date of birth: November 3rd, 1981.

RESEARCH INTERESTS     Quantum Computation, Mechanism Design.

EMPLOYMENT     ◇ **Senior Lecturer, Department of Computer Science, Bar Ilan University**(2011 - current)

◇ **Google** (2010 )

◇ **MIT**, Keck postdoctoral Fellow (2008 - 2010)

◇ **Microsoft Research**, Consultant (2009 - 2010)

EDUCATION     ◇ **Hebrew University**, Jerusalem, Israel (2004 - 2008)  
PhD from the School of Computer Science and Engineering.  
Advisor: Prof. Michael Ben-Or. Done in parallel to army service.

◇ **Hebrew University**, Jerusalem, Israel (2002)

MSc degree in Computer Science.

Advisor: Prof. Eliezer Lozinski (summa cum laude)

◇ **Hebrew University**, Jerusalem, Israel (2000 - 2002)

BSc degree in Computer Science, Math and Physics (summa cum laude).

MILITARY SERVICE     ◇ **Talpiot** (1999 - 2002)  
Cadet in a special military program, designed to train leading researchers.

◇ **Algorithmic Research** (2002 - 2008)

Head of a research section. Ranked Captain.

HONORS     ◇ Runner up for best paper award, Infocom 2013.  
◇ Runner up for best paper award, Infocom 2012.  
◇ Best paper award Sigmetrics 2011.  
◇ CTO and VP R&D of MeterLive, winner of the Telecom Track in MIT 100K competition, 2008. Total prize money 22,000\$.  
◇ MIT Keck postdoctoral Fellowship 2008-2010.  
◇ **Israel's Chief of Staff prize for outstanding officer of the year 2006.**  
◇ Hebrew university's rector's prize for academic year 2002.  
◇ Hebrew university's rector's prize for academic year 2001.  
◇ Faculty of sciences' dean's prize for academic year 2000.

PROFESSIONAL SERVICE     PC of RANDOM-09, STOC13, SODA15, EC15.

◇ Reviewer for PRL, IPL, SICOMP, FOCS, ICS, STOC, SODA, PODC, PRA, Phys-Rev-B, QIP, RANDOM, ESA, QIC, SPAA.

*Avinatan Hassidim*

- OTHER  
QUALIFICATIONS
- ◇ Experience with cellular networks.
  - ◇ C++, Python, Java.
- GRANTS  
AWARDED
- ◇ Milgrom fund for military medicine 2014 - 2015, with Amir Gliberson and Ayal Hassidim "Prescreening of Soldiers to Identify Depression", 57,000\$.
  - ◇ MAFAAT (via the medical corpse, IDF) 2014 - 2015, "Using Cellular Phones for Hearing Tests in the Field", 172,000 NIS.
  - ◇ Bilateral Science Fund (BSF), 2014-2015, with Itai Ashlagi and Mark Braverman, "Designing Simple Mechanisms for Complicated Markets", 75,000\$.
  - ◇ German Israel Foundation (GIF), 2012, "Post Quantum Cryptography", 22,000 Euro.
  - ◇ Israel Academy of Science and Humanities (ISF), 2012 - 2016, "Algorithmic Aspects of Markets", 700,000 NIS.
  - ◇ Magnetron, 2011-2012, with Sarit Kraus, 430,000 NIS
- CURRENT  
STUDENTS
- ◇ Slavan Bronfman, studying for MSc. Started at 2012. Topic - Redesign of the Internship market in Israel.
  - ◇ Chen Hajaj, studying for Phd. Started at 2013. Topic Matching Platforms. Joint with Dudi Sarne.
  - ◇ Erel Segal, studying for Phd. Started at 2013. Topic: Fair Division of Land. Joint with Yonatan Aumann.
  - ◇ Orgad Keller, studying for Phd. Started at 2012. Topic: Graph Distance Variants and their relation to Fast Matrix Multiplication and Determinant Computation. Joint With moshe Lewenstein and Liam Roditty.
- PAST  
STUDENTS
- ◇ Israel Sofer, Msc. 2012-2014, Thesis title: Negotiation in Exploration-Based Environment. Joint with Dudi Sarne
  - ◇ Omri Tuval. Msc. 2005-2012. Thesis title Joint Cache Partition and Job Assignment on Multi-Core Processors: joint with Haim Kaplan.

## Publications - Avinatan Hassidim

### Journal Publications

1. Avinatan Hassidim, Haim Kaplan, Yishay Mansour, Noam Nisan: The AND-OR Game: Equilibrium Characterization. Minor revision TEAC.
2. Ori Rottenstreich, Isaac Keslassy, Avinatan Hassidim, Haim Kaplan, Ely Porat. On Finding an Optimal Guaranteed-TCAM Encoding Scheme for Packet Classification, Accepted to Transactions on Networking.
3. Miklos Ajtai, Vitaly Feldman, Avinatan Hassidim, Jelani Nelson: Sorting and Selection with Imprecise Comparisons. Accepted Transactions on Algorithms (TALG)
4. Slava Bronfman, Avinatan Hassidim, Arnon Afek, Assaf Romm, Roni Shreberk, Ayal Hassidim, Anda Massler: Assigning Israeli medical graduates to internships. Accepted to Israeli Journal of Public Health Research.
5. Avinatan Hassidim, Yishay Mansour, Shai Vardi. Local computation mechanism design. Invited to TEAC
6. Yonatan Aumann, Yair Domb, Avinatan Hassidim. Auctioning Time: Truthful Auctions of Heterogeneous Divisible Goods. Accepted to TEAC.
7. Quantum Multiprover Interactive Proofs with Communicating Provers. Michael Ben-Or, Avinatan Hassidim and Haran Pilpel. SIAM J. Comput. 43(3): 987-1011 (2014).
8. Probe scheduling for efficient detection of silent failures, Edith Cohen, Avinatan Hassidim, Haim Kaplan, Yishay Mansour, Danny Raz and Yoav Tzur Perform. Eval. 79: 73-89 (2014)
9. Matching with Couples Revisited, Itai Ashlaghi, Mark Braverman and Avinatan Hassidim, Operations Research 62(4): 713-732 (2014).
10. Compressing Forwarding Tables for Datacenter Scalability, O. Rottenstreich, M. Radan, Y. Cassuto, I. Keslassy, C. Arad, T. Mizrahi, Y. Revah, and A. Hassidim. IEEE Journal on Selected Areas in Communications 32(1): 138-151 (2014).
11. Topology discovery of sparse random graphs with few participants, Animashree Anandkumar, Avinatan Hassidim, Jonathan A. Kelner, Random Struct. Algorithms 43(1): 16-48 (2013)
12. Quantum money, Aaronson, S. and Farhi, E. and Gosset, D. and Hassidim, A. and Kelner, J. and Lutomirski, A. Communications of the ACM volume 55, number 8, pages 84-92, 2012.
13. Global alignment of molecular sequences via ancestral state reconstruction, Andoni, A. and Daskalakis, C. and Hassidim, A. and Roch, S, Stochastic Processes and their Applications, 2012
14. Monotonicity and Implementability. Itai Ashlagi, Mark Braverman, Avinatan Hassidim and Dov Monderer. **Econometrica** September 2010, pages 1749-1772.
15. Quantum State Restoration and Single-Copy Tomography for Ground States of Hamiltonians. Eddie Farhi, David Gosset, Avinatan Hassidim, Andy Lutomirski Daniel Nagaj and Peter Shor. [arxiv:0912.3823] PRL (Physical Review Letters), 2011 volume 105, number 19, pages 190503-190507.

16. Quantum algorithms for testing properties of distributions. Sergey Bravyev, Aram Harrow, Avinatan Hassidim. **IEEE Transactions on Information Theory** June 2011, pages 3971—3981.
17. Adaptive versus non-adaptive strategies for quantum channel discrimination. Aram W. Harrow, Avinatan Hassidim, Debbie W. Leung and John Watrous. *Physical Review A*, **PRA**, pages 032339 — 032345, 2010.
18. Position Auctions with Budgets: Existence and Uniqueness. Itai Ashlagi, Mark Braverman, Avinatan Hassidim, Ron Lavi and Moshe Tennenholtz. *BE journal of theoretical economics, advances tier (top tier)*. Volume 10, Issue 1, Article 20.
19. Quantum Algorithm for Linear Systems of Equations. Aram Harrow, Avinatan Hassidim, Seth Lloyd. Editor’s suggestion of *Physical Review Letters (PRL)*, vol. 15, no. 103, pp. 150502. Invited talk at QIP 2010. Selected to the October 2009 issue of *The Virtual Journal of Quantum Information*. [arXiv:0811.3171]
20. No Nonlocal Box is Universal. Frédéric Dupuis, Nicolas Gisin, Avinatan Hassidim, André Allan Méthot, Haran Pilpel. *Journal of Mathematical Physics* **JMP** 48, 082107. [arxiv:0701.142]. Selected to the September 2007 issue of *The Virtual Journal of Quantum Information*.

## Refereed Conference Publications

1. Erel Segal-Halevi, Avinatan Hassidim, Yonatan Aumann: Waste Makes Haste: Bounded Time Protocols for Envy-Free Cake Cutting with Free Disposal AAMAS 2015.
2. Sigal Sina, Noam Hazon, Avinatan Hassidim, Sarit Kraus: Adapting the Social Network to Affect Elections, AAMAS 2015
3. Erel Segal-Halevi, Avinatan Hassidim, Yonatan Aumann: Envy-Free Cake-Cutting in Two Dimensions, accepted to AAAI 2015.
4. Chen Hajaj, Jon John Dickerson, Avinatan Hassidim, Tuomas Sandholm, David Sarne: Strategy-Proof and Efficient Kidney Exchange Using a Credit Mechanism, accepted to AAAI 2015.
5. Avinatan Hassidim, Yishay Mansour, Shai Vardi: Local computation mechanism design. EC 2014: 601-616
6. Yonatan Aumann, Yair Dombb, Avinatan Hassidim: Auctioning a cake: truthful auctions of heterogeneous divisible goods. AAMAS 2014: 1045-1052
7. Ori Rottenstreich, Isaac Keslassy, Avinatan Hassidim, Haim Kaplan, Ely Porat: On finding an optimal TCAM encoding scheme for packet classification. **Runner up for best paper award INFOCOM 2013: 2049-2057**
8. Yonatan Aumann, Yair Dombb, Avinatan Hassidim: Computing socially-efficient cake divisions. AAMAS 2013: 343-350
9. Ori Rottenstreich, Marat Radan, Yuval Cassuto, Isaac Keslassy, Carmi Arad, Tal Mizrahi, Yoram Revah, Avinatan Hassidim: Compressing forwarding tables. INFOCOM 2013: 1231-1239
10. Avinatan Hassidim, Danny Raz, Michal Segalov, Ariel Shaqed: Network utilization: The flow view. INFOCOM 2013: 1429-1437
11. Amos Azaria, Avinatan Hassidim, Sarit Kraus, Adi Eshkol, Ofer Weintraub, Irit Natanely: Movie recommender system for profit maximization. RecSys 2013: 121-128

12. Avinatan Hassidim, Haim Kaplan, Omry Tuval: Joint Cache Partition and Job Assignment on Multi-core Processors. WADS 2013: 378-389
13. Avinatan Hassidim, Orgad Keller, Moshe Lewenstein, Liam Roditty: Finding the Minimum-Weight k-Path. WADS 2013: 390-401
14. James Cook, Alex Fabrikant, Avinatan Hassidim: How to grow more pairs: suggesting review targets for comparison-friendly review ecosystems. WWW 2013: 237-248
15. Michael Ben-Or, Daniel Gottesman and Avinatan Hassidim Quantum Computation Without Introducing Fresh Qubits QIP 2012.
16. Emilie Danna, Avinatan Hassidim, Haim Kaplan, Alok Kumar, Yishay Mansour, Danny Raz and Michal Segalov, Upwards max min fairness, **Runner up for best paper award INFOCOM** 2012.
17. Tzvika Hartman, Avinatan Hassidim, Haim Kaplan, Danny Raz and Michal Segalov, How to split a flow, **INFOCOM** 2012.
18. Sofer, I. and Sarne, D. and Hassidim, A., Negotiation in exploration-based environment, AAI 2012.
19. Eddie Farhi, David Gosset, Avinatan Hassidim, Andy Lutomirski and Peter Shor, Quantum money based on knot theory. Innovations in Theoretical Computer Science (**ITCS**) 2012.
20. Bohua Zhan, Shelby Kimmel and Avinatan Hassidim, Super-Polynomial Quantum Speed-ups for Boolean Evaluation Trees with Hidden Structure. Innovations in Theoretical Computer Science (**ITCS**) 2012.
21. Avinatan Hassidim, Haim Kaplan, Yishay Mansour, Noam Nisan: The AND-OR Game: Equilibrium Characterization - (Working Paper). WINE 2012: 561
22. Animashree Anandkumar, Avinatan Hassidim and Jon Kelner, Network Topology Estimation via Phylogenetic Reconstruction. **best paper award Sigmetrics** 2011, pages 293-304.
23. Avinatan Hassidim, Haim Kaplan, Yishay Mansour, Noam Nisan, Non-Price Equilibria in Markets of Discrete Goods. ACM conference on Electronic Markets **EC** 2011, pages 295-296.
24. Itai Ashlaghi, Mark Braverman and Avinatan Hassidim, Matching with Couples Revisited. ACM conference on Electronic Markets **EC** 2011, pages 335-336.
25. Mark Braverman, Avinatan Hassidim and Yael Tauman Kalai, Leaky Pseudo-Entropy Functions. Innovations in Computer Science (**ICS**) 2011, pages 353-366.
26. Alan Edelman Avinatan Hassidim, Huy N. Nguyen and Krzysztof Onak, An Efficient Partitioning Oracle for Bounded Treewidth. **RANDOM**, 2011 , pages 530-541.
27. Caching for Multicore Machines. Avinatan Hassidim. Innovations in Computer Science (**ICS**) 2010, Pages 501-509.
28. Trace Reconstruction on a Tree. Alexander Andoni, Constantinos Daskalakis, Avinatan Hassidim, Sebastien Roch. Innovations in Computer Science (**ICS**) 2010, pages 358-369.
29. Making and Breaking Quantum Money. Andrew Lutomirski, Scott Aaronson, Eddie Farhi, David Gosset, Jon Kelner, Avinatan Hassidim and Peter Shor. Innovations in Computer Science (**ICS**) 2010, pages 20-31.

30. Derandomizing Algorithms on Product Distributions. Ariel Gabizon and Avinatan Hassidim. *Innovations in Computer Science (ICS)* 2010, pages 397-405.
31. Perfect Revenue From Perfectly Informed Players. Jing Chen, Avinatan Hassidim and Silvio Micali. *ICS* 2010, pages 94-105. Invited to *Recent Developments in Mechanism Design*, 2010.
32. Quantum algorithms for testing properties of distributions. Sergey Bravey, Aram Harrow, Avinatan Hassidim. *STACS* 2010, pages 131-142. Subsidized by the journal version.
33. Local Graph Partitions for Approximation and Testing. Avinatan Hassidim, Jonathan Kelner, Huy N. Nguyen and Krzysztof Onak. *FOCS* 2009, pages 22-31.
34. Sorting and Selection with Imprecise Comparisons. Miklós Ajtai, Vitaly Feldman, Avinatan Hassidim and Jelani Nelson. *ICALP* 2009, pages 37-48.
35. Quantum Multiprover Interactive Proofs with Communicating Provers. Michael Ben-Or, Avinatan Hassidim and Haran Pilpel. **Invited talk at QIP 2009**. *FOCS* 2008, pages 467-476.
36. The Bayesian Learner is Optimal for Noisy Binary Search (and pretty good for quantum as well). Michael Ben-Or and Avinatan Hassidim. [arxiv:0703.231]. *QIP* 2006. *FOCS* 2008, pages 221-230.
37. Broadcasting with Side Information. Noga Alon, Eyal Lubetzky, Uri Stav, Amit Weinstein Avinatan Hassidim. *FOCS* 2008, pages 823-832.
38. Secure Multiparty Quantum Computation with (Only) a Strict Honest Majority. Michael Ben-Or, Claude Crépeau, Daniel Gottesman, Avinatan Hassidim and Adam Smith. *QIP* 2006. *FOCS* 2006, pages 249-260.
39. Fast Quantum Byzantine Agreement. Michael Ben-Or and Avinatan Hassidim. *STOC* 2005, pages 481-485.

## Work in progress

1. Chen Hajaj, Avinatan Hassidim and David Sarne, Incentive Compatible Algorithms for Kidney Exchange Clearinghouses
2. Avinatan Hassidim, Haim Kaplan and Michael Schapira, How to Choose Terminals in Multi-commodity Flow.
3. Shoshana Vasserman, Michal Feldman, Avinatan Hassidim, Implementing the Wisdom of Waze
4. Erel Segal-Halevi, Avinatan Hassidim, Yonatan Aumann, Envy-Free Cake-Cutting in Two Dimensions
5. Itai Ashlagi, Mark Braverman and Avinatan Hassidim. Unit Demand Auctions with Budget Constraints.
6. Alex Andoni, Mark Braverman and Avinatan Hassidim. Phylogenetic Reconstruction with Insertions and Deletions.

*Avinatan Hassidim*

- SERVICE TO  
THE  
COMMUNITY
- ◇ Counselor for second year students
  - ◇ Responsible for intro to CS. Redesigned the course.
  - ◇ Designed the Israeli Psychology Match, used to assign students in master programs (including clinical psychology) to institutions
  - ◇ Redesigned the internship lottery, which assigns Israeli doctors to internship programs
  - ◇ Designed school choice mechanisms in five cities. Working with the ministry of education to do school choice in Israel.
- INVITED  
TALKS AND  
PRESENTA-  
TION
- ◇ 12th Workshop on Quantum Information Processing (QIP 2009)
  - ◇ Dagstuhl Seminar: 11381 Quantum Cryptanalysis 2011
  - ◇ Google's International Ad Auctions Workshop 2011
  - ◇ Dagstuhl Seminar: 13461 Electronic Markets and Auctions 2013
  - ◇ In addition I gave presentations (theory seminar or colloquium) at MIT, Stanford, Berkeley, Princeton, Weizmann, Hebrew University, Tel Aviv University, Bar Ilan University, IDC, Ben Gurion University and at various occasions at Google.