Aviv Adler

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Current Position

2023–Present | Postdoctoral Scholar, **University of California, Berkeley**
- AUTOLAB, Electrical Engineering and Computer Science (EECS)
- Advisor: Ken Goldberg

Education

Feb 2023 | **Massachusetts Institute of Technology**, Cambridge, MA
Ph.D in Electrical Engineering and Computer Science
- Advisor: Sertac Karaman
- Thesis Title: The Traveling Salesman Problem Under Dynamic Constraints

Jun 2017 | S.M in Electrical Engineering and Computer Science

Jun 2014 | **Princeton University**, Princeton, NJ
B.A. in Mathematics

Research Interests

Algorithmic problems in robotics, with a focus on methods based on optimization, graph theory, and computational geometry, either on their own or in conjunction with machine learning techniques; algorithms for autonomous agents; probability theory and stochastic processes; information theory.

Publications

Conference

- Jennifer Tang, Aviv Adler, Amir Ajorlou, and Ali Jadbabaie. "Convergence of Opinion Dynamics under Social Pressure for General Networks". In: *To appear at IEEE Conference on Decision and Control (CDC) 2023*
- Varun Kamat, Viraj Ramakrishnan, Yashish Mohnot, Harshika Jalan, Julia Isaac, Vincent Schorp, Yahav Avigal, Aviv Adler, Danyal M Fer, and Ken Goldberg. "Automating 2D Suture Placement". In: *2023 IEEE 19th International Conference on Automation Science and Engineering (CASE)*. IEEE. 2023, pp. 1–8 **(Best Student Paper Award)**
- Shrey Aeron, Edith Llontop, Aviv Adler, Wisdom C Agboh, Mehmet Dogar, and Ken Goldberg. "Push-MOG: Efficient Pushing to Consolidate Polygonal Objects for Multi-Object Grasping". In: *2023 IEEE 19th International Conference on Automation Science and Engineering (CASE)*. IEEE. 2023, pp. 1–6
- Aviv Adler, Jennifer Tang, and Yury Polyanskiy. "Efficient Representation of Large-Alphabet Probability Distributions via Arcsinh-Compander". In: *2022 IEEE International Symposium on Information Theory (ISIT)*. 2022, pp. 162–167

- Aviv Adler, Jennifer Tang, and Yury Polyanskiy. "Quantization of Random Distributions under KL Divergence". In: *2021 IEEE International Symposium on Information Theory (ISIT)*. IEEE. 2021, pp. 2762–2767
- Aviv Adler, David Miculescu, and Sertac Karaman. "Optimal policies for platooning and ride sharing in autonomy-enabled transportation". In: *Algorithmic Foundations of Robotics XII: Proceedings of the Twelfth Workshop on the Algorithmic Foundations of Robotics*. Springer. 2020, pp. 848–863
- Aviv Adler, Jeffrey Bosboom, Erik D Demaine, Martin L Demaine, Quanquan C Liu, and Jayson Lynch. "Tatamibari is NP-complete". In: *arXiv preprint arXiv:2003.08331* (2020)
- Aviv Adler, Erik D Demaine, Adam Hesterberg, Quanquan Liu, and Mikhail Rudoy. "Clickomania is hard, even with two colors and columns". In: *The Mathematics of Various Entertaining Subjects: Research in Games, Graphs, Counting, and Complexity, Volume 2* 2 (2017), p. 325
- Aviv Adler and Sertac Karaman. "The stochastic traveling salesman problem and orienteering for kinodynamic vehicles". In: *2016 IEEE International Conference on Robotics and Automation (ICRA)*. IEEE. 2016, pp. 2788–2795
- Aviv Adler, Mark De Berg, Dan Halperin, and Kiril Solovey. "Efficient multi-robot motion planning for unlabeled discs in simple polygons". In: *Algorithmic Foundations of Robotics XI: Selected Contributions of the Eleventh International Workshop on the Algorithmic Foundations of Robotics*. Springer. 2015, pp. 1–17
- Aviv Adler, Michael Biro, Erik D Demaine, Mikhail Rudoy, and Christiane Schmidt. "Computational complexity of numberless Shakashaka." In: *CCCG*. 2015
- Fatemeh Panahi, Aviv Adler, and A Frank van der Stappen. "Pose statistics for eccentric parts". In: *2015 IEEE International Conference on Automation Science and Engineering (CASE)*. IEEE. 2015, pp. 580–585
- Fatemeh Panahi, Aviv Adler, A Frank van der Stappen, and Ken Goldberg. "An efficient proximity probing algorithm for metrology". In: *2013 IEEE International Conference on Automation Science and Engineering (CASE)*. IEEE. 2013, pp. 342–349

Journal

- Aviv Adler, Oscar Mickelin, Ragesh K Ramachandran, Gaurav S Sukhatme, and Sertac Karaman. "The Role of Heterogeneity in Autonomous Perimeter Defense Problems". In: *To appear in: International Journal of Robotics Research*. 2023
- Aviv Adler, Jennifer Tang, and Yury Polyanskiy. "Efficient Representation of Large-Alphabet Probability Distributions". In: *IEEE Journal on Selected Areas in Information Theory* 3.4 (2022), pp. 651–663
- Aviv Adler, Mark de Berg, Dan Halperin, and Kiril Solovey. "Efficient Multi-Robot Motion Planning for Unlabeled Discs in Simple Polygons". In: *IEEE Transactions on Automation Science and Engineering* 12.4 (2015), pp. 1309–1317
- Aviv Adler, Fatemeh Panahi, A Frank van der Stappen, and Ken Goldberg. "Efficient proximity probing algorithms for metrology". In: *IEEE Transactions on Automation Science and Engineering* 12.1 (2014), pp. 84–95
- Aviv Adler and Ilan Adler. "Fundamental Transformations of Sudoku Grids". In: *Mathematical Spectrum* 41.1 (2008), p. 2009 **(Best Student Paper of the Year)**

Preprint

- Jennifer Tang, Aviv Adler, Amir Ajorlou, and Ali Jadbabaie. *Estimating True Beliefs from Declared Opinions*. 2023. arXiv: 2310.17171 [eess.SY]
- Aviv Adler et al. *The Teenager's Problem: Efficient Garment Decluttering With Grasp Optimization*. 2023. arXiv: 2310.16951 [cs.RO]
- Jennifer Tang, Aviv Adler, Amir Ajorlou, and Ali Jadbabaie. *Stochastic Opinion Dynamics under Social Pressure in Arbitrary Networks*. 2023. arXiv: 2308.09275 [eess.SY]
- Aviv Adler, Oren Gal, and Sertac Karaman. *Agility and Target Distribution in the Dynamic Stochastic Traveling Salesman Problem*. 2023. arXiv: 2302.00243 [cs.RO]
- Aviv Adler, Joshua Ani, Lily Chung, Michael Coulombe, Erik D Demaine, Yevhenii Diomidov, Dylan Hendrickson, and Jayson Lynch. "This Game Is Not Going To Analyze Itself". In: *arXiv preprint arXiv:2302.01145* (2023)

Awards and Honors

2013	Melvin Morris Goldberg Fellowship for Research in Israel
2008	Best Student Paper of the Year, *Mathematical Spectrum*

Teaching Experience

Fall 2022	**Teaching Assistant for 6.7900: Machine Learning**, MIT *Prepared and gave recitations; held office hours and answered student questions online; prepared and graded homework and exams* Teaching Evaluations: Average 6.4/7.0, Median 6.5/7.0
Fall 2018	**Teaching Assistant for 6.436/15.085: Fundamentals of Probability**, MIT *Prepared and gave recitations; held office hours and answered student questions online; prepared and graded homework and exams* Teaching Evaluations: Average 5.5/7.0, Median 6.0/7.0

Industry Experience

Summer 2012	**Siemens Corporate Research** *Research Intern* Developed and tested software for autmoatically tracking changes in documents
Summer 2010	**Nomis Solutions** *Research Intern* Researched the Canadian mortgage market; developed and tested customer behavior models to study price optimization

University and Professional Service

2023	Toyota Research Institute (TRI) sponsor coordinator for AUTOLAB
2015-2023	Reviewer of 40+ conference and journal papers, including for: • IEEE International Conference on Robotics and Automation (ICRA) • IEEE Conference on Automation Science and Engineering (CASE) • IEEE International Conference on Intelligent Robots and Systems (IROS) • International Workshop on Algorithmic Foundations of Robotics (WAFR) • Robotics Science and Systems (RSS) • IEEE Conference on Decision and Control (CDC) • American Control Conference (ACC) • Neural Information Processing Systems (NeurIPS) • IEEE Robotics and Automation Letters (RA-L) • IEEE Transactions on Robotics (TR-O) • Discrete Optimization
2018	MIT Theory Retreat, Chief Organizer
2017	MIT Theory Retreat, Safety Officer