

# tyler bonnen

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University of California, Berkeley  
Electrical Engineering and Computer Science  
Berkeley AI Research (BAIR) Labs

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## **EDUCATION**

2023 PhD, Cognitive Neuroscience, Stanford University  
2016 Research Fellow, Department of Brain and Cognitive Sciences, MIT  
2013 BA, Comparative Literature & Chemistry Columbia University  
2009 AA, Chemical Engineering, Miami Dade Community College

## **APPOINTMENTS**

2023 Postdoctoral Research Fellow, Berkeley AI research (BAIR) labs  
2021 Affiliate, Center for Open and REproducible Science (CORES), Stanford, CA  
2019 Envoy, Wonderfest, San Francisco, CA  
2018 Member, Stanford's Center For Mind, Brain, Computation, and Technology, Stanford, CA  
2016 Trainee, Center for Brains Minds and Machines Summer Course, Woods Hole, MA  
2015 Graduate Student Affiliate, Center Brains Minds and Machines, MIT  
2014 Research Scientist, Max Planck Institute's Neuroanatomy and Connectivity Group, Leipzig

## **AWARDS & HONORS**

2023 University of California President's Postdoctoral Fellowship Program (PPFP)  
2021 NIH Blueprint D-SPAN Award, F99/K00  
2020 Diversifying Academia, Recruiting Excellence (DARE) Fellowship, Stanford University  
2016 National Science Foundation Graduate Research Fellowship  
2009 Dean's List, Columbia University  
2009 Program for Academic Leadership and Success Scholarship, Columbia University  
2007 Tools for Success (STEM) Scholarship, Miami Dade Community College  
2007 Dean's List, Miami Dade Community College

## **PUBLICATIONS**

**Bonnen, T.**, Wagner, A. D., & Yamins, D. L. (2023). Medial temporal cortex supports compositional visual inferences. *bioRxiv*, 2023-09.

O'Connell, T. P., **Bonnen, T.**, Friedman, Y., Tewari, A., Tenenbaum, J. B., Sitzmann, V., & Kanwisher, N. (2023). Approaching human 3D shape perception with neurally mappable models. *arXiv preprint arXiv:2308.11300*.

**Bonnen, T.**, & Eldridge, M. A. (2023). Inconsistencies between human and macaque lesion data can be resolved with a stimulus-computable model of the ventral visual stream. *eLife* 12:e84357

OConnell, T., **Bonnen, T.**, Friedman, Y., Tewari, A., Tenenbaum, J., Sitzmann, V., & Kanwisher, N. (2023). Humans and 3D neural field models make similar 3D shape judgements. *Journal of Vision*, 23(9), 5676-5676.

**Bonnen, T.**, Yamins, D. L.K., & Wagner, A. D. (2021). When the ventral visual stream is not enough: A deep learning account of medial temporal lobe involvement in perception. *Neuron*, 109(17), 2755-2766.

Oligschläger, S., Huntenburg, J. M., Golchert, J., Lauckner, M. E., **Bonnen, T.**, & Margulies, D. S. (2017). Gradients of connectivity distance are anchored in primary cortex. *Brain Structure and Function*, 222(5), 2173-2182.

- Gorgolewski, K. J., Mendes, N., Wilfling, D., Wladimirow, E., Gauthier, C. J., **Bonnen, T.**, ... & Smallwood, J. (2015). A high resolution 7-Tesla resting-state fMRI test-retest dataset with cognitive and physiological measures. *Scientific data*, 2(1)
- Conrad, B. R., Tosado, J., Dutton, G., Dougherty, D. B., Jin, W., **Bonnen, T.**, ... & Robey, S. W. (2009). C<sub>60</sub> cluster formation at interfaces with pentacene thin-film phases. *Applied Physics Letters*, 95(21), 303.

### **INVITED/DEPARTMENTAL TALKS**

- 2023 *"Seeing fast and slow; isolating the contributions of ventral and medial temporal cortex in visual object perception"* Johns Hopkins Early Career Colloquium
- 2022 *Disentangling MTL from VVS contributions to visual object perception*, Kanwisher Lab, Massachusetts Institute of Technology (MIT)
- 2022 *Medial temporal lobe contributions to visual object perception*, Vision Journal Club, New York University
- 2022 *Understanding memory-related behaviors: From psychological constructs to function approximation*, Princeton Neuroscience Institute
- 2021 *"Is the medial temporal lobe involved in perception?" Situating lesion and electrophysiological data within a deep learning framework*. Johns Hopkins Early Career Colloquium
- 2021 *Using biologically plausible computational models to formalize MTL involvement in perception*. Preston Lab, UT Austin, Center for Learning and Memory
- 2021 *Biologically plausible computational models of perception, formalizing theories of medial temporal lobe function, and routes to emotion-related research—oh my!* Dunsmoor Lab, UT Austin
- 2021 *When the ventral visual stream is not enough: A deep learning account of medial temporal lobe involvement in perception*. Neuro area weekly seminar, Stanford University
- 2020 *Identifying neuroanatomical substrates that enable humans to outperform computational models of vision*. Facebook Artificial Intelligence Research (FAIR)
- 2020 *Formalizing the involvement of the medial temporal lobe in perception: From psychological constructs to function approximation*. Saxelab, Massachusetts Institute of Technology (MIT)
- 2020 *Is the medial temporal lobe involved in perception? Formalizing perceptual demands in concurrent visual discrimination tasks*. National Institute of Mental Health, Bethesda, MD
- 2019 *Traces: On Lines, Memory, and Threads*. Materia, Division of Literatures, Cultures, and Languages Focal Unit. Stanford University, Co-presented with Robalino, M.G.
- 2019 *How does an experience become a memory? Information processing in the brain, from perceptual encoding to conscious recollection*. Wonderfest, San Francisco, CA
- 2019 *Mnemonic Representations: from taxonomies and constructs to function approximation*. Interdisciplinary workshop Locating Representations in the Brain, Stanford University
- 2019 *Formalizing involvement of the Medial Temporal Lobe in perceptual tasks: A meta-analytic, computational, and behavioral approach*. Neuro area weekly seminar, Stanford University
- 2016 *Social structure learning: Relating formal models of learning to vicarious fear conditioning*. Affective area seminar, Stanford University

### **CONFERENCE PRESENTATIONS**

- 2022 *Complementary Learning Systems supporting 3D object perception*, Shared Visual Representations in Humans and Machines (SVRHM), NeurIPS
- 2022 *Neural and behavioral constraints on human visual reasoning; a case study from 3D object perception*, Beyond Bayes: Paths Towards Universal Reasoning Systems, ICML
- 2021 *When the ventral visual stream is not enough: A deep learning account of medial temporal lobe involvement in perception*. Black in Neuro Conference, Virtual
- 2019 *A stimulus-computable model of inferior temporal cortex predicts perceptual demands on perirhinal cortex*. Bay Area Memory Meeting, San Jose State University, CA

- 2019 *Disambiguating the role of perirhinal cortex in perception: A biologically plausible computational approach.* Nanosymposium talk at the Society for Neuroscience (SfN), Chicago, IL
- 2013 *'Speechless' Terror: the Neural and Social Correlates of Trauma, Language, and Sensation.* Minding the Body: Dualism and Its Discontents, English Student Association, Graduate Student Conference, CUNY

### **POSTER PRESENTATIONS**

- 2022 Bonnen, T., Yamins, D, Wagner, A. *The medial temporal lobe enables visual perception not possible 'at a glance'* Cognitive Computational Neuroscience (CCN), San Francisco
- 2021 Bonnen, T., Yamins, D, Wagner, A. *Formalizing Medial Temporal Lobe involvement in perception: From psychological constructs to function approximation.* Cognitive Neuroscience Society (CNS), Virtual
- 2020 Wang, S., Jiang, J., Bonnen, T., Iyer, C., Wagner, A. *Similarity structure of semantic knowledge modulates variability in episodic memory behavior through cortical-hippocampal interactions.* Cognitive Neuroscience Society (CNS), Virtual
- 2020 Bonnen, T., Yamins, D, Wagner, A. *Formalizing a Perceptual-Mnemonic Theory of the Medial Temporal Lobe.* Computational and Systems Neuroscience (Cosyne), Denver, CO
- 2019 Bonnen, T., Yamins, D, Wagner, A. *Formalizing a Perceptual-Mnemonic Theory of the Medial Temporal Lobe.* Cognitive Computational Neuroscience (CCN), Berlin, Germany
- 2018 Bonnen, T., Yamins, D., Wagner, A. *A stimulus-computable model of inferior temporal cortex predicts perceptual demands on perirhinal cortex.* Bay Area Memory Meeting, San Jose State University, CA

### **RESEARCH EXPERIENCE**

- 2016 PhD Candidate, co-advised by Anthony Wagner and Daniel Yamins, Stanford University  
Biologically plausible computational models of medial temporal lobe involvement in perception
- 2014 Research Fellow with Rebecca Saxe: Department of Brain and Cognitive Science, MIT  
Multivariate analyses with human neuroimaging data
- 2014 Research Scientist with Daniel Margulies, Max Planck Institute's Neuroanatomy and Connectivity Group  
Identifying principles of cortical organization with a large scale resting state data
- 2010 Research Aid in Leadership Computing Facility Division with John Hammond, Argonne National Lab, IL  
Modeling the intercalation of lithium ions onto graphene using DFT computational methods
- 2008 Summer Undergraduate Research Fellow with John Doerty, NIST, Gaithersburg, MD  
Methods for device fabrication and characterization of a prototypical organic donor-acceptor interface.
- 2004 Clinical Massage Therapist with Tiffany Fields, Touch Research Institute, Miami, FL  
Cataloging physiological benefits of touch in preterm infants, depressed pregnant mothers, AIDS patients

### **TEACHING EXPERIENCE**

- 2020 Teaching Assistant, *Models and Mechanisms of Memory*, Stanford University
- 2020 Teaching Assistant, *Statistical Methods for Behavioral and Social Science*, Stanford University
- 2019 Instructor, Inspirit AI in Delhi, Mumbai, and Dubai
- 2019 Teaching Assistant, *Introduction to Statistical Methods*, Stanford University
- 2017 Instructor, Center For Brain Minds and Machines Summer School, MIT
- 2012 Teacher's Assistant, Organic Chemistry Laboratory, Columbia University
- 2012 Curriculum Consultant, The Center for Intersectionality, Columbia University
- 2010 Student Intern & Coordinator, Men's Peer Educator, Columbia University
- 2004 Pedagogical Instructor, Humana People to People, Angola & South Africa

### **SERVICE TO THE PROFESSION**

- 2021 Reviewer: Cosyne, Cerebral Cortex, Cognitive Computational Neuroscience, Neuropsychologia, Shared

Visual Representations in Human and Machine Intelligence (SVRHM) NeurIPS Workshop

**SERVICE TO THE INSTITUTION**

- 2021 Wu Tsai Neuroscience Institute Diversity Inclusion Belonging Equity and Justice (DIBEJ) Committee
- 2020 Mind, Brain, Computation, and Technology Seminar Series, Organizer
- 2020 BELONG (BIPOC Emerging Leaders of the Next Generation), Co-founder and Organizer
- 2018 Stanford University Building Naming Committee, Member
- 2018 Men and Masculinities Project, a program within the Women's Community Center, Organizer
- 2016 Frisem (Neuroscience/Cognitive Areas) Seminar Series, Organizer
- 2017 Psychology Diversity Committee, Member
- 2016 Affective Seminar Series, Organizer

**PUBLIC WRITING**

- 2021 Stanford Daily, [Developing a Transformative Justice Response to Racism on Campus](#)
- 2020 Stanford Daily, [Failure to protect subcontracted workers could have disastrous public health consequences](#)
- 2013 Choice Words Blog, Unite for Reproductive and Gender Equity, [Masculinity and Care](#)

**MEDIA**

- 2021 Stanford HAI, [How Artificial Neural Networks Help Us Understand Neural Networks in the Human Brain](#)

**MENTORSHIP**

- 2021 Chris Iyer: Mentorship for undergraduate thesis work at Stanford <csiyer@stanford.edu>
- 2020 Anmol Dhaliwal: High school scientific mentorship; transition to university <v07135anmol@dpsrpk.net>
- 2019 Ayesha Nadiadwala: Transition to graduate school <anadiadwala@utexas.edu>
- 2018 Kylo Littlejohn: Transition to four-year university and graduate school <kl3092@columbia.edu>
- 2017 Mina Caraccio: Scientific mentorship during highschool <mina.caraccio@yale.edu>

**REFERENCES**

- Dr. Anthony Wagner, Stanford University <awagner@stanford.edu>
- Dr. Daniel Yamins, Stanford University <yamins@stanford.edu>
- Dr. Jay McClelland, Stanford University <jlmcc@stanford.edu>
- Dr. Morgan Barensse, University of Toronto <morgan.barensse@utoronto.ca>