

# Doron Haviv

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

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## EDUCATION

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**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

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

## PUBLICATIONS AND PRE-PRINTS

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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. arXiv preprint arXiv:2404.09411.

**Accepted to ICML2024**

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 (pp. 0-0).

**\*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. In International conference on machine learning (pp. 2663-2671). PMLR.

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

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

## INVITED AND CONTRIBUTED TALKS

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<i>scverse</i> Community Meeting, Virtual	2024
<b>Invited Talk:</b> <i>ENVI - Reconstructing spatial context for single cell transcriptomics</i>	
Department of Computer Science Colloquium, Columbia University, New York, New York, USA	2024
<b>Invited Talk:</b> <i>ENVI - Reconstructing spatial context for single cell transcriptomics</i>	
Ido Amit Lab, Weizmann Institute of Science, Rehovot, Israel	2024
<b>Invited Talk:</b> <i>ENVI - Reconstructing spatial context for single cell transcriptomics</i>	
10x Spatial World Tour, New York Genome Center, New York, New York, USA	2023
<b>Invited Talk:</b> <i>ENVI - Reconstructing spatial context for single cell transcriptomics</i>	
The Jackson Laboratory for Genomic Medicine, Farmington, Connecticut, USA	2022
<b>Invited Talk:</b> <i>ENVI - Reconstructing spatial context for single cell transcriptomics</i>	
Fusion Conference on Probing Human Disease using Single-Cell Technologies, Cancun, MX	2022
<b>Contributed Talk:</b> <i>Spatial Context of Heterogenous T Cell Response to Fungal Insult.</i>	
International conference on machine learning. Long Beach, California, USA	2019
<b>Contributed Talk:</b> <i>Understanding and controlling memory in recurrent neural networks</i>	

## TEACHING AND MENTORSHIP

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Intern Mentor, Dana Pe'er Lab, Memorial Sloan Kettering Cancer Center	
<b>Shouvik Mani</b> , Spatial Optimal Transport for analyzing cellular microenvironments	2022
<b>Yasa Baig</b> , 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**

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- NeuRIPS
- ICML Workshop in Computational Biology