Catrina McKenzie Hacker

EDUCATION

University of Pennsylvania, PhD in neuroscience **Present**

University of Southern California, Neuroscience B.S. with honors, *Summa cum laude* **2015 – 2019**

RESEARCH EXPERIENCE

Graduate Student **2019 – Present**

Visual Memory Lab, *Advisor: Nicole C. Rust*

Perform electrophysiological recordings and execute computational analyses to elucidate neural mechanisms of visual recognition memory.

Undergraduate Research Assistant **2018 – 2019**

Bottjer Songbird Lab*, Advisor: Sarah W. Bottjer*

Assist in electrophysiological and optogenetic experiments in cortico-basal ganglia circuits of zebra finches to explicate the neural circuitry involved in song learning and production.

Undergraduate Research Assistant **2016 – 2019**

USC Image Understanding Lab, *Advisor: Irving Biederman*

Design, execute and analyze psychophysical studies investigating nature and limits of human face recognition to develop neurocomputational accounts of face processing.

PUBLICATIONS

Primary Research Articles

Hacker, C.M., Biederman, I., Zhu, T., Nelken, M. & Meschke, E.X. (2022). The sizable difficulty in matching unfamiliar faces differing only moderately in orientation in depth is a function of image dissimilarity. *Vision Research*. doi: 10.1016/j.visres.2021.09.005.

Hacker, C.M., Meschke, E.X. & Biederman, I. (2019). A Face in a (Temporal) Crowd. *Vision Research*, doi: 10.1016/j.visres.2018.02.007.

Reviews

Biederman, I., Shilowich, B.E., Herald, S.B., Margalit, E., Maarek, R., Meschke, E.X. & **Hacker, C.M.** (2018). The Cognitive Neuroscience of Person Identification. *Neuropsychologia*, 116, 205-214. doi: 10.1016/j.neuropsychologia.2018.01.036.

Preprints

Hacker, C.M. & Biederman, I. (2019). The proficiency for distinguishing faces is independent of the proficiency for remembering them. *PysArxiv*. doi: 10.31234/osf.io/9bwct.

Hacker, C.M. & Biederman, I. (2019). The invariance of recognition to the stretching of faces is not explained by familiarity or warping to an average face. *PsyArxiv*. doi: 10.31234/osf.io/e5hgx.

Other

Hacker, C.M. & Rust, N.C. (2022). Ritalin as a causal perturbation. *Trends in Cognitive Sciences*, Research Spotlight. doi: 10.1016/j.tics.2022.04.002.

POSTERS AND PRESENTATIONS

Talks

Hacker, C.M., Jannuzi, B.G.L., Meyer, T., Hay, M.L. & Rust, N.C. (2022) Worse remembering of a dog when viewed in a sequence of dogs is dominated by changes in memory mechanisms as opposed to sensory adaptation. Talk presented at the annual meeting of the Vision Sciences Society, St. Petersburg Beach, FL. May. doi: 10.1167/jov.22.14.4075.

Hacker, C.M, Jannuzi, B.G.L., Meyer, T., Hay, M.L. & Rust, N.C. (2023) Identifying the neural correlates of contextual influences on image memorability. Talk presented at the annual Neuroscience/Vision/Auditory Training Grant Retreat, Philadelphia, PA. May.

Posters Presented

Hacker, C.M., Jannuzi, B.G.L., Meyer, T., Hay, M.L. & Rust, N.C. (2023) A role for cortical pattern separation in enhancing visual memory. Poster presented at 150th Scheie Eye Anniversary Meeting, Philadelphia, PA. May.

Hacker, C.M., Jannuzi, B.G.L., Meyer, T., Hay, M.L. & Rust, N.C. (2023) A role for cortical pattern separation in enhancing visual memory. Poster presented at COSYNE, Montreal, Québec, Canada. March.

Hacker, C.M., Jannuzi, B.G.L., Meyer, T., Hay, M.L. & Rust, N.C. (2022) Evidence that the extrinsic effects on memorability are computed in inferotemporal cortex and inherited by the hippocampus. Poster presented at the annual meeting of the Society for Neuroscience, San Diego, CA. November.

Hacker, C.M. & Biederman, I. (2019). The capacity for face perception is independent of the capacity for face memory. Poster presented at the annual meeting of the Vision Sciences Society, St. Petersburg Beach, FL. May. doi: 10.1167/19.10.139a.

Hacker, C.M., Meschke, E.X. & Biederman, I. (2018). Recognition of Stretched Faces. Poster presented at the annual meeting of the Vision Sciences Society, St. Petersburg Beach, FL. May. doi: 10.1167/18.10.160.

Meschke, E.X.*, **Hacker, C.M.***, Juarez, J.J., Maarek, R.S. & Biederman, I. (2017). Detecting Unspecified Familiar Faces. Poster presented at the annual meeting of the Vision Sciences Society, St. Petersburg Beach, FL. May. doi: 10.1167/17.10.1027.

Posters Co-Authored

Bohn, S., **Hacker, C.M.**, Jannuzi, B.G.L., Meyer, T., Hay, M.L. & Rust, N.C. (2022) Disambiguating familiarity from visual modulation: A role for the hippocampus in recognition memory. Poster presented at the annual meeting of the Society for Neuroscience, San Diego, CA. November.

Jannuzi, B.G.L., **Hacker, C.M.,** Meyer, T., Hay, M.L. & Rust, N.C. (2022) Neural analogs of memory sharpening behavior emerge earlier in inferotemporal cortex than the hippocampus. Poster presented at the annual meeting of the Vision Sciences Society, St. Petersburg Beach, FL. May. doi: 10.1167/jov.22.14.4025.

Jannuzi, B.G.L., Meyer, T., Hay, M.L., **Hacker, C.M.** & Rust, N.C. (2021) The remarkable visual specificity of visual recognition memory behavior is shaped by representational sharpening, reflected in inferotemporal cortex. Poster presented at the annual meeting of the Society for Neuroscience, virtual. November.

Biederman, I., Zhu, T., Nelken, M., Meschke, E.X. & **Hacker, C.M.** (2019). The cost of matching depth-rotated faces: A simple, additive function of image similarity. Poster presented at the annual meeting of the Vision Sciences Society, St. Petersburg Beach, FL. May. doi: 10.1167/19.10.136b.

Meschke, E.X., **Hacker, C.M.** & Biederman, I. (2018). How Many Faces Can We Recognize? Poster presented at the annual meeting of the Vision Sciences Society, St. Petersburg Beach, FL. May. doi: 10.1167/18.10/158.

Zhu, T., Nelken, M., **Hacker, C.M.**, Meschke, E.X. & Biederman, I. (2018). Matching Depth-Rotated Faces at Varying Degrees of Physical Similarity. Poster presented at the annual meeting of the Vision Sciences Society, St. Petersburg Beach, FL. May. doi: 10.1167/18.10.932.

Biederman, I., Margalit, E., Maarek, R.S., Meschke, E.X., Shilowich, B.S., **Hacker, C. M.**, Juarez, J.J., Seamans, T. J. & Herald, S.B. (2017). What is the Nature of the Perceptual Deficit in Congenital Prosopagnosia? Poster presented at the annual meeting of the Vision Sciences Society, St. Petersburg Beach, FL. May. doi: 10.1167/17.10/619.

HONORS AND AWARDS

HHMI CSHL Summer Course Funding, *Recipient* **2022**
Partial funding provided by HHMI to attend the *Computational Neuroscience: Vision* summer course at Cold Spring Harbor Laboratory.

Jameson-Hurvich Travel Award, *Recipient* **2022**

NSF Graduate Research Fellowship, *Honorable Mention* **2020**

USC Discovery Scholar, *Distinction recipient*, *Prize finalist* **2019**
Graduation distinction awarded to students who excel in the classroom while demonstrating the ability to create exceptional new scholarship.

USC Neuroscience Outstanding Student of the Year Award, *Recipient* **2019**
Award given to USC's best neuroscience student with senior standing.

Brian Phillip Rakusin Neuroscience Scholarship Award, *Recipient* **2018**
$10,000 Scholarship awarded each year to the most outstanding sophomore or junior demonstrating exceptional achievements and aspirations in the field of Neuroscience.

USC Provost's Undergraduate Research Fellowship, *Six-time Recipient* **2017 – 2019**
Fellowship awarded to select undergraduates demonstrating excellent academic standing and engaged in research, total value of $8,000 over six semesters.

USC Dean's Scholar **2015 – 2019**
Quarter tuition merit-based scholarship to the University of Southern California

TEACHING AND SERVICE

Penn NeuroKnow **2021 – Present**
Writer (2021-Present), Co-Editor (2022-Present)
Student-curated blog with posts about neuroscientific research written for the public.

TEACHING AND SERVICE CONT.

GLIA **2019 – Present**

Member (2019-Present), Co-Director (2022-2023)

Coalition of neuroscience graduate students organizing outreach and professional development events. As co-director I oversaw the eight-member executive board and allocation of $36,500 budget.

Computational and Theoretical Neuroscience **2023**

Recitation Leader

Taught a weekly “computational tutorial” reviewing mathematical concepts from the course for students with a neuroscience background.

CNI +/- Seminar **2021 – 2023**

Organizer

Seminar for students and post docs of the Computational Neuroscience Initiative to present and get feedback about ongoing research.

CORE II: The Electrical Language of Cells **2021 – 2022**

Recitation Leader

Taught weekly recitations for first year graduate students to supplement lectures.