

# Dr. Paul S. Scotti

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Goal: Bridging neuroscience and AI to decode mental representations and drive healthcare innovation.

## EXPERIENCE & EDUCATION

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### Stability AI

Nov. 2023 – Present

Head of Neuroimaging

Principal Investigator of the MedARC Neuroimaging & AI Lab ([medarc-ai.github.io/mind-reading](http://medarc-ai.github.io/mind-reading))

### Princeton Neuroscience Institute

Visiting research scientist

Nov. 2023 – Present

Postdoctoral research associate

Apr. 2022 – Nov. 2023

Computational Memory Lab (PI: Dr. Kenneth Norman) ([compmem.princeton.edu](http://compmem.princeton.edu))

### The Ohio State University

Oct. 2017 – Apr. 2022

Vision and Cognitive Neuroscience Lab (PI: Dr. Julie Golomb)

Cognitive Control Lab (PI: Dr. Andy Leber)

Ph.D. student (co-advised)

Dissertation on “Using Computational Models to Observe Visual Memory Distortions and Reconstruct Content from the Brain”

### The George Washington University

Attention and Cognition Lab (PI: Dr. Sarah Shomstein)

Sep. 2014 – May 2017

Visual Cognition Lab (PI: Dr. Steve Mitroff)

Sep. 2016 – May 2017

Undergraduate researcher (distinguished/honors scholar, magna cum laude, [2017 commencement speaker](#))

## PUBLICATIONS

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1. **Scotti, P. S.**, Banerjee, A., Goode, J., Shabalin, S., Nguyen, A., Cohen, E., Dempster, A. J., Verlinde, N., Yundler, E., Weisberg, D., Norman, K. A., & Abraham, T. M. (2023). Reconstructing the Mind's Eye: fMRI-to-Image with Contrastive Learning and Diffusion Priors. *NeurIPS spotlight*. [doi.org/10.48550/arXiv.2305.18274](https://doi.org/10.48550/arXiv.2305.18274). **US Senate hearing on AI and Intellectual Property discusses our work as an example AI medical application.**
2. Babu, A., **Scotti, P. S.**, & Golomb, J. D. (2023). The dominance of spatial information in object identity judgments: A persistent congruency bias even amidst conflicting statistical regularities. *Journal of Experimental Psychology: Human Perception and Performance*. [doi.org/10.1037/xhp0001104](https://doi.org/10.1037/xhp0001104)
3. Wallace, G., Polcyn, S., Brooks, P. P., Mennen, A., Zhao, K., **Scotti, P. S.**, Michelmann, S., Li, K., Turk-Browne, N. B., Cohen, J. D., Norman, K. A. (2022). RT-Cloud: A Cloud-based Software Framework to Simplify and Standardize Real-Time fMRI. *NeuroImage*. [doi.org/10.1016/j.neuroimage.2022.119295](https://doi.org/10.1016/j.neuroimage.2022.119295)
4. **Scotti, P. S.** & Maxcey, A. M. (2022). Directed forgetting of pictures of everyday objects. *Journal of Vision*. [doi.org/10.1167/jov.22.10.8](https://doi.org/10.1167/jov.22.10.8)
5. Maxcey, A. M., Mancuso, E., **Scotti, P. S.**, Spinelli, E., & Woodman, G. F. (2022). How to induce the forgetting of pictures. *Visual Memory* (Routledge). Eds. Wilma Bainbridge & Timothy Brady. ISBN 9780367744878.
6. **Scotti, P. S.**, Kulkarni, A., Mazor, M., Klapwijk, E., Huth, A. G. (2021). Interactive 3d brain helps you learn how the brain is organized. *Frontiers for Young Minds*. [doi.org/10.3389/frym.2021.575131](https://doi.org/10.3389/frym.2021.575131)
7. **Scotti, P. S.**, Chen, J., & Golomb, J. D. (2021). An enhanced inverted encoding model for neural reconstructions. *bioRxiv*. [doi.org/10.1101/2021.05.22.445245](https://doi.org/10.1101/2021.05.22.445245)
8. **Scotti, P. S.** & Maxcey, A. M. (2021). What do laboratory-forgetting paradigms tell us about use-inspired forgetting? *Cognitive Research: Principles and Implications*. [doi.org/10.1186/s41235-021-00300-6](https://doi.org/10.1186/s41235-021-00300-6)
9. Chen, J., **Scotti, P. S.**, Dowd, E. W., & Golomb, J. D. (2021). Neural representations of task-relevant and task-irrelevant features of attended objects. *bioRxiv*. [doi.org/10.1101/2021.05.21.445168](https://doi.org/10.1101/2021.05.21.445168)
10. **Scotti, P. S.**, Hong, Y., Leber, A. B., & Golomb, J. D. (2021). Visual working memory items drift apart due to active, not

passive, maintenance. *Journal of Experimental Psychology: General*. [doi.org/10.1037/xge0000890](https://doi.org/10.1037/xge0000890)

11. **Scotti, P. S.**, Hong, Y., Golomb, J. D., & Leber, A. B. (2021). Statistical regularities as a reference point for memory distortions: Swap and shift errors. *Attention, Perception, & Psychophysics*, 1-21. [doi.org/10.3758/s13414-020-02236-3](https://doi.org/10.3758/s13414-020-02236-3)
12. **Scotti, P. S.**, Kulkarni, A., Mazor, M., Klapwijk, E., Yarkoni, T., Huth, A. G. (2020). EduCortex: browser-based 3D brain visualization of fMRI meta-analysis maps. *Journal of Open Source Education*, 3(26), 75. [doi.org/10.21105/jose.00075](https://doi.org/10.21105/jose.00075)
13. **Scotti, P. S.**, Janakieffski, L., & Maxcey, A. M. (2020). Recognition-induced forgetting of schematically related pictures. *Psychonomic Bulletin & Review*, 27, 357–365. [doi.org/10.3758/s13423-019-01693-8](https://doi.org/10.3758/s13423-019-01693-8)
14. **Scotti, P. S.**, Collegio, A., & Shomstein, S. (2019). Object-based attention is resilient to low-level (boundary) or high-level (semantic) disturbances, but not both. *PsyArXiv*. [doi.org/10.31234/osf.io/yxqju](https://doi.org/10.31234/osf.io/yxqju)
15. Collegio, A., Nah, J., **Scotti, P. S.**, & Shomstein, S. (2019). Attention scales according to inferred real-world object size. *Nature Human Behavior*, 3(1), 40-47. [doi.org/10.1038/s41562-018-0485-2](https://doi.org/10.1038/s41562-018-0485-2)

## SCHOLARSHIPS, FELLOWSHIPS, & AWARDS

• NSF Graduate Research Fellowship (\$102,000)	2019-2022
• CCBB Student Neuroimaging Research Award (\$3000)	2018
• OSU University Fellowship (\$26,316)	2017
• GW CCAS Distinguished Scholar	2017
• Luther Rice Undergraduate Research Fellowship (\$5000)	2016
• Sigelman Undergraduate Research Enhancement Award (\$500)	2016
• GW Presidential Academic Scholarship Recipient	2013

## TALK / POSTER PRESENTATIONS (talks/workshops marked with \*)

1. **Scotti, P. S.**, Banerjee, A., Goode, J., Shabalin, S., Nguyen, A., Cohen, E., Dempster, A. J., Verlinde, N., Yundler, E., Weisberg, D., Norman, K. A., & Abraham, T. M. (2023). Reconstructing the Mind's Eye: fMRI-to-Image with Contrastive Learning and Diffusion Priors. *NeurIPS*. New Orleans, LA.
2. **Scotti, P. S.**, Hennings, A. C., Wallace, G., Polcyn, S., Brooks, P. P., Mennen, A., Zhao, K., Michelmann, S., Li, K., Turk-Browne, N. B., Cohen, J. D., Norman, K. A. (2023). Cloud-based Software Framework to Simplify and Standardize Real-time fMRI. *BRAIN Initiative*. Bethesda, MD.
3. \***Scotti, P. S.**, Hennings, A. C., Norman, K. A.. Conducting RT-fMRI Studies with the Realtime fMRI Cloud Framework (RT-Cloud). *Real-Time Functional Imaging and Neurofeedback Meeting*. New Haven, CT.
4. Wallace, G., **Scotti, P. S.**, Polcyn, S., Brooks, P. P., Mennen, A., Zhao, K., Michelmann, S., Li, K., Turk-Browne, N. B., Cohen, J. D., Norman, K. A. (2022). Cloud-based Software Framework to Simplify and Standardize Real-time fMRI. *BRAIN Initiative*. Virtual conference.
5. **Scotti, P. S.**, Chen, J., & Golomb, J. D. (2022, May). An enhanced inverted encoding model for neural reconstructions of visual perception, attention, and memory. *Vision Sciences Society*. Virtual conference.
6. **Scotti, P. S.**, Chen, J., & Golomb, J. D. (2021, June). An improved method for evaluating inverted encoding models. *Visual Working Memory Symposium*. Virtual conference.
7. **Scotti, P. S.**, Chen, J., & Golomb, J. D. (2021, May). An improved method for evaluating inverted encoding models. *Vision Sciences Society*. Virtual conference.
8. Chen, J., **Scotti, P. S.**, Dowd, E. W., & Golomb, J. D. (2021, May). Neural representations of task-relevant and task-irrelevant features of attended objects. *Vision Sciences Society*. Virtual conference.
9. **Scotti, P. S.**, Chen, J., & Golomb, J. D. (2021, March). An improved method for evaluating inverted encoding models. *Cognitive Neuroscience Society*. Virtual conference.
10. Jones, C. M., **Scotti, P. S.**, & Golomb, J. D. (2020, May). Feature-binding errors during saccadic remapping may affect perception of real-world objects. *Vision Sciences Society*. Virtual conference.
11. **Scotti, P. S.**, Kulkarni, A., Mazor, M., Klapwijk, E., Yarkoni, T., Huth, A. G. (2019, December). EduCortex: browser-based 3D brain visualization of fMRI meta-analysis maps. **Awarded best poster**, *Center for Cognitive and Behavioral Brain Imaging Annual Research Days*, Columbus, OH.
12. \***Scotti, P. S.**, Hong, Y., Leber, A. B., & Golomb, J. D. (2019, November). Competition between similar visual working memory items underlies repulsion effects. *Object Perception, Attention, and Memory (OPAM)*, Montreal, Quebec.
13. **Scotti, P. S.**, Janakieffski, L., & Maxcey, A. M. (2019, November). Recognition-Induced Forgetting Does Not Operate Over Superordinate Categories. *Psychonomic Society*, Montreal, Quebec.
14. **Scotti, P. S.**, Hong, Y., Leber, A. B., & Golomb, J. D. (2019, October). Competition Between Similar Visual Working Memory Items Produces Repulsion Effects. *Society for Neuroscience*, Chicago, IL.
15. **Scotti, P. S.**, Hong, Y., Golomb, J. D., Leber, A. B. (2019, May). Relational interactions between visual memory representations increase with maintenance duration. *Vision Sciences Society*, St. Pete Beach, FL.
16. Babu, A., **Scotti, P. S.**, Golomb, J. D. (2019, May). The dominance of spatial information in location judgments: A persistent congruency bias even amidst conflicting statistical regularities. *Vision Sciences Society*, St. Pete Beach, FL.
17. Janakieffski, L., Smerdell, M., **Scotti, P. S.**, Maxcey, A. (2019, March). Does recognition-induced forgetting operate over temporally-grouped objects? *CogFest*, Columbus, OH.
18. **Scotti, P. S.**, Hong, Y., Golomb, J. D., Leber, A. B. (2018, November). Statistical regularities during object encoding distort long-term memory. **Awarded best poster (\$200)**, *Object Perception, Attention, and Memory (OPAM)*, New Orleans, LA.

19. **Scotti, P. S.,** Hong, Y., Golomb, J. D., Leber, A., B. (2018, September). Statistical regularities during object encoding distort long-term memory. *Center for Cognitive and Brain Sciences Fall Retreat*, Mt. Sterling, OH.
20. **Scotti, P. S.,** Hong, Y., Golomb, J. D., Leber, A., B. (2018, May). Statistical regularities during object encoding distort long-term memory. *Vision Sciences Society*, St. Pete Beach, FL.
21. Adamo, S., Nah, J., Collegio, A., **Scotti, P. S.,** Shomstein, S. (2018, May). The flux capacitor account: A new theoretical account of multiple target visual search errors. *Vision Sciences Society*, St. Pete Beach, FL.
22. \*Collegio, A., Nah, J., **Scotti, P. S.,** Shomstein, S. (2017, November). Real-world object size affects attentional allocation. *Object Perception, Attention, and Memory (OPAM)*, Vancouver, BC.
23. **Scotti, P. S.,** Collegio, A., & Shomstein, S. (2017, November). Task-irrelevant object category guides attentional allocation. *Object Perception, Attention, and Memory (OPAM)*, Vancouver, BC.
24. **Scotti, P. S.,** Adamo, S., Mitroff, S., Shomstein, S. (2017, May). Repetition priming preferentially benefits infrequent targets. *Vision Sciences Society*, St. Pete Beach, FL.
25. Adamo, S., Nah, J., Collegio, A., **Scotti, P. S.,** Shomstein, S. (2017, May). Does orientation matter? Same or differently oriented targets in a multiple target search. *Vision Sciences Society*, St. Pete Beach, FL.
26. Collegio, A., Nah, J., **Scotti, P. S.,** Shomstein, S. (2017, May). Real-world object size affects attentional allocation. *Vision Sciences Society*, St. Pete Beach, FL.
27. **Scotti, P. S.,** Adamo, S., Mitroff, S., Shomstein, S. (2017, April). Repetition priming preferentially benefits infrequent targets. **1<sup>st</sup> place Psychology poster**, *GW Research Days event*, Washington, D.C.
28. **Scotti, P. S.,** Malcolm, G.L., Peterson, M., & Shomstein, S. (2016, November). Reality vs. Simplicity: The effects of real-world objects on attentional selection. *Object Perception, Attention, and Memory (OPAM)*, Boston, MA.
29. **Scotti, P. S.,** Malcolm, G.L., Peterson, M., & Shomstein, S. (2016, May). Reality vs. Simplicity: The effects of real-world objects on attentional selection. *Vision Sciences Society*, St. Pete Beach, FL.

## SKILLS

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- Python, MATLAB, R
- Neural networks (PyTorch) and encoding/decoding models
- fMRI (designing experiments, collecting data, pre-/post-processing; SPM, Nipype, Freesurfer, Fmriprep)
- Supercomputing / cloud computing (Amazon Web Services, Microsoft Azure, Slurm HPCs)
- Hierarchical Bayesian modeling (PyMC3, JAGS)
- HTML / CSS / JavaScript / Node.js (experience building Amazon Mechanical Turk experiments)
- Eye-tracking (experience using/designing experiments for EyeLink 1000 Plus)

## MENTORSHIP

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Seungwan (Kevin) Son, Stephenie Chen, Karit (Keith) Matanachai, Ashutosh Narang, Cesar Torrico, Mihir Tripathy, Atmadeep Banerjee, Stepan Shabalin, David Weisberg, Foyez Alauddin, Nathalie Verlinde, Anisha Babu, Molly McKinney

## AD HOC REVIEWING

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Nature Neuroscience; NeuroImage; Imaging Neuroscience; Scientific Reports; Psychonomic Bulletin & Review; Journal of Experimental Psychology: General; Journal of Experimental Psychology: Learning, Memory, and Cognition; Attention, Perception, & Psychophysics; Memory; Memory & Cognition; Journal of Open Source Education

## PROFESSIONAL DEVELOPMENT / TEACHING

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- MedARC, Head of Neuroimaging & AI Lab 2023 –  
Leading neuroimaging open research projects, mentoring international online community of volunteers
- OnNeuro, Founder 2017 – 2022  
Hosting/sharing open-access research talks in the fields of psychology and neuroscience
- Center for Cognitive and Behavioral Brain Imaging Student Org, Technical Director 2017 – 2022  
Organizing interdisciplinary workshops and guest speaker presentations at Ohio State Univ.
- Center for Cognitive and Brain Sciences Undergraduate Summer Institute (CUSI) 2018/2019/2021  
Lectured on lab organization, questionable research practices, open science, and pre-registration
- NeuroHackademy Summer 2019  
Led a team of researchers to create [EduCortex](#), an educational brain viewer
- Guest Lecturer (Ohio State University) Fall 2019

- Introduction to Psychology (PSYCH 1001)  
Course Assistant (Ohio State University)  
Sensation and Perception (PSYCH 3310)  
Cognitive Psychology Laboratory (PSYCH 4510)  
Introduction to Social Psychology (PSYCH 3325)

Spring 2019  
2018 – 2019  
Autumn 2018