Doron Haviv

PhD Candidate at the Dana Pe'er Lab, Memorial Sloan Kettering Cancer Center

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EDUCATION

Memorial Sloan Kettering Cancer Center Joint with Weill Cornell Medicine and Cornell University July 2019 —

Ph.D. in Computational Biology and Medicine

Research Advisor: Dana Pe'er

Technion - Israel Institute of Technology October, 2014 — October, 2018

B.Sc. Electrical Engineering (*cum laude*)

B.Sc. Physics (*cum laude*)

Research Advisor: Omri Barak

Thesis: Understanding and Controlling Memory in Recurrent Neural Networks.

***Graduated at 19 years-old**

RESEARCH INTERESTS

machine learning, single-cell genomics, optimal transport, spatial transcriptomics

PUBLICATIONS AND PRE-PRINTS

Haviv, D.*, Pooladian, A.A.*, Pe'er, D., Amos, B. 2024. Wasserstein Flow Matching: Generative modeling over families of distributions. In review.

Haviv, D., Kunes, R.Z., Dougherty, T. Burdziak, C., Nawy T., Gilbert A., Pe'er, D. 2024. Wasserstein Wormhole: Scalable Optimal Transport Distance with Transformers. Proceedings of the 41st International Conference on Machine Learning, PMLR 235:17697-17718.

Haviv, D., Remšík, J., Gatie, M., Snopkowski, C., Takizawa, M., Pereira, N., ..., Pe'er, D. 2024. The covariance environment defines cellular niches for spatial inference. Nature Biotechnology, 1-12.
Highlighted in *Nature Biotechnology Research Briefing

Mani, S.*, Haviv, D.*, Kunes, R., Pe'er, D. 2022. SPOT: Spatial Optimal Transport for Analyzing Cellular Microenvironments. In NeurIPS 2022 Workshop on Learning Meaningful Representations of Life.
***Spotlight Presentation**

Elad, A.*, Haviv, D.*, Blau, Y. and Michaeli, T., 2019. Direct validation of the information bottleneck principle for deep nets. In Proceedings of the IEEE/CVF International Conference on Computer Vision Workshops.
***Best poster award Statistical Deep Learning in Computer Vision Workshop**

Haviv, D., Rivkind, A. and Barak, O., 2019. Understanding and controlling memory in recurrent neural networks. Proceedings of the 36th International Conference on Machine Learning, PMLR 97:2663-2671.

Kunes, R.Z., Yin, M., Land, M., Haviv, D., Pe'er, D. and Tavaré, S., 2023, June. Gradient estimation for binary latent variables via gradient variance clipping. In Proceedings of the AAAI Conference on Artificial Intelligence (Vol. 37, No. 7, pp. 8405-8412).

Burdziak, C.*, Zhao, C. J.*, Haviv, D., Alonso-Curbelo, D., Lowe, S. W., Pe'er, D. 2023. scKINETICS: inference of regulatory velocity with single-cell transcriptomics data. Bioinformatics, 39(39 Suppl 1), i394–i403.
***Best paper award Intelligent Systems for Molecular Biology (ISMB) 2023.**

Burdziak, C.*, Alonso-Curbelo, D.*, Walle, T., Reyes, J., Barriga, F. M., Haviv, D., Xie, Y., Zhao, Z., Zhao, C. J., Chen, H.-A., Chaudhary, O., Masilionis, I., Choo, Z.-N., Gao, V., Luan, W., Wuest, A., Ho, Y.-J., Wei, Y., Quail, D. F., ... Pe'er, D. 2023. Epigenetic plasticity cooperates with cell-cell interactions to direct pancreatic tumorigenesis. Science, 380(6645), eadd5327.
***Highlighted in *Cancer Discovery*, *Nature Reviews Gastroenterology and Hepatology*, *Cell Trends in Cancer*, and EACR Highlights in Cancer Research.**

Raayoni, G., Gottlieb, S., Manor, Y., Pisha, G., Harris, Y., Mendlovic, U., Haviv, D., Hadad, Y. and Kaminer, I., 2021. Generating conjectures on fundamental constants with the Ramanujan Machine. Nature, 590(7844), pp.67-73.
Highlighted in *New Scientist

AWARDS AND HONORS

Best Poster Award, SDL-VC workshop, International Conference on Computer Vision 2019
Yehoraz Kasher Prize **Best Student Project in Electrical Engineering, 3rd Place** 2018
Technion - Israel Institute Of Technology **President's List** 2018
Technion - Israel Institute Of Technology **Dean's List** 2017
Technion - Israel Institute Of Technology **Dean's List** 2016

INVITED AND CONTRIBUTED TALKS

Apple Machine Learning Research Group, Virtual 2024
Invited Talk: *Wasserstein Wormhole: Scalable Optimal Transport Distance with Transformers.*

scverse Community Meeting, Virtual 2024
Invited Talk: *Reconstructing spatial context for single cell transcriptomics with ENVI*

Department of Computer Science Colloquium, Columbia University, New York, New York, USA 2024
Invited Talk: *Reconstructing spatial context for single cell transcriptomics with ENVI*

Ido Amit Lab, Weizmann Institute of Science, Rehovot, Israel 2024
Invited Talk: *Reconstructing spatial context for single cell transcriptomics with ENVI*

10x Spatial World Tour, New York Genome Center, New York, New York, USA 2023
Invited Talk: *Reconstructing spatial context for single cell transcriptomics with ENVI*

The Jackson Laboratory for Genomic Medicine, Farmington, Connecticut, USA 2022
Invited Talk: *Reconstructing spatial context for single cell transcriptomics with ENVI*

Fusion Conference on Probing Human Disease using Single-Cell Technologies, Cancun, MX 2022
Contributed Talk: *Spatial Context of Heterogenous T Cell Response to Fungal Insult.*

International conference on machine learning. Long Beach, California, USA 2019
Contributed Talk: *Understanding and controlling memory in recurrent neural networks*

TEACHING AND MENTORSHIP

Intern Mentor, Dana Pe'er Lab, Memorial Sloan Kettering Cancer Center
Shouvik Mani, Spatial Optimal Transport for analyzing cellular microenvironments 2022
Yasa Baig, Discrete latent models for interpretable single-cell analysis 2021

Teaching Assistant, Technion - Israel Institute Of Technology, 2018-2019
Introduction to Biological Systems and Signals, Head TA
Electromagnetic Fields

REVIEWING

- **Journals**: Nature Biomedical Engineering, Nature Biotechnology, Cell, Genome Biology
- **Conferences**: NeuRIPS, ICLR, ICML, ICML Workshop in Computational Biology