Eshed Margalit, PhD

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Education

Stanford University | 2016 - 2022
PhD Dissertation: A Unified Model of the Structure and Function of Primate Visual Cortex
Neurosciences Graduate Program
Cumulative GPA: **4.12**

University of Southern California | 2012 - 2016
B.S. with Honors in **Computational Neuroscience**
Minor in **Computer Science**
Cumulative GPA: **3.99**

Research

Stanford NeuroAI Lab | PI Daniel L.K. Yamins | 2016 - 2023
Modeling the structure, development, and function of primate visual cortex with topographic deep convolutional neural networks

Stanford Vision and Perception Neuroscience Lab | PI Kalanit Grill-Spector | 2016 - 2023
Characterizing object representations in human higher visual cortex at sub-millimeter resolution via ultra-high-resolution fMRI

USC Image Understanding Lab | PI Irving Biederman | 2014 – 2016
Interrogating object representations in visual cortex and psychophysical correlates of developmental prosopagnosia

USC Emotion and Cognition Lab | PI Mara Mather | 2013 – 2014
Investigating the role of the noradrenergic arousal system in aging and memory

Publications

Published

1. Clewett, D., Lee, T.H., Greening, S., Ponzio, A., **Margalit, E.**, & Mather, M. (2016). Neuromelanin marks the spot: Identifying a locus coeruleus biomarker of cognitive reserve in healthy aging. *Neurobiology of Aging, 37, 117-126*.

2. **Margalit, E.**, Shah, M.P., Tjan, B.S., Biederman, I., Keller, B., & Brenner, R. (2016). The lateral occipital complex shows no net response to object familiarity. *Journal of Vision. Journal of Vision*, *16*(11).

3. **Margalit, E.**, Herald, S.B., Yue, X., von der Malsburg, C., & Biederman, I. (2016). An applet for the Gabor Scaling of the Differences Between Complex Stimuli. *Attention, Perception, & Psychophysics, 78(8), 2298-2306.*

4. **Margalit, E.**, Biederman, I., Tjan, B.S., and Shah, M.P. (2017) What is actually affected by the scrambling of objects when localizing the lateral occipital complex? *Journal of Cognitive Neuroscience, 20(9), 1595 - 1604.*

5. Biederman, I., Shilowich, B.E., Herald, S.B., **Margalit, E.**, Maarek, R., Meschke, E.X. and Hacker, C.M. (2018). The cognitive neuroscience of person identification. *Neuropsychologia, 116B, 205-214.*

6. Kay, K., Jamison, K. W., Vizioli, L., Zhang, R., **Margalit, E.**, and Ugurbil, K. (2019). A critical assessment of data quality and venous effects in sub-millimeter fMRI. *NeuroImage*, 189, 847-869.

7. **Margalit, E.**, Herald, S.B., Meschke, E.X., Irawan, I., Maarek, R. and Biederman, I. (2019). Visual noise consisting of X-junctions has only a minimal adverse effect on object recognition. *Attention, Perception, & Psychophysics*, 82, 995–1002.

8. **Margalit, E.**, Jamison, K.W., Weiner, K.S., Vizioli, L., Zhang, R., Kay, K.N. and Grill-Spector, K. (2020). Ultra-high-resolution fMRI of human ventral temporal cortex reveals differential representation of categories and domains. *Journal of Neuroscience*, 40(15), 3008-3024.

9. Kong, N.C.L., **Margalit, E.,** Gardner, J.L., and Norcia, A.M.. Increasing neural network robustness improves match to macaque V1 eigenspectrum, spatial frequency preference and predictivity. *PLOS Computational Biology,* 18(1), e1009739.

10. Kunin, D., Sagastuy-Brena, J., Gillespie, L., **Margalit, E.**, Tanaka, H., Ganguli, S., and Yamins, D.L.K. (2021). The Limiting Dynamics of SGD: Modified Loss, Phase-Space Oscillations, and Anomalous Diffusion. *Neural Computation*, 36 (1): 151–174.

11. **Margalit, E.**, Lee, H., Finzi, D., DiCarlo, J. J., Grill-Spector, K., & Yamins, D. L. (2024). A unifying framework for functional organization in early and higher ventral visual cortex. *Neuron*, 112(14), 2435-2451.

Preprints

1. Rosenke, M., van den Hurk, J., **Margalit, E.**, de Beeck, H. P. O., and Weiner, K. S. (2020). Extensive individual differences of category information in ventral temporal cortex in the congenitally blind. *bioRxiv*.

2. Crawford, J., **Margalit, E.**, Grill-Spector, K., and Poltoratski, S. (2020). Validation and generalization of pixel-wise relevance in convolutional neural networks trained for face classification. a*rXiv.*

3. Lee, H., **Margalit, E.**, Jozwik, K.M., Cohen, M.A., Kanwisher, N., Yamins, D.L.K., and DiCarlo, J.J. (2020). Topographic deep artificial neural networks reproduce the hallmarks of the primate inferior temporal cortex face processing network. *bioRxiv*.

4. Finzi, D., **Margalit, E.**, Kay, K., Yamins, D.L.K., and Grill-Spector, K. (2023). A single computational objective drives specialization of streams in visual cortex. *bioRxiv*.

5. Tuckute, G., Finzi, D., **Margalit, E.**, Zylberberg, J., Chung, S., Fyshe, A., Chung, S., Fedorenko, E., Kriegeskorte, N., Grill-Spector K., and Kar, K. (2024). How to optimize neuroscience data utilization and experiment design for advancing brain models of visual and linguistic cognition?. *Neurons, Behavior, Data Analysis, and Theory,* January. https://doi.org/10.51628/001c.127807.

Presentations and Posters

Conference Presentations

1. Margalit, E., Jamison, K., Weiner, K.S., Vizioli, L., Zhang, R., Kay, K.N. and Grill-Spector, K. (2018). Differential representation of object category information across lateral and medial ventral temporal cortex revealed with ultra-high-resolution fMRI. Presented at the Annual Meeting of the Society for Neuroscience, San Diego, CA. November.

2. Margalit, E., Jamison, K., Weiner, K.S., Vizioli, L., Zhang, R., Kay, K.N. and Grill-Spector, K. (2019). Ultra-high-resolution fMRI reveals differential representation of categories and domains across lateral and medial ventral temporal cortex. Presented at the Annual Meeting of the Vision Sciences Society, St. Pete Beach, FL. May.

Invited Talks

1. **Margalit, E.** (2021)**.** Identifying Constraints on the Emergence of V1 Functional Architecture with CNNs. Simons Collaboration Global Brain Monthly Meeting. January.

2. **Margalit, E.** (2025). Multimodal World Models for Drug Discovery. Stanford CS25: Transformers United V5. May.

Posters

1. Biederman, I., Herald, S. B., Xu, X., Amir, O., Shilowich B. E., & **Margalit, E.** (2015). Phonagnosia, a Voice Homologue to Prosopagnosia. Poster presented at the Annual Meeting of the Vision Sciences Society, St. Petersburg Beach, FL. May.

2. Clewett, D., Lee, T.H., Greening, S. G., Ponzio, A., **Margalit, E.**, & Mather M. (2015). Neuromelanin Marks the Spot: A Locus Coeruleus Substrate of Cognitive Reserve in Healthy Aging. USC Neuroscience Graduate Student Symposium, Los Angeles, CA. Jan.

3. Biederman, I., **Margalit, E.**, Tjan B.S., & Shah, M.P. (2016). What is actually affected by the scrambling of objects when localizing LOC? Presented at the Annual Meeting of the Vision Sciences Society, St. Petersburg Beach, FL. May.

4. **Margalit, E.**, Yue, X., & Biederman, I. (2016). Impaired Face and Non-face Discrimination in Developmental Prosopagnosics (DPs). Presented at the Annual Meeting of the Vision Sciences Society, St. Petersburg Beach, FL. May.

5. Irawan, I., **Margalit, E**., Herald, S.B., & Biederman, I. (2016). Vertices are Effective in Perceptual Grouping (and Ungrouping). Presented at the Annual Meeting of the Vision Sciences Society, St. Petersburg Beach, FL. May.

6. Biederman, I., **Margalit, E.**, Tjan, B. S., & Shah, M. P. (2016). What is actually affected by the scrambling of objects when localizing LOC? Talk presented at the Annual Meeting of the Society of Experimental Psychologists. Columbia University, New York. April.

7. Biederman, I., **Margalit, E.,** Maarek, R., Meschke, E.X., Shilowich, B.E., Hacker, C.M., Juarez, J.J., Seamans, T.J. and Herald, S.B. (2017). What is the nature of the perceptual deficit in congenital prosopagnosia? Presented at the Annual Meeting of the Vision Sciences Society, St. Petersburg Beach, FL. May.

8. **Margalit, E.**, Lee, H., DiCarlo, J.J. and Yamins, D.L.K. (2018). Pinwheel-like Iso-Orientation Domains in a Convolutional Neural Network Model. Presented at the Annual Meeting of the Vision Sciences Society, St. Petersburg Beach, FL. May.

9. **Margalit, E.**, Lee, H., Marques, T., DiCarlo, J.J. and Yamins, D.L.K. (2020). Correlation-based spatial layout of deep neural network features generates ventral stream topography. Presented at COSYNE 2020, Denver, CO. February.

10. **Margalit, E**., Lee, H., DiCarlo, J.J., Grill-Spector, K., and Yamins, D.L.K. (2021). Topographic deep neural networks predict the functional organization of the primate ventral visual pathway. Presented at SfN 2021, Chicago IL. November.

Awards and Grants

NSF Graduate Research Fellowship Program (GRFP) Fellow | 2016 – 2021
NSF fellowship recognizes and supports outstanding graduate students in NSF-supported science, technology, engineering, and mathematics disciplines

USC Neuroscience Outstanding Student of the Year | 2016
Awarded to USC's best neuroscience student with senior standing

Brian Philip Rakusin Neuroscience Award | 2015
Awarded to USC's best neuroscience student with sophomore or junior standing

USC University Trustees Award | 2016
Awarded for highest GPA among undergraduate males at the University

Other Awards and Scholarships from USC

Discovery Scholar: Awarded for exceptional research and scholarship

5x Provost's Undergraduate Research Fellowship, 1x SOAR Grant: funding for undergraduate research based on strength of research proposals

Dean's Scholarship

George H. Mayr Scholarship

Phi Beta Kappa Honor Society | 2015

Teaching and Mentorship

Organizer and Instructor, Stanford CNJCx: Practical Python | 2020
Rotation Student Supervisor | 2020, 2021
Stanford Neuroscience Application Assistance Program (SNAAP), 4 mentees | 2020, 2021
Teaching Assistant, Introduction to Perception (PSYCH 30) | Fall 2017, 2018
Teaching Assistant, Stanford Intensive Neuroscience (SIN) Bootcamp | Fall 2017
Instructor, Stanford Splash
Instructor, Stanford Brain Day
Mentor and workshop leader, for NSF GRFP Application | 2017 – 2019
Mentor, Stanford Biosciences Student Association | 2017 - 2021

Service

Chair, SfN Nanosymposium: Extrastriate Vision | 2018
Co-leader, Stanford Computational Neuroscience Journal Club | 2018-2020
Reviewer, *eLife, iScience, Neuron*
Student Representative, Stanford Neurosciences PhD Program Student Program Committee | 2018
Student Speaker Representative, Stanford Neurosciences PhD Program | 2017 – 2018
Student Representative, USC Undergraduate Neuroscience Executive Committee | 2015 - 2016
Team Captain, USC Cross Country Club | 2014-2015