

Zvi N. Roth

Curriculum Vitae

Research

2024-present	Principal Investigator , Lab of Brain Representations, Gonda Brain Research Center, Bar-Ilan University
2023-2024	Research Fellow , School of Psychological Sciences, Faculty of Social Sciences, Tel Aviv University
2021-2023	Research Fellow , Laboratory of Brain and Cognition, National Institute of Mental Health, NIH
2016-2021	Postdoctoral Fellow , Laboratory of Brain and Cognition, PI: Dr. Elisha Merriam, National Institute of Mental Health, NIH
2009-2016	Graduate student , Neurobiology Dept. & ELSC, PI: Prof. Ehud Zohary, Hebrew University of Jerusalem
2008-2009	Undergraduate student , Racah Institute of Physics & ELSC, PI: Prof. Haim Sompolinsky, Hebrew University of Jerusalem

Education

2018	Summer Course , Computational Neuroscience: Vision, Cold Spring Harbor Laboratory, NY
2009-2017	Ph.D. Program in Brain Sciences: Computation and Information Processing, ELSC, Hebrew University of Jerusalem. PhD Thesis: <i>Brain Representations of Visual Percepts</i>
2008	Ulpanat De Shalit Summer School – Physics, Weizmann Institute, Rehovot
2006-2009	BSc. in Physics and Computer Science, Hebrew University of Jerusalem

Awards

2022	NIH Fellows Award for Research Excellence 2023
2019	NIMH Intramural Research Program OFT Trainee Travel Award
2019	VSS 2019 National Eye Institute Postdoctoral Travel Award
2016-2017	ELSC Postdoctoral Fellowship Abroad scholarship
2016	ELSC Prize for the first scientific paper based on data collected from the SKYRA magnet
2014	ELSC Prize for Outstanding Academic Performance 2013-2014 for published paper
2007	Dean's list, Faculty of Science, Hebrew University of Jerusalem

Peer-reviewed Journal Papers

* Denotes equal contribution

- Steinberg NJ*, **Roth ZN***, Movshon JA, Merriam EP. Neural basis of the double drift illusion. *Elife*. 2024 May 29;13:e76803.
- Kim JH, Yin C, Merriam EP, **Roth ZN**. Pupil Size Is Sensitive to Low-Level Stimulus Features, Independent of Arousal-Related Modulation. *eNeuro*. 2023 Oct 18;10(10)
- **Roth ZN**, Merriam EP. Representations in human primary visual cortex drift over time. *Nat Commun*. 2023 Jul 21;14(1):4422.
- **Roth ZN**, Kay K*, Merriam EP*. Natural scene sampling reveals reliable coarse-scale orientation tuning in human V1. *Nat Commun*. 2022 Oct 29;13(1):6469.
- Burlingham CS, Ryoo M, **Roth ZN**, Mirbagheri S, Heeger DJ, Merriam EP. Task-related hemodynamic responses in human early visual cortex are modulated by task difficulty and behavioral performance. *Elife*. 2022 Apr 7;11:e73018.
- Steinberg NJ*, **Roth ZN***, Merriam EP. Spatiotopic and retinotopic memory in the context of natural images. *J Vis*. 2022 Mar 2;22(4):11.
- **Roth ZN**, Ryoo M, Merriam EP. Task-related activity in human visual cortex. *PLoS Biol*. 2020 Nov 6;18(11):e3000921.
- **Roth ZN**, Heeger DJ, Merriam EP. Stimulus vignetting and orientation selectivity in human visual cortex. *Elife*. 2018 Aug 14;7:e37241.
- **Roth ZN**. Functional MRI Representational Similarity Analysis Reveals a Dissociation between Discriminative and Relative Location Information in the Human Visual System. *Front Integr Neurosci*. 2016 Mar 30;10:16

- **Roth ZN**, Zohary E. Fingerprints of Learned Object Recognition Seen in the fMRI Activation Patterns of Lateral Occipital Complex. *Cereb Cortex*. 2015 Sep;25(9):2427-39.
- **Roth ZN**, Zohary E. Position and Identity Information Available in fMRI Patterns of Activity in Human Visual Cortex. *J Neurosci*. 2015 Aug 19;35(33):11559-71.

Book Chapter

- **Roth ZN**, Merriam EP, Knapen T. Sensory modeling: Understanding computation in sensory systems through image-computable models. In *Computational and Network Modeling of Neuroimaging Data*, 2024 Jan 1 (pp. 31-52). Academic Press.

Invited Lectures

- **Perception Lunch, University of Minnesota**, 25 January 2022 (Zoom). *Orientation selectivity and fMRI redux: what are we actually measuring?*
- **Informal Center for Perceptual Systems (CPS) Seminar, The University of Texas at Austin**, 14 September 2022. *Orientation selectivity and fMRI redux: what are we actually measuring?*

Conference Lectures

- **Roth, Z.N.**, Kay, K., Merriam, E.P. (2022), *Orientation selectivity in human V1 revisited*. Vision Sciences Society annual meeting.
- **Roth, Z.N.**, Ryoo, M., Merriam, E.P. (2020), *Widespread task-related fMRI responses in visual cortex*. Israel Society for Neuroscience (ISFN) 28th Meeting.
- Huber, L., Merriam, E.P., Kim, I., Chai, Y., Kashyap, S., Polimeni, J.R., **Roth, Z.**, Shim, W.M., Kim, S.G., Ivanov, D. and Poser, B., (2019), *Measuring layer-dependent CBV fMRI in the visual system*. ISMRM 27th Annual Meeting & Exhibition. In *Proc Intl Soc Mag Reson Med* (p. 0399).
- **Roth, Z.N.**, Heeger, D.J., & Merriam, E.P. (2018), *Orientation selectivity and stimulus vignetting in human visual cortex*. Vision Sciences Society annual meeting. *Journal of Vision*, 18(10), 1052-1052.
- **Roth, Z.N.**, & Zohary, E. (2016). *Location and Identity Information Carried by fMRI Activation Patterns in Human Visual Cortex*. ELSC Ein Gedi Retreat.
- **Roth, Z.N.**, & Zohary, E. (2015). *Location and identity information carried by fMRI activation patterns in human visual cortex*. ISFN 24th Meeting.
- **Roth, Z.**, & Zohary, E. (2012). *Learning to recognize degraded objects is associated with a greater match to the objects' template patterns in lateral occipital cortex*. Israel Society for Neuroscience (ISFN) 21st Meeting.

Conference Posters

- **Roth, Z.N.**, & Merriam, E.P. (2025). *Representational drift and repetition suppression: identical or distinct phenomena?*. Vision Sciences Society annual meeting.
- Kim, J.H., Yin C., Merriam, E.P., **Roth, Z.N.** (2022), *Pupil size is sensitive to low-level features, independent of arousal-related modulation*. Vision Sciences Society annual meeting.
- **Roth, Z.N.**, Heeger, D.J., & Merriam, E.P. (2020), *Stimulus vignetting and orientation selectivity in human visual cortex*. Israel Society for Neuroscience (ISFN) 28th Meeting.
- **Roth, Z.N.**, Steinberg, N.J., Merriam, E.P. (2019), *Spatiotopic memory is more precise than retinotopic memory in the context of natural images*. Vision Sciences Society annual meeting.
- Steinberg, N.J., **Roth, Z.N.**, Movshon, J.A., Merriam, E.P. (2019), *Neural correlates of the double-drift illusion*. Vision Sciences Society annual meeting.
- **Roth, Z.N.**, Heeger, D.J., & Merriam, E.P. (2018), *Orientation selectivity and stimulus vignetting in human visual cortex*. Cognitive Computational Neuroscience annual meeting.
- Ryoo, M., Burlingham, C., **Roth, Z.**, Mirbagheri, S., Heeger, D.J., & Merriam, E. (2018), *A widespread task-related hemodynamic response in human V1 is modulated by task difficulty*. Vision Sciences Society annual meeting.
- **Roth, Z.N.**, & Merriam, E.P. (2017). *Stimulus vignetting and coarse-scale biases for orientation in human visual cortex*. Society for Neuroscience (SfN) annual meeting.

- **Roth, Z.N.**, & Merriam, E.P. (2017). *Stimulus vignetting and orientation selectivity in human visual cortex*. National Institute of Mental Health (NIMH) Training Day.
- **Roth, Z.N.**, & Zohary, E. (2016). *Position Information in Human Visual Cortex*. Organization of Human Brain Mapping (OHBM) Annual Meeting.
- **Roth, Z.N.**, & Zohary, E. (2016). *Position Information in Human Visual Cortex*. Jerusalem Brain Community (JBC) Annual Retreat.
- **Roth, Z. N.**, & Zohary, E. (2014). *Position invariance and object affordance in human parietal cortex*. European Conference of Visual Perception (ECVP) 2014 Meeting.
- **Roth, Z.**, & Zohary, E. (2013). *Learning to recognize degraded objects is associated with a greater match to the objects' template fMRI activation patterns in Lateral Occipital Cortex*. Vision Sciences Society 2013 Meeting.

Teaching Experience

2025-present	Introduction to Statistics (course no. 852721301). BSc program, Gonda Brain Research Center. Bar-Ilan University.
2024-present	Machine Learning & Neural Networks for neuroscience (course no. 852750401). MSc program, Gonda Brain Research Center. Bar-Ilan University.
June 2021	Guest Lecturer, 'Laminar fMRI', in: <i>Advanced fMRI analyses for cognitive and vision research</i> (course no. 76962). ELSC, Hebrew University of Jerusalem
2015-2016	Teacher Assistant, <i>Uncovering principles of human vision using fMRI</i> (course no. 76962). Initiated and built course, and delivered lectures. ELSC, Hebrew University of Jerusalem
2012-2014	Teacher Assistant, <i>Cognitive Processes A</i> (course no. 76912). Modified course, translated to English, and delivered lectures. ELSC, Hebrew University of Jerusalem
November 2012	Guest Lecturer, 'Visual Perception', in: <i>Cognitive Processes for Cognitive Sciences</i> (course no. 06115). Hebrew University of Jerusalem
2012-2013	Teacher Assistant, <i>Data Structures</i> (course no. 10031). Prepared and delivered review lectures. Azrieli College of Engineering, Jerusalem

Personal Info

- Citizenship: Israeli, American, Australian
- Place of birth: Melbourne, Australia
- Married + 3 children
- Email: zviroth@gmail.com; Website: <https://zviroth.github.io/>