CURRICULUM VITAE AND LIST OF PUBLICATIONS

Personal Details

Name: Chen Avin

Date and place of birth: 08/07/1970, Israel.

Regular military service (dates): From 07/11/1989 to 06/11/1992.

Address and telephone number at work: School of Electrical and Computer Engineering, Ben-Gurion University of the Negev, Beer-Sheva 84105, Israel, Tel: 08-6428071, Fax: 08-6472883, Email: avin@cse.bgu.ac.il. Web: `http://www.bgu.ac.il/~avin`.

Address and telephone number at home: Hatvuna 23/6 Beer-Sheva, Israel. Tel: 052-8018083.

Education

B.Sc. - 2000 (Cum Laude): Ben Gurion University - Communication Systems Engineering.

M.Sc. - 2003: University of California, Los Angeles (UCLA) - Computer Science.

Ph.D. - 2006: University of California, Los Angeles (UCLA) - Computer Science.

Name of advisors: Judea Pearl and Deborah Estrin.
Title of thesis: "Random Geometric Graphs: An Algorithmic Perspective".

Employment History

06/2016 – Present: Associate Professor, Ben-Gurion University of the Negev, Israel.

04/2011 – 05/2016: Senior Lecturer (Tenured - 06/2011), Ben-Gurion University of the Negev, Israel.

08/2013 – 07/2014: Visiting Professor, Computer Science Department, Brown University, RI, USA (Sabbatical, host Eli Upfal).

02/2014 – 05/2014: Long term visitor, Institute for Computational and Experimental Research in Mathematics (ICERM), Brown University, RI, USA.

2008–2009: Researcher, European Community's 7th Framework Program [FP7/2007-2013]. Ethernet Transport Network Architecture (ETNA), grant 215462. BGU, Israel.

10/2006 – 03/2011: Lecturer, Ben-Gurion University of the Negev, Israel.

04/2006 – 06/2006: Pos-Doctorate, University of Southern California (USC), CA, USA.

2002 – 2006: Research Assistant, University of California, Los Angeles (UCLA), CA, USA.

2001 – 2003: Teacher Associate, University of California, Los Angeles (UCLA), CA, USA.

2000 – 2001: Teacher Assistant, Ben-Gurion University of the Negev, Israel.

1996 – 2001: IT & Control Software Developer, Chemada Fine Chemicals, Israel.

Professional Activities

(a) Positions in academic administration

* 2021 – Current: Senate member. Ben-Gurion University of the Negev, Israel.

* 8/2019-2021: Department Head. Communication Systems Engineering Department, School of Electrical and Computer Engineering, Ben-Gurion University of the Negev, Israel.

* 8/2018: Department Chair. Communication Systems Engineering Department, Ben-Gurion University of the Negev, Israel.

* 2/2018: (deputy) Department Chair. Communication Systems Engineering Department, Ben-Gurion University of the Negev, Israel.

2014 – 2017: Head of Curriculum committee. Communication Systems Engineering Department, Ben-Gurion University of the Negev, Israel.

2011 – 2013: Head of Teaching committee. Communication Systems Engineering Department, Ben-Gurion University of the Negev, Israel.

2010 – 2011: Head of Curriculum committee. Communication Systems Engineering Department, Ben-Gurion University of the Negev, Israel.

2006 – 2010: Curriculum committee, member. Communication Systems Engineering Department, Ben-Gurion University of the Negev, Israel.

(b) Editor or member of editorial board of scientific or professional journal

* 03/2019 – Present: IEEE Transactions on Network and Service Management (TNSM). Associate Editor. Q1 Journal.

(c) Membership in professional/scientific societies

2011 – Present: Member, Association for Computing Machinery (ACM).

2001 – Present: Member, the Institute of Electrical and Electronics Engineers (IEEE).

(d) Ad-hoc reviewer for journals

IEEE/ACM Transactions on Networking, Discrete Mathematics, Pervasive and Mobile Computing, IEEE Transactions on Parallel and Distributed Systems, Theoretical Computer Science, IEEE Transactions on Computers, Distributed Computing, RANDOM STRUCTURES & ALGORITHMS, IEEE Transactions on Mobile Computing, Computer Networks, Wireless Communications and Mobile Computing, IEEE Transactions on Systems, Man, and Cybernetics, Information Processing Letters, IEEE Transactions on Network and Service Management.

Educational activities

(a) Courses taught

T1. * Introduction to Computer Networks - undergraduate level. - ECE School -BGU.

T2. * Computer Networks Design - undergraduate level - ECE School - BGU.

T3. Computer Networks - CS168, graduate and undergraduate level - Brown University.

T4. Computer Communication Networks 2, undergraduate level - BGU.

T5. Introduction to information Theory, undergraduate level - BGU.

T6. Network Algorithms, graduate level - BGU.

T7. Advance Digital Communication 2, graduate level - BGU.

T8. Advance Topics in Networking, graduate level - BGU.

T9. Social Networks, graduate and undergraduate level - BGU.

T10. Random Walks and Random Graphs, summer class, graduate level - USC.

T11. Causality (as TA), undergraduate level - UCLA.

T12. Introduction to Algorithms and Complexity, (as TA), undergraduate level - UCLA.

T13. Introduction to Computer Science II, (as TA), undergraduate level - UCLA.

T14. introduction to Computer Science I. (as TA), undergraduate level - UCLA.

(b) Research students

MSc. Students:

Ms1. 2009: Michael Borokhovich. (jointly with Dr. Zvi Lotker).
Thesis: "Algebraic algorithms for information spreading".

Ms2. 2010: Yaniv Dvory. Fast track. (jointly with Prof. Ran Giladi).
Thesis:"Arithmetic geographical coding and routing".

Ms3. 2010: Dotan Guy. Fast track. (jointly with Prof. Ran Giladi).
Thesis:"PSP - path state protocol for inter-dommain routing".

Ms4. 2011: Efi Dror. Fast track. (jointly with Dr. Zvi Lotker).
Thesis:"Vehicular ad-hoc networks simulator and hierarchical clustering algorithm".

Ms5. 2013: Omer Dunay. Fast track.
Thesis:"Virtual machine migration strategies to reduce communication cost".

Ms6. 2013: Liat Amir. Fast track.
Thesis:"Core-periphery decomposition in social networks".

Ms7. 2013: Assaf Mizrachi.
Thesis: "Majority vote and monopolies in social networks".

Ms8. 2013: Yoav Peer.
Thesis: "Optimization of random peer-to-peer botnet topology".

Ms9. 2015: Alex Hercules.
Thesis: "Communication-aware continuous-discrete network design".

Ms10. 2016: Yuri Lotker.
Thesis: "De-evolution of preferential attachment graphs".

Ms11. * 2018: Michal Vanunu.
Thesis: "Type assortativity in Social Networks"

Ms12. * 2019: Or Raz. Fast track.
Thesis: "NADJ: network-aware and adaptive multiway joins".

Ms13. * 2019: Chen Griner.
Thesis: "The Complexity of Traffic Traces and its Application for Network Design".

Ms14. * 2021: Raz Segal (jointly with Dr. Gabriel Scalosub).
Thesis: "Network Optimization for Distributed Machine Learning and Big Data".

Ms15. * 2022: Or Peres.
Thesis: "Distributed Demand-aware Network Design using Bounded Root of Graphsa".

Ms16. * Current: Elioz Geller. Fast track. (jointly with Dr. Gabriel Scalosub, expected graduation 2023).

PhD Students:

Ph1. 2013: Michael Borokhovich. (jointly with Prof. Zvi Lotker).
Thesis: "Algebraic algorithms for information spreading".

Ph2. * Current: Chen Griner. Combined track, Negev Scholarship. (expected graduation 2023).

Ph3. * Current: Raz Segal. Combined track, Negev Scholarship. (jointly with Dr. Gabriel Scalosub, expected graduation 2025).

Post-Docs:

Pd1. 2012: Dr. Yoram Haddad. One year. (jointly with Prof. Zvi Lotker).

Pd2. 2015: Dr. Andreas Loukas. One year. BGU and Berlin University. One year. (jointly with Dr. Stefan Schmid).

Pd3. * 2017-18 Dr. Hadassa Daltrophe.

Pd4. * 2017-18 Dr. Kaushik Mondal.

Awards, Citations, Honors, Fellowships

* 2019: INFOCOM Best In-session Presentation Award.

2007: Teaching excellence award, BGU.

2006: ACM/IEEE MSWiM Best Paper Award.

2001–2003: Teaching Assistant Fellowship, UCLA.

2001–2005: Ben Gurion University Foreign Study Scholarship.

2000: Graduated with Distinction, B.Sc. Ben Gurion University.

1997: Bezeq (Israel's telecommunications corporation) Scholarship.

Scientific Publications

Citation update date: 30/11/2022.
ISI: h-index 15. Citation count: 874. Without self-citations: 785.
Google Scholar:[1] h-index: 24. Citation count: 2803. Three papers above 200, Six above 100.

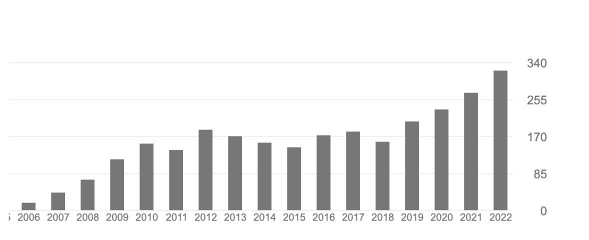

Figure 1: Citations per year, from Google Scholar.

(a) Refereed chapters in collective volumes, Conference proceedings, etc.

Conferences with acceptance rate about 25% or lower are marked with [⊕]. Core's conference ranking is indicated for [A*] or [A] conferences. Papers with Journal followup are marked with [J]. Papers that are part of a thesis of my student or are a joint work with a postdoc that I hosted in BGU are marked with [@] (only since last promotion).

C1. [J] **Chen Avin**[S] and Rachel Ben-Eliyahu Zohary[PI]. Algorithms for Computing X-Minimal Models. In *LPNMR-01. International Conference on Logic Programming and Nonmonotonic Reasoning*, pp 322–335, 2001. Citations (Google): 4.

C2. [A*] [⊕] **Chen Avin**[S] and Carlos Brito[S]. Efficient and robust query processing in dynamic environments using random walk techniques. In *Proceedings of the third international symposium on Information processing in sensor networks (IPSN-04)*, pp 277–286. ACM Press, 2004. (Acceptance rate 17.2%). Citations (ISI): 50. Citations (Google): 169.

[1] All Google Scholar citation data includes self citations.

C3. [A] [⊕] **Chen Avin**[S] and Gunes Ercal[S]. Bounds on the mixing time and partial cover of ad-hoc and sensor networks. In *Proceedings of the 2nd European Workshop on Wireless Sensor Networks (EWSN-05)*, pp 1–12, 2005. (Acceptance rate ≈ 25%). Citations (ISI): 8. Citations (Google): 21.

C4. [J] **Chen Avin**[S]. Fast and efficient restricted delaunay triangulation in random geometric graphs. In *Workshop on Combinatorial and Algorithmic Aspects of Networking (CAAN-05)*, 2005.

C5. [A*] [⊕] **Chen Avin**[S], Ilya Shpitser[S], and Judea Pearl[PI]. Identifiability of path-specific effects. In *IJCAI-05, Proceedings of the Nineteenth International Joint Conference on Artificial Intelligence, Edinburgh, Scotland, UK, July 30-August 5, 2005*, pp 357–363, 2005. (Acceptance rate 18%.). Citations (ISI): 83. Citations (Google): 210.

C6. [A] [⊕] [J] **Chen Avin**[S] and Gunes Ercal[S]. On the cover time of random geometric graphs. In *Proc. Automata, Languages and Programming, 32nd International Colloquium, ICALP-05*, pp 677–689, 2005. (Acceptance rate < 25%.). Citations (ISI): 15. Citations (Google): 67.

C7. [A] [⊕] [J] **Chen Avin**[PD] and Bhaskar Krishnamachari[PI]. The power of choice in random walks: An empirical study. In *Proc. of the 9th ACM/IEEE International Symposium on Modeling, Analysis and Simulation of Wireless and Mobile Systems, (MSWiM-06)*, pp 239–246, October 2006. **Best Paper Award**. (Acceptance rate ≈ 25%.). Citations (ISI): 18. Citations (Google): 72.

C8. [A] [⊕] [J] **Chen Avin**[PI], Michal Koucký[PI], and Zvi Lotker[PI]. How to explore a fast-changing world (cover time of a simple random walk on evolving graphs). In *ICALP-08, Automata, Languages and Programming*, pp 121–132, 2008. (Acceptance rate < 25%.) Citations (ISI): 92. Citations (Google): 200.

C9. [A] [⊕] [J] Noga Alon[PI], **Chen Avin**[PI], Michal Koucký[PI], Gady Kozma[PI], Zvi Lotker[PI], and Mark R. Tuttle[PI]. Many random walks are faster than one. In *SPAA-08: Proceedings of the 20th Annual ACM Symposium on Parallel Algorithms and Architectures*, pp 119–128, 2008. (Acceptance rate < 28%.). Citations (ISI): 43. Citations (Google): 156

C10. [A] [⊕] [J] Roy. Friedman[PI], Gabi. Kliot[S], and **Chen Avin**[PI]. Probabilistic quorum systems in wireless ad hoc networks. In *DSN-08. IEEE International Conference on Dependable Systems and Networks*, pp 277–286, 2008. (Acceptance rate < 25%.) Citations (ISI): 7. Citations (Google): 34

C11. [J] **Chen Avin**[PI]. Distance graphs: from random geometric graphs to bernoulli graphs and between. In Michael Segal and Alexander Kesselman, editors, *DIALM-POMC*, pp 71–78. ACM, 2008. Citations (Google): 15

C12. [J] **Chen Avin**[PI], Michael Borokhovich[S], and Arik Goldfeld[T]. Mastering (virtual) networks - a case study of virtualizing internet lab. In José A. Moinhos Cordeiro, Boris Shishkov, Alexander Verbraeck, and Markus Helfert, editors, *CSEDU-09* (2), pp 250–257. INSTICC Press, 2009. Citations (Google): 5.

C13. [J] **Chen Avin**[PI], Zvi Lotker[PI], Francesco Pasquale[S], and Yvonne-Anne Pignolet[PD]. A note on uniform power connectivity in the sinr model. *Algorithmic Aspects of Wireless Sensor Networks, Algosensors-09*, pp 116–127, 2009. Citations (ISI): 10. Citations (Google): 40.

C14. [A*] [⊕] [J] **Chen Avin**[PI], Yuval Emek[S], Erez Kantor[S], Zvi Lotker[PI], David Peleg[PI], and Liam Roditty[PD]. SINR diagrams: towards algorithmically usable sinr models of wireless networks. In Srikanta Tirthapura and Lorenzo Alvisi, editors, *PODC-09*, pp 200–209. ACM, 2009. (Acceptance rate < 25%.). Citations (ISI): 16. Citations (Google): 59.

C15. [A] [⊕] [J] **Chen Avin**[PI], Zvi Lotker[PI], and Yvonne Anne Pignolet[PD]. On the power of uniform power: Capacity of wireless networks with bounded resources. In Amos Fiat and Peter Sanders, editors, *ESA-09, volume 5757 of Lecture Notes in Computer Science*, pp 373–384. Springer, 2009. (Acceptance rate < 25%.). Citations (ISI): 12. Citations (Google): 25.

C16. **Chen Avin**[PI], Ran Giladi[PI], Nissan Lev-Tov[C], Zvi Lotker[PI]. From Trees to DAGs: Improving the Performance of Bridged Ethernet Networks. *Globecom-09*, pp 1–6. IEEE, 2009. (Acceptance rate ≈ 35%.) Citations (Google): 3.

C17. [A] [⊕] Marco Zuniga[PD], **Chen Avin**[PI] and Manfred Hauswirth[PI]. Querying dynamic wireless sensor networks with non-revisiting random walks. In the 7th European Conference on Wireless Sensor Networks, *EWSN-10*, pp 49-64. Springer. 2010. (Acceptance rate < 25%.) Citations (ISI): 8. Citations (Google): 11.

C18. [J] Michael Borokhovich[S], **Chen Avin**[PI] and Zvi Lotker[PI]. Tight Bounds for Algebraic Gossip on Graphs. In Proceedings, IEEE International Symposium on Information Theory (ISIT), pp 1758–1762, 2010. Citations (ISI): 25. Citations (Google): 45.

C19. [J] **Chen Avin**[PI], Yuval Lando[S], Zvi Lotker[PI]. Radio cover time in hyper-graphs. DIALM-POMC, pp 3–12, ACM 2010. Citations (Google): 11.

C20. [A*] [⊕] [J] **Chen Avin**[PI], Michael Borokhovich[S], Keren Censor-Hillel[PD], Zvi Lotker[PI]. Order Optimal Information Spreading Using Algebraic Gossip. in ACM Symposium on Principles of Distributed Computing *PODC-11*, pages 363–372. 2011. (Acceptance rate 26.4%.) Citations (ISI): 6. Citations (Google): 19.

C21. **Chen Avin**[PI], Michael Borokhovich[S], Asaf Cohen[PI], Zvi Lotker[PI]. Efficient Distributed Source Coding for Multiple Receivers Via Matrix Sparsification in IEEE International Symposium on Information Theory, *ISIT-11*. pages 2045 - 2049, 2011.

C22. **Chen Avin**[PI], Ran Giladi[C], Dotan Guy[S]. PSP: path state protocol for inter-domain routing in IEEE Symposium on Computers and Communications, *ISCC-11*, pages 287–293. 2011.

C23. **Chen Avin**[PI], Yaniv Dvory[S], Ran Giladi[C]. Geographical Quadtree Routing in IEEE Symposium on Computers and Communications, *ISCC-11*, pages 302-308. 2011. Citations (Google): 6.

C24. [J] Efi Dror[S], **Chen Avin**[PI], Zvi Lotker[PI]. Fast randomized algorithm for hierarchical clustering in Vehicular Ad-Hoc Networks, *Med-Hoc-Net*, pages 1–8, 2011. Citations (Google): 68.

C25. [A*] [⊕] [J] **Chen Avin**[PI], Asaf Cohen[PI], Yoram Haddad[PD], Erez Kantor[PD], Zvi Lotker[PI], Merav Parter[S], and David Peleg[PI]. SINR Diagram with Interference Cancellation, ACM-SIAM Symposium on Discrete Algorithms, *SODA-12*, pages 502–515, 2012. (Acceptance rate 26.7%.) Citations (Google): 13.

C26. Bernhard Haeupler[S], Asaf Cohen[PI], **Chen Avin**[PI], and Muriel Médard[PI]. Network Coded Gossip with Correlated Data, in IEEE International Symposium on Information Theory, *ISIT-12*. pages 2616–2620. 2012. Citations (Google): 8.

C27. **Chen Avin**[PI], Michael Borokhovich[S], Yoram Haddad[PD], and Zvi Lotker[PI]. Optimal Virtual Traffic Light Placement, in *FOMC*. Article No. 6. 2012. Citations (Google): 13.

C28. [A] [J] Stefan Schmid[PI], **Chen Avin**[PI], Christian Scheideler[PI], Bernhard Haeupler[S], and Zvi Lotker[PI]. Brief Announcement: SplayNets - Towards Self-Adjusting Distributed Data Structures, in *DISC-12*, pages 439–440, 2012.

C29. [A*] [⊕] [J] **C. Avin**[PI], M. Borokhovich[S], Y. Haddad[PD], E. Kantor[PD], Z. Lotker[PI], M. Parter[S], and D. Peleg[PI]. Generalized Perron–Frobenius Theorem for Multiple Choice Matrices and Applications, In *SODA-13*. pages 478–497. 2013. (Acceptance rate 29.7%.) Citations (Google): 4.

C30. [A] [⊕] [J] **Chen Avin**[PI], Bernhard Haeupler[PD], Zvi Lotker[PI], Christian Scheideler[PI], and Stefan Schmid[PI]. Locally Self-Adjusting Tree Networks, In *IPDPS-13*. pages 395–406. 2013. (Acceptance rate 22.0%.). Citations (ISI): 4. Citations (Google): 20

C31. [⊕] [J] **Chen Avin**[PI], Michael Borokhovich[S], Stefan Schmid[PI]. OBST: A self-adjusting peer-to-peer overlay based on multiple BSTs. In *P2P 2013* pages 1–5. 2013. (Acceptance rate 19.2%.) Citations (ISI): 1. Citations (Google): 8

C32. [J] **Chen Avin**[PI], Michael Borokhovich[S], Bernhard Haeupler[S], Zvi Lotker[PI]. Self-adjusting Grid Networks to Minimize Expected Path Length. In *SIROCCO 2013*. pages 36–54. 2013. Citations (Google): 8

C33. [A] [⊕] [J] **Chen Avin**[PI], Robert Elsässer[PI]. Faster Rumor Spreading: Breaking the $\log(n)$ Barrier. In *DISC-13*. pages: 209-223. 2013. (Acceptance rate 19%.) Citations (ISI): 1. Citations (Google): 7.

C34. **Chen Avin**[PI], Omer Dunay[S], Stefan Schmid[PI]. Strategies for Traffic-Aware VM Migration. In *In Proceedings of the 2013 IEEE/ACM 6th International Conference on Utility and Cloud Computing*, UCC-13, pages 305–306, 2013.

C35. [A] [⊕] [J] **Chen Avin**[PI], Michael Borokhovich[PD], Zvi Lotker[PI], David Peleg[PI]. Distributed Computing on Core-Periphery Networks: Axiom-Based Design. In *ICALP (2) 2014*. pages 399–410. 2014. (Acceptance rate about 28%.) Citations (ISI): 4.

C36. [A] [⊕] **Chen Avin**[PI], Barbara Keller[S], Zvi Lotker[PI], Claire Mathieu[PI], David Peleg[PI], Yvonne-Anne Pignolet[PI]. Homophily and the Glass Ceiling Effect in Social Networks. In *ITCS 2015*. pages 41–50. 2015. Citations (Google): 31.

C37. [A ⊕] **Chen Avin**[PI], Zvi Lotker[PI], David Peleg[PI], Yinon Nahum[S]. Core Size and Densification in Preferential Attachment Networks. In *ICALP 2015*. pages 492-503. 2015. (Acceptance rate about 28%.) Citations (ISI): 1. Citations (Google): 12.

C38. [A ⊕ J] **Chen Avin**[PI], Zvi Lotker[PI], David Peleg[PI], Itzik Turkel[S]. Social Network Analysis of Program Committees and Paper Acceptance Fairness. In *ASONAM 2015*. pages 488-495. 2015. Acceptance rate about 18%.) Citations (ISI): 1. Citations (Google): 5.

C39. * [A ⊕ @] **Chen Avin**[PI], Andreas Loukas[PD], Maciej Pacut[S], Stefan Schmid[PI]. Online Balanced Repartitioning. In *DISC 2016*, pages 243–256. 2016. Acceptance rate about 25%. Citations (Google): 13.

C40. * [A ⊕] John Augustine[PI], **Chen Avin**, Mehraneh Liaee[S], Gopal Pandurangan[PI], Rajmohan Rajaraman[PI]. Information Spreading in Dynamic Networks Under Oblivious Adversaries. In *DISC 2016*, pages 399-413. 2016. Acceptance rate about 25%. Citations (Google): 7.

C41. * [J] **Chen Avin**[PI], Zvi Lotker[PI], David Peleg[PI], Yvonne-Anne Pignolet[PI], Itzik Turkel[S]. Core-Periphery in Networks: An Axiomatic Approach. In *NetSci-X 2017*: 75–87. 2017. Citations (Google): 3.

C42. * **Chen Avin**[PI], Zvi Lotker[PI], David Peleg[PI], Yinon Nahum[S]. Modeling and Analysis of Glass Ceiling and Power Inequality in Bi-populated Societies. In *NetSci-X 2017*, 2017.

C43. * [J @] **Chen Avin**[PI], Louis Cohen[S], and Stefan Schmid[PI]. Competitive Clustering of Stochastic Communication Patterns on the Ring. In *NETYS 2017* 231–247. 2017.

C44. * [@] **Chen Avin**[PI], Hadassa Daltrophe[PD], Zvi Lotker[PI], David Peleg[PI]. Assortative Mixing Equilibria in Social Network Games. In *Gamenets-17*, pages 29–39. 2017.

C45. * [A* ⊕] **Chen Avin**[PI], Zvi Lotker[PI], David Peleg[PI], Yinon Nahum[S]. Improved Degree Bounds and Full Spectrum Power Laws in Preferential Attachment Networks. In *KDD-17*, pages 45–53. 2017. Citations (Google): 4.

C46. * [A ⊕ J] Bruna Peres[S], Olga Goussevskaia[PI], Stefan Schmid[PI], **Chen Avin**[PI]. Brief Announcement: Concurrent Self-Adjusting Distributed Tree Networks. In *DISC-17*, pages 58:1–58:3. 2017.

C47. * [A ⊕ J @] **Chen Avin**[PI], Kaushik Mondal[PD], Stefan Schmid[PI]. Demand-Aware Network Designs of Bounded Degree. In *DISC-17*, pages 5:1–5:16. 2017. Citations (Google): 22.

C48. * [@ A ⊕] Michal Vaanunu[S], **Chen Avin**[PI]. Homophily and Nationality Assortativity Among the Most Cited Researchers' Social Network. (3 pages). In *ASONAM 2018*: 584–586. 2018. Citations (ISI): 1. Citations (Google): 3.

C49. * [A* ⊕] **Chen Avin**[PI], Avi Cohen[S], Pierre Fraigniaud[PI], Zvi Lotker[PI], David Peleg[PI]. Preferential Attachment as a Unique Equilibrium. In *WWW 2018* 559-568. 2018. Citations (ISI): 1. Citations (Google): 5

C50. * [J] **Chen Avin**[PI], Ingo van Duijn[PD], Stefan Schmid[PI]. Self-adjusting Linear Networks (Brief Announcement). In *SIROCCO* 2019: 332-335.

C51. * [A] [⊕] **Chen Avin**[PI], Iosif Salem[PD], Stefan Schmid[PI]. Brief Announcement: On Self-Adjusting Skip List Networks. In *DISC* 2019: 35:1-35:3.

C52. * [@] **Chen Avin**[PI], Zvi Lotker[PI], Assaf Mizrachi[S], David Peleg[PI]. Majority vote and monopolies in social networks. In *ICDCN 2019*: 342–351. 2019.

C53. * [J] **Chen Avin**[PI], Ingo van Duijn[PD], Stefan Schmid[PI]. Self-adjusting Linear Networks. In *SSS 2019*: 368-382. 2019

C54. * [A] [@] Or Raz[S], **Chen Avin**[PI], Stefan Schmid[PI]. Nap: Network-Aware Data Partitions for Efficient Distributed Processing. In *NCA 2019*: 2019.

C55. * [A] [⊕] **Chen Avin**[PI], Zvi Lotker[PI], Yinon Nahum[S]and David Peleg[PI]. Random Preferential Attachment Hypergraphs. In *ASONAM 2019*: 398–405. 2019. Citations (Google): 3.

C56. * [A*] [⊕] Bruna Soares Peres[S], Otavio Augusto de Oliveira Souza[S], Olga Goussevskaia[PI], **Chen Avin**[PI], Stefan Schmid[PI]. Distributed Self-Adjusting Tree Networks. In *INFOCOM 2019*: 145–153. 2019. Citations (Google): 10.

C57. * [A*] [⊕] [@] **Chen Avin**[PI], Kaushik Mondal[PD], Stefan Schmid[PI]. Demand-Aware Network Design with Minimal Congestion and Route Lengths. In *INFOCOM 2019*: 1351–1359. 2019. Citations (Google): 13.

C58. * [A*] [⊕] **Chen Avin**[PI], Iosif Salem[PD], Stefan Schmid[PI]. Working Set Theorems for Routing in Self-Adjusting Skip List Networks. In *INFOCOM 2020*: 2175–2184, 2020.

C59. * [@] **Chen Avin**[PI], Kaushik Mondal[PD]and Stefan Schmid[PI]. Dynamically Optimal Self-Adjusting Single-Source Tree Networks. In *LATIN 2020*: 143–154

C60. * [A*] [⊕] [@] **Chen Avin**[PI], Manya Ghobadi[PI], Chen Griner[S], Stefan Schmid[PI]. On the Complexity of Traffic Traces and Implications. In *Proc. ACM Meas. Anal. Comput. Syst.* 4(1): 20:1–20:29, 2020.

C61. * [@] **Chen Avin**[PI] and Yuri Lotker[S]. De-evolution of Preferential Attachment Trees. In *The 9th International Conference on Complex Networks and their Applications*. 508–519 . 2020.

C62. * **Chen Avin**[PI] and Stefan Schmid[PI]. ReNets: Toward Statically Optimal Self-Adjusting Networks. In *APOCS* 2021: 25–39

C63. * [A] [⊕] [J] [@] Chen Griner[S] and **Chen Avin**[PI]. CacheNet: Leveraging the Principle of Locality in Reconfigurable Network Design. In *IFIP Networking 2021*: 1–3. (3 pages).

C64. * [A] [⊕] [@] Raz Segal[S], **Chen Avin**[PI], Gabriel Scalosub[PI]. SOAR: minimizing network utilization with bounded in-network computing. In *CoNEXT 2021*. 16–29. 2021. (Acceptance rate 15.8%).

C65. * Johannes Zerwas[S], **Chen Avin**[PI], Stefan Schmid[PI], Andreas Blenk[PI]. ExRec: Experimental Framework for Reconfigurable Networks Based on Off-the-Shelf Hardware. In *ANCS 2021*: 66-72

C66. * A* ⊕ @ Chen Griner[S], Johannes Zerwas[S], Andreas Blenk[PI], Manya Ghobadi[PI], Stefan Schmid[PI], **Chen Avin**[PI]. Cerberus: The Power of Choices in Datacenter Topology Design - A Throughput Perspective. In *Proc. ACM Meas. Anal. Comput. Syst.* 5(3): 38:1-38:33 (2021).

C67. * A* ⊕ @ Raz Segal[S], **Chen Avin**[PI], Gabriel Scalosub[PI]. Constrained In-network Computing with Low Congestion in Datacenter Networks. In *INFOCOM 2022*: 1639-1648, 2022.

C68. * A ⊕ **Chen Avin**[PI], Marcin Bienkowski[PI], Iosif Salem[PD], Robert Sama[S], Stefan Schmid[PI], Pawel Schmidt[PD]. Deterministic Self-Adjusting Tree Networks Using Rotor Walks. In *ICDCS 2022*: 67-77. 2022.

C69. * A* ⊕ @ Arash Pourdamghani[S], **Chen Avin**[PI], Robert Sama[S], Stefan Schmid[PI]. SeedTree: A Dynamically Optimal and Local Self-Adjusting Tree. Accepted to *INFOCOM 2023*, 2023.

C70. * A* ⊕ Or Peres[S], **Chen Avin**[PI]. Distributed Demand-aware Network Design using Bounded Square Root of Graphs. Accepted to *INFOCOM 2023*, 2023.

(b) Refereed articles in scientific journals

Papers that are part of a thesis of my student or are a joint work with a postdoc that I hosted in BGU are marked with @ (since last promotion).

J1. **Chen Avin**[S] and Rachel Ben-Eliyahu-Zohary[PI]. An upper bound on computing all x-minimal models. *AI Communications*, 20(2):87–92, 2007. Impact Factor: 0.755. Journal Ranking: 83/115. Q2. Citations (ISI): 1. Citations (Google): 3.

J2. **Chen Avin**[S] and Gunes Ercal[S]. On the cover time and mixing time of random geometric graphs. *Theor. Comput. Sci.*, 380(1-2):2–22, 2007. Impact Factor: 1.103. Journal Ranking: 52/92. Q3. Citations (ISI): 65. Citations (Google): 118.

J3. **Chen Avin**[S] and David Dayan-Rosenman[S]. Evolutionary reputation games on social networks. *Complex Systems*, 17:259–277, 2007. Citations (ISI): 2. Citations (Google): 3.

J4. Joon Ahn[S], Shyam Kapadia[S], Sundeep Pattem[S], Avinash Sridharan[S], Marco Zuniga[S], Jung-Hyun Jun[S], **Chen Avin**[PD], and Bhaskar Krishnamachari[PI]. Empirical evaluation of querying mechanisms for unstructured wireless sensor networks. *SIGCOMM Comput. Commun. Rev.*, 38(3):17–26, 2008. Impact Factor: 2.695. Journal Ranking: 63/135. Q2. Citations (ISI): 1. Citations (Google): 19.

J5. **Chen Avin**[PD] and Bhaskar Krishnamachari[PI]. The power of choice in random walks: An empirical study. *Computer Networks*, 52(1):44–60, 2008. Impact Factor: 1.871. Journal Ranking: 17/50. Q2. Citations (ISI): 26. Citations (Google): 108.

J6. **Chen Avin**[PI]. Fast and efficient restricted delaunay triangulation in random geometric graphs. *Internet Mathematics*, 5(3):195–210, 2008. Citations (ISI): 1 Citations (Google): 19.

J7. Marco Zuniga[S], **Chen Avin**[PD], and Bhaskar Krishnamachari[PI]. Using heterogeneity to enhance random walk-based queries. *Journal of Signal Processing Systems*, 57(3):401–404, 2009. Impact Factor: 0.713. Journal Ranking: 89/133. Q3. Citations (ISI): 1. Citations (Google): 7.

J8. Roy Friedman[PI], Gabriel Kliot[S], and **Chen Avin**[PI]. Probabilistic Quorum Systems in Wireless Ad Hoc Networks. *ACM Transactions on Computer Systems*, 28(3):1–50. 2010. Impact Factor: 2.531. Journal Ranking: 26/99. Q2. Citations (ISI): 7. Citations (Google): 40.

J9. Noga Alon[PI], **Chen Avin**[PI], Michal Koucký[PI], Gady Kozma[PI], Zvi Lotker[PI], and Mark R. Tuttle[PI]. Many random walks are faster than one. *Combinatorics, Probability & Computing*, 20(4): 481-502 (2011). Impact Factor: 0.778. Journal Ranking: 73/288. Q1. Citations (ISI): 32. Citations (Google): 208.

J10. Eliav Menachi[S], **Chen Avin**[PI], and Ran Giladi[PI]. Scalable, Hierarchical, Ethernet Transport Network Architecture (HETNA). *Telecommunication Systems*, 49(3): 299-312 (2012). Impact Factor: 1.201. Journal Ranking: 37/78. Q2. Citations (ISI): 3. Citations (Google): 6.

J11. **Chen Avin**[PI], Zvi Lotker[PI], Francesco Pasquale[S], and Yvonne-Anne Pignolet[PD]. A note on uniform power connectivity in the sinr model. *Theor. Comput. Sci.*. 453: 2–13 (2012). Impact Factor: 0.697. Journal Ranking: 76/102. Q3. Citations (ISI): 11. Citations (Google): 3 (40).

J12. **Chen Avin**[PI], Yuval Emek[S], Erez Kantor[S], Zvi Lotker[PI], David Peleg[PI], and Liam Roditty[PD]. SINR Diagrams: Convexity and its Applications in Wireless Networks. *Journal of the ACM*, 59(4): 18 (2012). Impact Factor: 2.939. Journal Ranking: 3/105. Q1. Citations (ISI): 12. Citations (Google): 33.

J13. Efi Dror[S], **Chen Avin**[PI], Zvi Lotker[PI], Fast Randomized Algorithm for 2-Hops Clustering in Vehicular Ad-Hoc Networks. *Ad Hoc Networks*, 11(7): 2002–2015, 2013. Impact Factor: 2.488. Journal Ranking: 22/135. Q1. Citations (ISI): 15. Citations (Google): 28

J14. **Chen Avin**[PI], Michael Borokhovich[S], Keren Censor-Hillel[PD], Zvi Lotker[PI]. Order Optimal Information Spreading Using Algebraic Gossip. *Distributed Computing*, 26(2):99–117, 2013. Impact Factor: 0.872. Journal Ranking: 67/100. Q3. Citations (ISI): 3. Citations (Google): 20.

J15. Michael Borokhovich[S], **Chen Avin**[PI], and Zvi Lotker[PI]. Bounds for Algebraic Gossip on Graphs. *Random Structures and Algorithms*, 45(2):185–217. 2014. Impact Factor: 1.127. Journal Ranking: 35/295. Q1. Citations (ISI): 1. Citations (Google): 1.

J16. **Chen Avin**[PI], Yuval Lando[S], Zvi Lotker[PI]. Radio cover time in hyper-graphs. *Ad Hoc Networks*, 12: 278–290, 2014. Impact Factor: 2.488. Journal Ranking: 22/135. Q1. Citations (ISI): 1. Citations (Google): 5.

J17. **C. Avin**[PI], M. Borokhovich[S], Y. Haddad[PD], E. Kantor[PD], Z. Lotker[PI], M. Parter[S], and D. Peleg[PI]. Testing the irreducibility of nonsquare perron-frobenius systems. *Information Processing Letters*, 114(12): 728–733. 2014. Impact Factor: 0.595. Journal Ranking: 109/135. Q4. Citations (ISI): 1. Citations (Google): 4.

J18. **Chen Avin**[PI], Michael Borokhovich[S], Bernhard Haeupler[S], Zvi Lotker[PI]. Self-adjusting Grid Networks to Minimize Expected Path Length. *Theor. Comput. Sci.*. 584: 91–102 (2015). Impact Factor: 0.516. Journal Ranking: 76 of 102. Q3. Citations (ISI): 3. Citations (Google): 8.

J19. Bernhard Haeupler[S], Asaf Cohen[PI], **Chen Avin**[PI], and Muriel Médard[PI]. Network Coding Based Information Spreading in Dynamic Networks with Correlated Data, *IEEE JSAC Special Issue on Network Coding*, 33(2):213–224, 2015. Impact Factor: 4.932. Journal Ranking: 4/78. Q1. Citations (ISI): 5. Citations (Google): 7.

J20. Stefan Schmid[PI], **Chen Avin**[PI], Christian Scheideler[PI], Michael Borokhovich[S], Bernhard Haeupler[S], and Zvi Lotker[PI]. SplayNet: Towards Locally Self-Adjusting Networks, *IEEE/ACM Transactions on Networking*. 24(3): 1421-1433. 2016. Impact Factor: 2.969. Journal Ranking: 13/102. Q1. Citations (ISI): 4. Citations (Google): 32.

J21. **Chen Avin**[PI], Zvi Lotker[PI], David Peleg[PI], Itzik Turkel[S]. On Social Networks of Program Committees. Invited paper to Social Network Analysis and Mining. 2016. *Social Network Analysis and Mining*, 6(1): 18:1-18:20. 2016. ISI: N/A. (SJR Q1) Citations (ISI): 2. Citations (Google): 2.

J22. **Chen Avin**[PI], Zvi Lotker[PI], and Yvonne Anne Pignolet[PI]. On the power of uniform power: Capacity of wireless networks with bounded resources. *Wireless Networks*. 23(8): 2319–2333. 2017. Impact Factor: 1.587. Journal Ranking: 41/87. Q2. Citations (ISI): 1. Citations (Google): 25.

J23. * **Chen Avin**[PI], Asaf Cohen[PI], Yoram Haddad[PD], Erez Kantor[PD], Zvi Lotker[PI], Merav Parter[S], and David Peleg[PI]. SINR diagram with interference cancellation. *Ad Hoc Networks*, 54: 1-16. 2017. Impact Factor: 3.047. Journal Ranking: 33/146. Q1. Citations (ISI): 4. Citations (Google): 5.

J24. * [@] **Chen Avin**[PI], Michael Borokhovich[S], Zvi Lotker[PI], David Peleg[PI]. Distributed Computing on Core-Periphery Networks: Axiom-Based Design. *Journal of Parallel and Distributed Computing*, 99: 51–67. 2017. Impact Factor: 1.930. Journal Ranking: 34/104. Q2. Citations (ISI): 3. Citations (Google): 11.

J25. * **Chen Avin**[PI], Robert Elsässer[PI]. Breaking the $\log(n)$ Barrier on Rumor Spreading. *Distributed Computing*. 31(6): 503–513. 2018. Impact Factor: 1.672. Journal Ranking: 40/104. Q2. Citations (Google): 1.

J26. * **Chen Avin**[PI], Stefan Schmid[PI]. Toward Demand-Aware Networking: A Theory for Self-Adjusting Networks. *ACM SIGCOMM CCR 48*, 5 (2018), 31–40 (editorial). Impact Factor: 1.74. Journal Ranking: 95/155. Q3 (SJR Q1). Citations (ISI): 1. Citations (Google): 22.

J27. * **Chen Avin**[PI], Zvi Lotker[PI], David Peleg[PI], Yvonne-Anne Pignolet[PI], Itzik Turkel[S]. Elites in social networks: An axiomatic approach to power balance and Price's square root law. *PloS one* 13(10): e0205820. 2018. Impact Factor: 2.776. Journal Ranking: 24/69. Q2 (SJR Q1).

J28. * @ **Chen Avin**[PI], Alexandr Hercules[S], Andreas Loukas[PD], Stefan Schmid[PI]. rDAN: Toward robust demand-aware network designs. *Inf. Process. Lett.* 133: 5–9. 2018. Impact Factor: 0.914. Journal Ranking: 133/155. Q4 (SJR Q2). Citations (ISI): 2. Citations (Google): 12.

J29. * **Chen Avin**[PI], Michal Koucký[PI], Zvi Lotker[PI]. Cover time and mixing time of random walks on dynamic graphs. *Random Struct. Algorithms* 52(4): 576–596. 2018. Impact Factor: 1.008. Journal Ranking: 90/314. Q2 (SJR Q1). Citations (ISI): 2. Citations (Google): 6.

J30. * **Chen Avin**[PI], Louis Cohen[S], Mahmoud Parham[S], Stefan Schmid[PI]. Competitive clustering of stochastic communication patterns on a ring. *Computing* 101(9): 1369-1390 (2019). Impact Factor: 2.061. Journal Ranking: 38/105. Q2. Citations (Google): 2.

J31. * @ **Chen Avin**[PI], Kaushik Mondal[PD], Stefan Schmid[PI]. Demand-Aware Network Designs of Bounded Degree. *Distributed Comput.* 33(3-4): 311-325 (2020) Impact Factor: 1.326. Journal Ranking: 54/105. Q3. (SJR Q1) Citations (Google): 22.

J32. * **Chen Avin**[PI], Marcin Bienkowski[PI], Andreas Loukas[PD], Maciej Pacut[S], Stefan Schmid[PI]. Dynamic Balanced Graph Partitioning. *SIAM J. Discret. Math.* 34(3): 1791-1812 (2020) Impact Factor: 0.843. Journal Ranking: 174/254. Q4. (SJR Q1).

J33. * @ **Chen Avin**[PI], Hadassa Daltrophe[PD], Barbara Keller[S], Zvi Lotker[PI], Claire Mathieu[PI], David Peleg[PI], Yvonne-Anne Pignolet[PI]. Mixed Preferential Attachment Model: Homophily and Minorities in Social Networks. *Physica A: Statistical Mechanics and its Applications.* Volume 555. 2020. Impact Factor: 2.5. Journal Ranking: 26/81. Q2.

J34. * B. Peres[S], O. A. d. O. Souza[S], O. Goussevskaya[PI], **C. Avin**[PI] and S. Schmid[PI], Distributed Self-Adjusting Tree Networks. To appear *IEEE Transactions on Cloud Computing*, Q1. 2021. Impact Factor: 5.938. Journal Ranking: 11/110. Q1.

J35. * **Chen Avin**[PI], Avi Cohen[S], Zvi Lotker[PI], David Pelegi[PI]. Hotelling Games in Fault-Prone Settings. Accepted to *Theor. Comput. Sci.* 922: 96–107. 2022 Impact Factor: 0.827. Journal Ranking: 91/110. Q4.

J36. * @ Chen Griner[S], Stefan Schmid[PI], **Chen Avin**[PI]. CacheNet: Leveraging the principle of locality in reconfigurable network design. To appear *Computer Networks.* Volume 204, 2022. Impact Factor: 4.474. Journal Ranking: 9/53. Q1.

J37. * @ **Chen Avin**[PI], Kaushik Mondal[PD], Stefan Schmid[PI]. Demand-Aware Network Design with Minimal Congestion and Route Lengths. Accepted to *IEEE/ACM Transactions on Networking.* 30(4): 1838–1848. 2022. Impact Factor: 3.560. Journal Ranking: 21/110. Q1.

J38. * @ **Chen Avin**[PI], Kaushik Mondal[PD], Stefan Schmid[PI]. Push-Down Trees: Optimal Self-Adjusting Complete Trees. Accepted to *IEEE/ACM Transactions on Networking.* 2022. Impact Factor: 3.560. Journal Ranking: 21/110. Q1.

Lectures and Presentations at Meetings and Invited Seminars

(a) Invited plenary lectures at conferences/meetings

Pa1. 2007: Identifiability of Path-Specific Effects. International Workshop on the Interface between Statistical Causal Inference and Bayesian Networks. Tokyo, Japan.

Pa2. 2009: Random walks techniques for wireless networks. The 8th IFIP Annual Mediterranean Ad Hoc Networking Workshop. Haifa, Israel.

Pa3. 2015: Teaching Social Network Analysis with Mathematica. The Wolfram Technology Users Conference. Israel 2015. Tel-Aviv, Israel.

Pa4. * 2019: Toward Demand-Aware Networks: Vision and Algorithms. Huawei Vision Forum, London, UK.

Pa5. * 2022: Cerberus: The Power of Choices in Datacenter Topology Design – A Throughput Perspective. Huawei Future Networks, Israel.

(b) Presentation of papers at conferences/meetings

Pb1. 2004: Efficient and Robust Query Processing in Dynamic Environments Using Random Walk Techniques. The third international symposium on Information processing in sensor networks IPSN04, Berkeley, USA.

Pb2. 2005: On The Cover Time of Random Geometric Graphs. The 32nd International Colloquium, ICALP05, Lisbon, Portugal.

Pb3. 2006: The Power of Choice in Random Walks: An Empirical Study. 9th ACM/IEEE International Symposium on Modeling, Analysis and Simulation of Wireless and Mobile Systems, (MSWiM), Malaga, Spain. **Best Paper Award**.

Pb4. 2008: Distance Graphs: From Random Geometric Graphs to Bernoulli Graphs and Between. DIALM-POMC 2008. Toronto, Canada.

Pb5. 2010: Radio Cover Time in Hyper-graphs. DIALM-POMC 2010. Boston, USA.

Pb6. 2011: PSP: path state protocol for inter-domain routing. ISCC-11, Corfu, Greece.

Pb7. 2011: Geographical Quadtree Routing. ISCC-11, Corfu, Greece.

Pb8. 2013: Faster Rumor Spreading: Breaking the $\log(n)$ Barrier. DISC-13. Jerusalem. Israel

Pb9. 2014: Elite, Periphery and Symmetry in Social Networks- An Axiomatic Approach. Stochastic Graph Models Workshop, ICERM, Providence, RI. USA.

Pb10. * 2016: Online Balanced Repartitioning. DISC-16. Paris. France

Pb11. * 2019: Demand-Aware Network Design with Minimal Congestion and Route Lengths. INFOCOM 2019, Paris. France

Pb12. * 2019: **Topic Preview Presentation**: Technical Session 10: New Control Plane Operations . SIGCOMM 2019, Beijing. China.

Pb13. * 2020: De-evolution of Preferential Attachment Trees. International Conference on Complex Networks and their Applications. 2020 (via Zoom).

Pb14. * 2020: Dynamically Optimal Self-Adjusting Single-Source Tree Networks. LATIN 2020. 2020 (via Zoom).

(c) Presentations at informal international seminars and workshops

Pc1. 2007: Random Walks Techniques in Networking. Algorithms, Inference, & Statistical Physics (AISP) workshop. Santa Fe, NM. USA.

Pc2. 2008: How to Explore a Fast-Changing World . Israeli Networking Seminar 2008. Cisco, Israel.

Pc3. 2008: How to Explore a Fast-Changing World . Random Walks Day. BGU, Israel.

Pc4. 2010: New Routing Protocols for Ethernet Transport Network Architecture (ETNA). The Israeli Hungarian Workshop on Future Internet Research. Haifa, Israel.

Pc5. 2011: Order Optimal Information Spreading Using Algebraic Gossip. Israeli Networking Seminar 2011. Google, Israel.

Pc6. 2013: From Caesar to Twitter: On the Elite of Social Networks, Dagstuhl Seminar 13042, Germany.

Pc7. * 2017: Demand Aware Network (DAN) Design, Some Results and Open Questions. DIMACS Workshop on Algorithms for Data Center Networks. Rutgers University, NJ, USA.

Pc8. * 2019: Toward Demand-Aware Networks: Vision and Algorithms. Israeli Networking Day, Marvell, Petah Tikva, Israel.

Pc9. 2022: Self-Adjusting Networks, Dagstuhl Seminar 22471, Germany. **Keynote talk**.

(d) Seminar presentations at universities and institutions

Ps1. 2003: Sensor Networks: What does (U)AI got to do with it? AI Group Seminar, UCLA. USA.

Ps2. 2003: The Sensor Networks Challenge. CSE Seminar, BGU. Israel, December-2003.

Ps3. 2004: Efficient and Robust Query Processing in Dynamic Environments Using Random Walk Techniques. CENS Seminar, UCLA. USA.

Ps4. 2005: Distance Graphs: From Random Geometric Graphs to Bernoulli Graphs and Between. Theory Group Seminar, UCLA. USA.

Ps5. 2006: Random Walks on Random Wireless Networks. Networking Group Seminar, UCLA, USA. January-2006.

Ps6. 2006: Random Geometric Graphs: an Algorithmic Perspective. Autonomous Networks Research Group Seminar, USC, USA.

Ps7. 2006: Random Walks Techniques For Random Wireless networks. Communication Systems Engineering Seminar, Ben Gurion University, Israel.

Ps8. 2007: Many Random Walks Are Faster Than One. CS Colloquium, Ben Gurion University. Israel.

Ps9. 2007: On The Cover Time and Mixing Time of Random Geometric Graphs. CS Colloquium, Technion. Israel.

Ps10. 2007: Enhancing Random Walks Efficiency. CS Colloquium, Tel-Aviv University. Israel.

Ps11. 2007: Many Random Walks Are Faster Than One. CS/Engineering school Colloquium, Hebrew University. Israel.

Ps12. 2009: SINR Diagrams: Towards Algorithmically Usable SINR Models of Wireless Networks. Networking group seminar. UCLA. USA.

Ps13. 2009: How to Explore a Fast-Changing World. ANRG group seminar. USC. USA.

Ps14. 2009: SINR Diagrams: Towards Algorithmically Usable SINR Models of Wireless Networks. ANRG group seminar, USC. USA.

Ps15. 2009: Random walks techniques for wireless networks. CS seminar, UC Irvine. USA.

Ps16. 2009: Algebraic Gossip via EXCHANGE: Analytical and Simulation Results. ClubNet seminar, Technion. Israel.

Ps17. 2009: Algebraic Gossip via EXCHANGE: Analytical and Simulation Results. Seminar on Theoretical Computer Science, University of Paderborn. Germany.

Ps18. 2010: SINR Diagrams: Towards Algorithmically Usable SINR Models of Wireless Networks, University of Freiburg. Germany.

Ps19. 2010: Tight Bounds for Algebraic Gossip on Graphs. CS Colloquium, Bar-Ilan University. Israel.

Ps20. 2010: Random Walks for (Wireless) Networks. The Harvard Theory of Computation Seminar. Harvad. USA.

Ps21. 2012: The Elite of Social Networks. Social Networks Seminar. BGU.

Ps22. 2012: Random walks techniques for (wireless) networks. MPI. Saarbrücken. Germany.

Ps23. 2012: Self-Adjusting Networks and Distributed Data Structures. ClubNet seminar, Technion. Israel.

Ps24. 2012: From Caesar to Twitter: On the Elite of Social Networks. Social networks seminar. Google, Mountain view, CA. USA.

Ps25. 2012: From Caesar to Twitter: On the Elite of Social Networks, USC. USA.

Ps26. 2012: From Caesar to Twitter: On the Elite of Social Networks, Google R&D Seminar, Tel Aviv, Israel.

Ps27. 2013: From Caesar to Twitter: On the Elite of Social Networks, Tel-Aviv University, Israel.

Ps28. 2013: From Caesar to Twitter: On the Elite of Social Networks, Northeastren University, Boston, MA. USA.

Ps29. 2014: Homophily and the Emergence of a Glass Ceiling Effect in Social Networks. Microsoft Research. Boston, MA. USA.

Ps30. 2014: Homophily and the Emergence of a Glass Ceiling Effect in Social Networks. Microsoft Research. Mountain View, CA. USA.

Ps31. 2014: Homophily and the Emergence of a Glass Ceiling Effect in Social Networks. Princeton University. Princeton, NJ. USA.

Ps32. 2014: Homophily and the Emergence of a Glass Ceiling Effect in Social Networks. Harvard University. Boston, MA. USA.

Ps33. 2014: Homophily and the Emergence of a Glass Ceiling Effect in Social Networks. Northeastren University. Boston, MA. USA.

Ps34. 2014: Axiomatic approach to core-periphery networks: implications to social and distributed computing. Google. New York, NY. USA.

Ps35. 2014: Homophily and the Emergence of a Glass Ceiling Effect in Social Networks. Weizmann Institute of Science, Israel.

Ps36. 2014: Homophily and the Emergence of a Glass Ceiling Effect in Social Networks. Ben Gurion University of the Negev, Israel.

Ps37. 2014: Homophily and the Emergence of a Glass Ceiling Effect in Social Networks. Google Research seminar, Tel-Aviv, Israel.

Ps38. * 2018: Data-Aware Network Design: Some Results and Open Questions. University of Vienna, Vienna, Austria.

Ps39. * 2019: Toward Demand-Aware Networks: Vision and Algorithms. Mellanox, Yokneam, Israel.

Ps40. * 2019: Homophily and the Emergence of a Glass Ceiling Effect in Social Networks. University of Cambridge, Cambridge, UK.

Ps41. * 2021: Cerberus: The Power of Choices in Datacenter Topology Design – A Throughput Perspective. Google networking seminar, Mountain View, CA. USA. (via Zoom)

Ps42. * 2022: Cerberus: The Power of Choices in Datacenter Topology Design – A Throughput Perspective. Microsoft, Cambridge, UK. (via Zoom)

Ps43. * 2022: Cerberus: The Power of Choices in Datacenter Topology Design – A Throughput Perspective. Hebrew University. Israel.

Research Grants

G1. 2008: GIF (German-Israeli Foundation) Young - **Chen Avin** (PI). The Road Not Taken - Random Walk with Choice for Wireless Networks Applications. Grant No. 2183-1807.6/2007. $\approx$ \$35K.

G2. 2009–2011. Magneton - The Office of the Chief Scientist of the Ministry of Industry, Trade & Labor, Israel. **Chen Avin** (PI) and Zvi Lotker (PI). Research and Feasibility Proof for Dynamic, Time Limited, Spontaneous Wireless Vehicular Networks Simulator. Grant No. 41902. Annual amount $\approx$ \$75K, total amount $\approx$ \$150K.

G3. 2011: Google's 2011 EMEA AndroidEDU Program - 7 Samsung Galaxy S plus phones. **Chen Avin** (PI).

G4. 2013: ISF 1549/13: **Chen Avin** (PI), Zvi Lotker (PI), David Peleg (PI). Structure, Dynamics and Algorithmics of Social Networks: An Axiom-Based Approach. Total amount $\approx \$280K$.

G5. 2014: GIF I-1245-407.6/2014: **Chen Avin** (PI), Stefan Schmid (PI), Feldmann Anja (CI). Yin-Yang Networking: Self-Adjusting Virtual Infrastructures. Total amount $\approx$ \$ $190K$.

G6. * 2018: ASU-BGU Projects in Strategic areas: **Chen Avin** (PI), Andrea Rica (PI). Self-Organized Cyber Defence in Networks: Algorithmic Foundations. Total amount $\$30K$

G7. * 2019: BGU Faculty of Engineering Award: **Chen Avin** (PI). Self-Adjusting Networked Systems: An Information-Theoretic Perspective. Total amount $\approx$ \$ $5K$.

G8. * 2019: Vice President and Dean for Research and Development Award for FET proposals: **Chen Avin** (PI). Self-Adjusting Optical Topologies for High-Performance Networking. Total amount $\approx$ \$ $5K$.

G9. * 2019: H2020, ERC-COG-2019 (5 years). Stefan Schmid (PI), **Chen Avin** (co). Self-Adjusting Networks - AdjustNet. Total amount $\approx$ €$1,670K$. For BGU $\approx$ €$325K$

G10. * 2020–2021. Magneton - The Office of the Chief Scientist of the Ministry of Industry, Trade & Labor, Israel. **Chen Avin** (PI), Gabriel Scalosub (PI), Gil Einziger (PI). Net Action: Network aware cache-based acceleration. Grant No. 71250. Annual amount $\approx$ \$120K, total amount $\approx$ \$240K.

Present Academic Activities

Articles under major/minor revision, second round of review:

S1. * **Chen Avin**[PI], Ingo van Duijn[PD], Stefan Schmid[PI]. Self-adjusting Linear Networks. Under revision in Information and Computation. 2020

Articles under review:

S3. * **Chen Avin**. Arithmetic Binary Search Trees: Static Optimality in the Matching Model. Submitted to Q2 Journal.

S4. **C. Avin**, M. Borokhovich, Y. Haddad, E. Kantor, Z. Lotker, M. Parter and D. Peleg. Generalized Perron–Frobenius Theorem for Multiple Choice Matrices and Applications

S5. * @ Chen Griner[S], Gil Einziger[PI], **Chen Avin**[PI]. Self-Adjusting Ego-Trees Network for Reconfigurable Datacenter Design. Submitted to $^{A^*}$ conference.

S6. * Johannes Zerwas[S], Csaba Györgyi[S], Andreas Blenk[PI], Stefan Schmid[PI], **Chen Avin**[PI]. Duo: A High-Throughput Reconfigurable Datacenter Network Using Local Routing and Control. Submitted to $^{A^*}$ conference.

S7. * @ Or Peres, **Chen Avin**. Demand-aware network design using the square root of graphs. Submitted to $^{A^*}$ conference.

S8. * Vamsi Addanki[S], **Chen Avin**[PI], Stefan Schmid[PI]. Mars: Near-Optimal Throughput with Shallow Buffers in Reconfigurable Datacenter Networks. Submitted to $^{A^*}$ conference.

S9. * Itamar Gozlan [S], **Chen Avin**[PI], Gil Einziger[PI], Gabriel Scalosub[PI]. Go-to-Controller is Better: Efficient and Optimal LPM Caching with Splicing. Submitted to $^{A^*}$ conference.

S10. * **Chen Avin**[PI], Hadassa Daltrophe[PI], Zvi Lotker[PI]. Breaking the Echo Chamber Effect in Social Media. Submitted.

Articles in preparation:

S7. * @ Raz Segal, **Chen Avin**, Gabriel Scalosub. In-network computing with bounded resources.

S8. * @ Elioz Geller, **Chen Avin**, Gabriel Scalosub. Online cooperative caching for high-speed datacenters networks.

Additional Information:

Organizing Committees and Chair at Conferences:

OC1. 2013: DISC - The International Symposium on DIStributed Computing. Organizing committee member.

OC2. 2014: DISC - The International Symposium on DIStributed Computing. Organizing committee member.

OC3. 2014: SSS - 16th International Symposium on Stabilization, Safety, and Security of Distributed Systems. Track Chair. Ad-hoc, Sensor and Mobile Networks, Cyberphysical Systems.

OC4. 2015: DISC - The International Symposium on DIStributed Computing. Organizing committee member.

OC5. 2015: SIROCCO - The 22nd International Colloquium on Structural Information and Communication Complexity. Organizing committee member.

OC6. 2016: PODC - The ACM Symposium on Principles of Distributed Computing. Organizing committee member.

OC7. * 2019: OptSys - ACM SIGCOMM 2019 Workshop on Optical Systems Design. Organizing and Program (Co-) Chair.

OC8. * 2019: DCC - The International Workshop on Distributed Cloud Computing. Organizing and Program (Co-) Chair

OC9. * 2020: OptSys - ACM SIGCOMM 2020 Workshop on Optical Systems Design. Organizing and Program (Co-) Chair.

OC10. * 2021: OptSys - ACM SIGCOMM 2020 Workshop on Optical Systems Design. Organizing and Program (Co-) Chair.

OC11. * 2021: Israeli Networking Day 2020. Program (Co-) Chair.

Program Committees at Conferences:

SC1. 2007: International Conference on Distributed Computing Systems. ICDCS 2007. Program committee member.

SC2. 2008: International Conference on Mobile Ad-hoc and Sensor Networks. MSN 2008. Program committee member.

SC3. 2009: International Workshop on Algorithms for Sensor Systems, Wireless Ad Hoc Networks and Autonomous Mobile Entities. Algosensors 2009. Program committee member.

SC4. 2009: IFIP Annual Mediterranean Ad Hoc Networking Workshop. Med-Hoc-Net'09. Program committee member.

SC5. 2010: International Conference on Mobile Ad-hoc and Sensor Networks. MSN 2010. Program committee member.

SC6. 2010: IFIP Annual Mediterranean Ad Hoc Networking Workshop. Med-Hoc-Net'10. Program committee member.

SC7. 2010: European Conference on Wireless Sensor Networks. EWSN-10. Program committee member.

SC8. 2010: IEEE International Conference on Distributed Computing in Sensor Systems. DCOSS 2010. **Publicity chair**.

SC9. 2011: IFIP Annual Mediterranean Ad Hoc Networking Workshop. Med-Hoc-Net'11. Program committee member.

SC10. 2012: FOMC - The Eighth ACM International Workshop on Foundations of Mobile Computing. Program committee member.

SC11. 2013: DISC - The International Symposium on DIStributed Computing. **Organizing** & Program committee member.

SC12. 2013: SIROCCO - International Colloquium on Structural Information and Communication Complexity. Program committee member.

SC13. 2014: DISC - The International Symposium on DIStributed Computing. **Organizing** & Program committee member.

SC14. 2015: DISC - The International Symposium on DIStributed Computing. **Organizing** committee member.

SC15. 2015: SIROCCO - The 22nd International Colloquium on Structural Information and Communication Complexity. **Organizing** committee member.

SC16. 2016: ESA - European Symposia on Algorithms. Program committee member.

SC17. * 2017: IPDPS - 31st IEEE International Parallel & Distributed Processing Symposium. Program committee member & leading reviewer.

SC18. * 2018: ICDCS - 38th IEEE International Conference on Distributed Computing Systems. Program committee member.

SC19. * 2019: SPAA - ACM Symposium on Parallelism in Algorithms and Architectures. Program committee member.

SC20. * 2020: ICCN - The 29th International Conference on Computer Communications and Networks. Program committee member.

SC21. * 2020: PODC - ACM Symposium on Principles of Distributed Computing. Program committee member.

SC22. * 2021: ICDCN - The 22nd International Conference on Distributed Computing and Networking. Program committee member.

SC23. * 2021: ASONAM - The IEEE/ACM International Conference on Advances in Social Network Analysis and Mining. Program committee member.

SC24. * 2022: ICDCN - The 23nd International Conference on Distributed Computing and Networking. Program committee member.

SC25. * 2022: ASONAM - The IEEE/ACM International Conference on Advances in Social Network Analysis and Mining. Program committee member.

Visiting Researchers

Vs1. 2008: Dr. Francesco Pasquale (Tor Vergata University of Rome, Italy)

Vs2. 2008-9: Dr. Yvonne-Anne Pignolet (ETH Zurich, Switzerland)

Vs3. 2011: PhD. Student, Bernhard Haeupler (MIT, USA)

Vs4. 2013: (long term visit) PhD. Student, Barbara Keller (ETH Zurich, Switzerland)

Vs5. 2009,11,13, 15, 16: Dr. Stefan Schmid (TU-Berlin, Germany)

Vs6. 2015: Prof. Robert Elsässer (University of Salzburg, Austria)

Vs7. 2016: Louis Cohen (M.Sc. student Normalien École Normale Supérieure de Cachan, France.)

Science Communication - General public talks and papers

P1. 2011: Why did you really start going to the gym? (Hebrew). **Chen Avin** and Zvi Lotker. TheMarker. Israeli Business Journal.

P2. 2011: Networked. The new science of networks. **Chen Avin**. FP7 "science night" talk at BGU.

P3. 2012: From Caesar to Twitter (Hebrew). **Chen Avin** and Zvi Lotker. TheMarker. Israeli Business Journal.

P4. 2012: From Turing to Zuckerberg: On the History of the Internet. **Chen Avin**. FP7 "science night" talk at BGU.

P5. 2013: Networked: On the Science of Networks Around Us. **Chen Avin**. A seminar at the class "Selected Topics in Science". BGU.

P6. 2015: On the Gender War in Social Networks. **Chen Avin**. "ScienceFest" night at BGU.

Member in graduate student committees

* Lin Miao. Ph.D., (ISE) Ben Gurion University of the Negev. 2022.
* Asaf Nadler. Ph.D., (ISE) Ben Gurion University of the Negev. 2021.
* Matan Zuckerman. M.Sc., (ISE) Ben Gurion University of the Negev. 2020.
* Stepan Zakharov. M.Sc., (ISE) Ben Gurion University of the Negev. 2020.
* Guy Rosenbereg. M.Sc., (CSE) Ben Gurion University of the Negev. 2020.
* Gal Morgenstern. Ph.D., (ECE) Ben Gurion University of the Negev. 2020.
* Barak Hagbi. Ph.D., (ISE) Ben Gurion University of the Negev. 2020.
* Itamar Cohen. Ph.D., (CSE) Ben Gurion University of the Negev. 2019.
* Bruna Soares Peres, Ph.D., (CS) Federal Univer- sity of Minas Gerais, Brazil. 2019
* Dimitri Kagan. Ph.D., (ISE) Ben Gurion University of the Negev. 2018.
* Ben Amos. M.Sc., (CSE) Ben Gurion University of the Negev. 2018.
* Chen Levi. M.Sc., (CSE) Ben Gurion University of the Negev. 2018.
* Jorge Bendahan. M.Sc., (ISE) Ben Gurion University of the Negev. 2018.
* Dimitri Kagan. M.Sc., (ISE) Ben Gurion University of the Negev. 2017.
* Liran Sidiki. M.Sc., (CSE) Ben Gurion University of the Negev. 2017.
* Kiril Danilchenko. M.Sc., (CSE) Ben Gurion University of the Negev. 2016.
Ohad Zadok. M.Sc, (CS) Ben Gurion University of the Negev. 2016.
Nadav Schweitzer. Ph.D, (ISE) Ben Gurion University of the Negev. 2015.
Vladimir Katz. M.Sc., (CSE) Ben Gurion University of the Negev. 2015.
Merav Parter, Ph.D., (CS) Weizmann Institute of Science. 2014.
Viktor Jabotinsky M.Sc., (CSE) Ben Gurion University of the Negev. 2014
Itzik Turkel, Ph.D., (CSE) Ben Gurion University of the Negev. 2014.
Ziv Goldfeld, Ph.D., (EE) Ben Gurion University of the Negev. 2014.

Yony Murin, Ph.D., (EE) Ben Gurion University of the Negev. 2014.
Michael Markovitch. M.Sc., (CSE) Ben Gurion University of the Negev. 2014.
Hadassa Daltrophe. Ph.D., (CS) Ben Gurion University of the Negev. 2013.
Jenia Feldman. M.Sc., (CSE) Ben Gurion University of the Negev. 2011.
Eyal Nussbaum. M.Sc., (CSE) Ben Gurion University of the Negev. 2011.
Kfir Damari. M.Sc., (CSE) Ben Gurion University of the Negev. 2011.
Nir Amira. M.Sc., (CSE) Ben Gurion University of the Negev. 2011.

Volunteering

V1. 2011–2015: First-Lego-League (FLL) Mentor - three times first place in the regional competitions in Israel.

Conferences Reviewer:

STOC, Infocom, ESA, SODA, STACS, ICALP, PODC, SIRROCCO, DISC, EWSN, Algosensors, MSN, SSS, IPDPS.

Personal:

Married, with three children.

Synopsis of research

1. Research Philosophy

My research lies at the intersection of systems and theory. I am motivated by real-life systems, their operations, and the problems and questions they present. I study them by assigning an appropriate abstract model and theoretically analyzing the properties of the model. My goal is to study the properties of these systems analytically to exploit them for the development of efficient algorithms. In particular, I am interested in distributed, complex, and dynamic systems whose structure can be explained by a network of connections (i.e., graphs) and in proving the properties of these graphs. I am intrigued by computer network systems such as datacenters, wireless sensor networks, the internet, and peer-to-peer networks. I study problems related to these networks, like routing, searching, and spreading information. I am also interested in the structure of networks and systems that result from the interaction between humans and computers, like the structure of (online) social networks and other social media. My research employs a multidisciplinary approach, and in particular, I have been using tools and results from mathematics, physics, game theory, electrical engineering, and computer science. I stand for teamwork and enjoy the enriching of collaboration, both within my research field and between fields.

2. Research plans for near future 2023–?

My research group main plans for the near future are to continue the current line of research I have been mostly involved in the recent years: i) Topology Engineering for Distributed Systems (Self-adjusting networks) and ii) In-network computing for machine learning. In addition to that I plan to pursue my research about social network and, in particular, regulation of social media.

2.1 Topology Engineering for Distributed Systems

The performance of many distributed systems and cloud applications, e.g., related to distributed machine learning, batch processing, or streaming, critically depends on the bandwidth capacity of the underlying network topology. Accordingly, over the last few years, significant efforts have been made to improve the throughput of datacenter networks which traditionally use static topologies with uniform and symmetric structures. However, static uniform topologies are inherently inefficient for carrying highly skewed, sparse, and dynamic traffic that is common in such networks.

In parallel, recent optical technologies enable ”topology engineering,” an innovative approach to improving datacenter performance by supporting dynamic and real-time reconfigurations of the physical network topology. Reconfigurable networks and topology engineering are emerging as a cornerstone in making modern networks more efficient and come in two flavors: oblivious and demand-aware. While oblivious reconfigurable topologies rely on quickly and periodically changing interconnects that usually emulate a complete graph, demand-aware topologies allow optimizing topological shortcuts that depend on the traffic pattern but at the cost of a higher reconfiguration time. However, there is little consensus in the networking community on how these different designs and approaches fare against each other. Moreover, we currently lack a basic agreement on a unified model, formal metrics, and analytical tools to study topology engineering rigorously.

My line of research aims to make significant progress toward closing this gap. We plan to provide theoretical guarantees and an understanding of essential metrics like the throughput of reconfigurable topologies and propose algorithms, network architectures, and protocols to improve state-of-the-art topology engineering. In particular, we propose evolving graphs as a unified model for topology engineering. Evolving graphs can model static and demand-oblivious topologies like expanders, dynamic and demand-oblivious topologies, and dynamic and demand-aware. Moreover, such a unified model will enable us to propose and evaluate hybrid networks that may combine different types of dynamics. Our main conjecture is that *dynamic hybrid topologies* will have asymptotically better throughput than a comparable static (or non-hybrid) topology. In the coming years we aim to prove this conjecture. Furthermore, we plan to study efficient routing for reconfigurable topologies and distributed algorithms for topology engineering. These are also novel problems; therefore, we believe our line of work will significantly advance this field of research.

At large, it is still an open question if dynamic demand-aware networking for the physical layer, i.e., the network topology (compared with demand-oblivious designs), is better or worthwhile. My central research hypothesis is that it is, and my research goal is to provide a theoretical framework and tools to prove it. Since our line of research is novel and tries to combine systems (networking) with theoretical results, it is still an ongoing effort to make a significant impact on both communities, but I believe it will reach there.

2.2 In-network computing for machine learning

This is an initial on-going work. The main hypothesis in this line of research is that distributed machine learning will require unique networking features to continue to scale. Our initial work on the topic includes two publication at top conference [C64, C67]

3. Previous Research Achievements

My main research contribution can be divided into five topics: 1) demand-aware and self-adjusting networks, 2) social networks, 3) random walks and randomized algorithms for networks, 4) Algorithmica of SINR and 5) Information spreading in (dynamic) networks.

3.1 Demand-aware and self-adjusting networks.

Self-adjusting networks is my most active research area in recent years, and I have published more than *35 papers* on the topic. My first work on the topic was in 2011 with my Ph.D. student and a Ph.D. student from MIT I hosted for that summer [C32]. Later on, I joined forces with Prof. Schmid, and we won a GIF grant on the topic [G5] and, more recently, an ERC on the topic [G9]. This work started as theoretical work for peer-2-peer networks, but in recent years gained more popularity as new optical technologies enabled us to use our ideas for datacenter networks. At large, it is still an open question whether demand-aware networking for the physical layer, i.e., the network topology (compared with demand-oblivious designs), is better or worthwhile. Our central research hypothesis is that it is, and my research goal is to provide a theoretical framework and tools to prove it. I recently gave talks about the topic in Google (Mountain View, CA. USA.) [Ps41] and Microsoft (Cambridge, UK) [Ps42] networking seminars. My publications on the topic include A^* conferences and $Q1$ journals. Several significant contributions and publications are: (i) an overview of the problem and taxonomy [J26], (ii) using self-adjusting data structure like a splay tree to get provable results for networks [J20], (iii) providing entropy-based lower bound for the demand-aware network design problem [C47, J31, J37], (iv) defining *trace complexity* [C60], (v) proposing Cerberus, a novel throughput efficient datacenter design [C66], and (vi) studying the distributed version of the network design problem [C56,C70]. A complete list of publications is on my homepage .

3.2 Social networks analysis.

I have worked on this topic since my Ph.D. studies, and we had an ISF grant until 2018. Our research included some significant and novel contributions. In particular, on Elite and Periphery structure in social networks [J27], Homophily and the glass ceiling effect in social networks [J33], and the connection between random walks and preferential attachment [C49]. (i) Core-periphery structure: In many societies, there is an *elite*, a relatively *small* group of *powerful* individuals that is *well connected* and highly *influential*. From the ancient days of Julius Caesar's senate of Rome to the recent days of celebrities on Twitter, the size of the elite is a result of conflicting social forces competing to increase or decrease it. The main contribution of this work [J27] is the answer to the question *how large the elite is at equilibrium*. We take an *axiomatic approach* to solve this: assuming that an elite exists and it is *dominate*, *robust*, *minimal* and *dense*, we prove that its size must be sublinear in the number of nodes. We then continued and showed that such a structure has strong algorithmic implications for distributed computing [C35, J24], and also offered a model that leads to such a structure C37. This line of research leads to a significant improvement in analyzing well-known social network models like preferential attachment. This result was presented KDD-17 [C45]. (ii) Homophily and minorities in networks: In this line of work, we were the first to analytically study the phenomenon of the "glass ceiling" in social networks [C36, C42]. We proposed a new model that can provide an initial explanation for this disturbing effect, with evidence of its existence in academia and, in particular, in the CS community concerning gender (female minority). We continued this line of research by extending the above results to more general settings [J33], including a game theoretic perspective for this problem as well [C44].

3.3 Random Walk Techniques for Information Processing in (Wireless) Networks

This line of work started with my Ph.D. It continued during my early days at BGU. Overall I published about 27 papers on this topic. Randomized algorithms, like random walks and gossip algorithms, offer a simple, local, and distributed solution for information spreading in dynamic (wireless) networks. In a sequence of joint papers [C2, C3, C6, C7, J2, J7, J4, C8, C9, J5, C10, C17, J8, C19] I investigated the efficiency of these approaches for networks and distributed systems, both theoretically and in practice. Surprisingly, we show that despite their simplicity, random-walk-based algorithms are competitive with other approaches. Therefore, in recent years, these algorithms began to gain popularity in the networking community and have been proposed for various networks and networking protocols, including searching, routing, self-stabilization, and query processing in wireless networks, peer-to-peer networks, and other distributed systems.

Our work on the topic includes some novel contributions like studying the cover time of multiple random walks [C9, J9], random walks in dynamic networks [C8] and hypergraphs [J16], and random walk with the power of choice [J5]. There are hundreds of citations for my research on the subject, including papers that explicitly answer open questions. Over the years, I have presented this work at many universities and conferences. This work was partially supported by my GIF Young grant [G1].

3.4 Algorithmica of Signal to Interference & Noise Ratio (SINR)

In a wireless network, deciding whether a transmission by a station s is successfully received by another station s' depends nontrivially on the positioning and activities of s, s' and nearby stations. The rules governing the availability and quality of wireless connections can be described by *physical* models such as the *signal-to-interference & noise ratio (SINR)* model. The study of SINR in the context of networking protocol has gained much attention recently and in a sequence of papers published in leading conferences and journals [C13, C15, C14, J12, C25, C29, J22, J23] we studied the SINR model from new perspectives. In a major work, we proposed to use the **SINR diagram** to describe the *reception zones* of simultaneously transmitting stations. SINR diagrams appear to be fundamental to understanding the dynamics of wireless networks, and may play a key role in the development of suitable algorithmics for such networks, analogous perhaps to the role played by Voronoi diagrams in computational geometry. This work was published in JACM [J12].

3.5 Information spreading in (dynamic) networks.

The hypothesis that randomized protocols offers a simple and scalable solution for information spreading in large-scale dynamic network is at the core of my research. We have analyzed the use of *network coding* [C18, C20, C26, J14, J15] in *gossip protocols* to achieve the capacity of the network in an efficient way as well as other models of gossip [C33]. The most recent work on the topic, addressing network coding and correlated data, was published in IEEE Journal on Selected Areas in Communications (JSAC) [J19]. In [C40] we made initial progress in understanding the power of network coding vs. (the more traditional) store and forward approach, in particular for dynamic networks.