Aviv Ratzon

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Objective

PhD student in Computational and Theoretical Neuroscience (Technion, expected 2026). Interested in representational drift, noisy learning, and forming of representations. Seeking a postdoc bridging theory and neurotechnology.

Education

- **Technion - Israel Institute of Technology** *Oct 2020 – Present (Expected May 2026)*
  Direct PhD, Computational & Theoretical Neuroscience, Advisors: ***Omri Barak*** *and* ***Dori Derdikman*** Haifa, Israel
  - Thesis title: Leveraging Representational Drift to Peek Into the Brain's Learning Algorithm.
  - Developed and applied models to analyze sparse, high-dimensional, and noisy time-series data for neural recordings.
  - Investigated the dynamics of stochastic systems and noisy learning processes in abstract models (e.g., feedforward/recurrent networks).
- **Technion - Israel Institute of Technology** *Oct 2016 – Oct 2020*
  BSc, Electrical Engineering Haifa, Israel
  - Specializations: Machine Learning, Signal Processing, Control, Biological Signal Processing

Publications

[1] **Ratzon, A**., Barak, O. (2025). **Multi-step Predictive Coding Leads To Simplicity Bias**. *arxiv*

[2] **Ratzon, A.**, Derdikman, D., Barak, O. (2024). **Representational drift as a result of implicit regularization**. *eLife*

[3] Khatib, D., **Ratzon, A.**, Sellevoll, M., Barak, O., Morris, G., Derdikman, D (2023). **Experience, not time, determines representational drift in the hippocampus**. *Neuron*

Conferences

- **Contributed Talks:** Bernstein 2022, Janelia 2023
- **Posters:** ISFN 2022, Cosyne 2023, iNav 2024, KISN 2024, ISFN 2025,
- **Summer Schools:** Neurobridges 2022, TECT 2023

Honors and Awards

- **Feinsod Award: Neurology and Brain Sciences** *2025*
- **Gutwirth Excellence Scholarship** *2024*
- **Faculty Excellence Scholarship** *2024*

Teaching

- **Teaching Assistant - Bioinformatics and Genomics in Medicine** *2025*
  - Introduction to Machine Learning methods in medical research and analysis methods for genomic data.
- **Teaching Assistant - Quantitative Methods for Medical Students** *2021-2024*
  - Teaching first-year medical students various subjects such as frequency domain analysis, regression, programming, dynamical systems, dimensionality reduction, algebra, etc.
- **Teaching Assistant - Physical Chemistry Course** *2024*
  - Tutorials on differential and integral calculus.
- **Teaching Assistant - ISFN Data Analysis Workshop** *2022*
  - Designed a short data analysis project for calcium imaging data.

Experience

- **Qualcomm** *2019 - 2020*
  Chip design verification, student position Haifa, Israel
- **Qualitest** *2015 - 2019*
  QA Engineer Yokneam, Israel
- **Kidum** *2015*
  Psychometric (SAT equivalent) Teacher Haifa, Israel

Skills

- **Programming:** Python (NumPy, Pandas, PyTorch), C/C++, Matlab, VHDL
- **Quantitative Methods:** Probability theory, stochastic processes, optimization, Monte Carlo simulation, linear algebra, regression, signal processing
- **Tools:** Git, Linux, LaTeX
- **Languages:** Hebrew (native), English (fluent), German (basic)