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Dr. Paul S. Scotti

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

EXPERIENCE & EDUCATION

Computational Memory Lab (PI: Dr. Kenneth Norman) **Apr. 2022 – Present**
Postdoctoral Research Associate at Princeton Neuroscience Institute *Princeton, NJ*

Stability AI / Medical AI Research Center (MedARC) **Feb. 2023 – Present**
Neuroimaging & AI project lead (medarc-ai.github.io/mind-reading)

Vision and Cognitive Neuroscience Lab (PI: Dr. Julie Golomb) **Oct. 2017 – Apr. 2022**
Cognitive Control Lab (PI: Dr. Andy Leber)
Ph.D. student (co-advised) at The Ohio State University *Columbus, OH*
Dissertation on "Using Computational Models to Observe Visual Memory Distortions and Reconstruct Content from the Brain"

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 at George Washington University *Washington, DC*
Distinguished/Honors scholar, magna cum laude, 2017 commencement speaker

PUBLICATIONS

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
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
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
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
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
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
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
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
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
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
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

13. **Scotti, P. S.,** Janakiefski, 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
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
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

SCHOLARSHIPS, FELLOWSHIPS, & AWARDS

- NSF Graduate Research Fellowship ($102,000) 2019-2022
- CCBBI 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.,** 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.
2. ***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.
3. 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.
4. **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.
5. **Scotti, P. S.,** Chen, J., & Golomb, J. D. (2021, June). An improved method for evaluating inverted encoding models. *Visual Working Memory Symposium*. Virtual conference.
6. **Scotti, P. S.,** Chen, J., & Golomb, J. D. (2021, May). An improved method for evaluating inverted encoding models. *Vision Sciences Society*. Virtual conference.
7. 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.
8. **Scotti, P. S.,** Chen, J., & Golomb, J. D. (2021, March). An improved method for evaluating inverted encoding models. *Cognitive Neuroscience Society*. Virtual conference.
9. 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.
10. **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.
11. ***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.
12. **Scotti, P. S.,** Janakiefski, L., & Maxcey, A. M. (2019, November). Recognition-Induced Forgetting Does Not Operate Over Superordinate Categories. *Psychonomic Society*, Montreal, Quebec.
13. **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.
14. **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.
15. 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.
16. Janakiefski, L., Smerdell, M., **Scotti, P. S.**, Maxcey, A. (2019, March). Does recognition-induced forgetting operate over temporally-grouped objects? *CogFest*, Columbus, OH.
17. **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.
18. **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.
19. **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.
20. 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.
21. *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.

22. **Scotti, P. S.,** Collegio, A., & Shomstein, S. (2017, November). Task-irrelevant object category guides attentional allocation. *Object Perception, Attention, and Memory (OPAM)*, Vancouver, BC.
23. **Scotti, P. S.,** Adamo, S., Mitroff, S., Shomstein, S. (2017, May). Repetition priming preferentially benefits infrequent targets. *Vision Sciences Society*, St. Pete Beach, FL.
24. 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.
25. 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.
26. **Scotti, P. S.,** Adamo, S., Mitroff, S., Shomstein, S. (2017, April). Repetition priming preferentially benefits infrequent targets. **1st place Psychology poster**, *GW Research Days event*, Washington, D.C.
27. **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.
28. **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

- 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

Atmadeep Banerjee, Stepan Shabalin, David Weisberg, Foyez Alauddin, Nathalie Verlinde, Anisha Babu, Molly McKinney

AD HOC REVIEWING

Nature 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

- MedARC, Neuroimaging & AI project lead — 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) — Spring 2019
  Cognitive Psychology Laboratory (PSYCH 4510) — 2018 – 2019
  Introduction to Social Psychology (PSYCH 3325) — Autumn 2018