

Aviv Ratzon

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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 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*
- [1] **Ratzon, A., Derdikman, D., Barak, O. (2024). Representational drift as a result of implicit regularization.** *eLife*
- [2] **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.
 - Oral tests, writing home assignments and exam questions.
- **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.
 - Supervised a group of students with diverse backgrounds and guided them through the project.

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)