LUCY L. W. OWEN

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EXPERIENCE

Assistant Professor, University of Montana 2024 - present
Department of Computer Science

Postdoctoral fellow, Brown University Carney Institute 2021 - 2024
PI: Dr. Frederike Petzschner

Parental leave (2-month full-time caregiver for infant baby, Jan 2023 to March 2023)

Ph.D. student, Dartmouth College 2016 - 2021
PI: Dr. Jeremy Manning

Intern, Facebook Reality Labs June 2020 - December 2020
Nascent Research intern with a focus on adaptive experimentation, reporting to Michael Shvartsman.

Lab manager, Columbia University 2014 - 2016
PI: Dr. Daphna Shohamy

Research assistant, Columbia University Teachers College 2013 - 2015
PI: Dr. Peter Gordon

EDUCATION

Dartmouth College *2016 - 2021*
Ph.D.: Psychological and Brain Sciences
Thesis: Modeling the Fast-Timescale Network Dynamics That Underlie Complex Thought

Columbia University, Teachers College *2013 - 2014*
Master of Science: Neuroscience and Education
Thesis: The Role of Dopamine in Memory
Psi Chi, Psychology Honors Organization

Davidson College *2006 - 2010*
Bachelor of Arts
Major in Studio Art, Minor in Chemistry, Pre-Medicine Concentration

GRANTS AND AWARDS

NSF EPSCoR Grant *2024*
SMART FIRES: Sensors, Machine Learning, and Artificial Intelligence in Real Time Fire Science.
Award amount: $20,000,000; Role: Co-I(PI: Robert Walker)

Kirschstein-NRSA postdoctoral award 1F32DA061598-01 *2024*
Computational assessment of avoidance learning in chronic pain
Declined because of conflicting faculty appointment.

Neukom Prize for Outstanding Graduate Research in Computational Science *2020*

PUBLICATIONS

Owen LLW, Manning JR (2024) High-level cognition is supported by information-rich but compressible brain activity patterns. *PNAS*, 121 (35) e2400082121. doi: 10.1073/pnas.2400082121.

Gunsilius CZ, Heffner J, Bruinsma S, Corinha M, Cortinez M, Dalton H, Duong E, Lu J, Omar A, **Owen LLW**, Roarr BN, Tang K, Petzschner FH (2024) SOMAScience: A novel platform for multidimensional, longitudinal pain assessment. *JMIR mHealth and uHealth*, 12:e47177.

Lahlou S, Gabitov E, **Owen LLW**, Shohamy D, Sharp M, (2022, March) Preserved motor memory in Parkinson's disease. *Neuropsychologia*, 3:167.

Owen LLW, Chang TH, Manning JR (2021) High-level cognition during story listening is reflected in high-order dynamic correlations in neural activity patterns. *Nature Communication*, 12(1):5728.

Scangos KW, Khambhati AN, Daly PM, **Owen LLW**, Manning JR, Ambrose JB, Austin E, Dawes HE, Krystal AD,Chang EF (2021) Distributed subnetworks of depression defined by direct intracranial neurophysiology. *Frontiers in Human Neuroscience*, 15:561.

Owen LLW, Browder J, Letham B, Stocek G, Tymms C, Shvartsman M, (2021, April) Adaptive nonparametric psychophysics. *arXiv*: 2104.09549.

Owen LLW, Muntianu TA, Heusser AC, Daly P, Scangos K, Manning JR (2020, April) A Gaussian process model of human electrocorticographic data. *Cerebral Cortex*: 30(10), 5333-5345.

Heusser AC, Ziman K, **Owen LLW**, Manning JR (2018) HyperTools: A Python toolbox for gaining geometric insights into high-dimensional data. *Journal of Machine Learning Research*, 18(152): 1 - 6.

TALKS

Owen LLW (2024, October) Visualizing and gaining geometric insights into high dimensional data *Presented at the AI in Research and Education Symposium - Montana INBRE Data Science Core and Montana Technological University.* Butte, MT.

Owen LLW (2024, May) Characterizing properties of brain activity. *Presented to the Neuroscience Program at University of Montana* Missoula, MT.

Owen LLW (2024, May) Characterizing properties of brain activity. *Presented to the University of Montana Computer Science department.* Missoula, MT.

Owen LLW (2022, April) Avoidance in chronic pain patients. *Grant presentation to T32 faculty.* Providence, RI.

Owen LLW (2022, March) Ten simple rules for computational modeling of behavioral data. *Python tutorial for ESM journal club.* Providence, RI.

Owen LLW (2021, December) Modeling the fast-timescale network dynamics. *Invited presentation to Dr. Travis Wheeler's lab meeting.* Missoula, Montana.

Owen LLW (2021, November) Modeling the fast-timescale network dynamics that underlie complex thought. *Public Defense* Hanover, NH.

Owen LLW (2021, May) Fast timescale network dynamics in complex thought. *Invited presentation to Brown University.* Providence, RI.

Owen LLW (2021, May) How do high-order brain network dynamics support narrative understanding? *Canadian Computational Neuroscience Spotlight* Canada.

Owen LLW (2020, December) Adaptive experimentation for psychophysics. *Facebook reality labs.* Redmond, Washington.

Owen LLW (2020, September) Scalable multi-dimensional psychophysics experiment. *Facebook reality labs.* Redmond, Washington.

Owen LLW (2020, July) Characterizing properties of brain activity. *Facebook reality labs.* Redmond, Washington.

Owen LLW (2020, June) A Gaussian process model of human electrocorticographic data. *Invited presentation to Dr. Robert Knight's lab meeting.* Berkeley, California.

Owen LLW (2020, June) Understanding interactivity of brain patterns through higher-order correlations. *Invited presentation to Drs.Olaf Sporns and Richard Betzel's joint lab meeting.* Bloomington, Indiana. Virtually presented. Link to video.

Owen LLW (2020, May) Decoding complexity from neural data. *Cognitive Brown Bag.*

Owen LLW (2020, April) A Gaussian process model of human electrocorticographic data. *Cognitive Neuroscience Society Meeting.* Virtually presented. Link to video.

Owen LLW (2019, August) Introduction to Docker. *Methods in Neuroscience at Dartmouth*, Hanover, NH. Link to video.

Owen LLW (2019, July) Data Blitz. *EPSCoR Womens' Conference*, Pray, MT.

Owen LLW (2019, March) Decrypting the neural code. *Cognitive Brown Bag*, Lebanon, NH.

Owen LLW (2019, March) Seizure tracking using Supereeg. *Dartmouth Hitchcock Medical Center*, Lebanon, NH.

Owen LLW, Heusser AC, Sperling M, Lega B, Worrell G, Gross R, Jobst B, Davis K, Zaghloul KA, Sheth S, Stein J, Das S, Gorniak R, Manning JR (2018, November) Fast timescale network dynamics underlying episodic encoding and retrieval. *Society for Neuroscience annual meeting*, San Diego, CA.

Owen LLW (2018, October) Fast timescale network dynamics underlying episodic encoding and retrieval using SuperEEG. *Dartmouth Hitchcock Medical Center*, Lebanon, NH.

Owen LLW (2018, October) Timecorr: Dynamic correlations and higher order correlations. *Contextual Dynamics Lab meeting*, Hanover, NH.

Owen LLW, Goldstien A (2018, August) Audio correlations with predicted ECoG activity. *Methods in Neuroscience at Dartmouth*, Hanover, NH.

Owen LLW (2018, August) Introduction to Docker. *Methods in Neuroscience at Dartmouth*, Hanover, NH. Link to video.

Owen LLW (2018, July) Data Blitz. *EPSCoR Womens' Conference*, Providence, RI.

Owen LLW (2018, May) Pycharm: Debugging, and Docker Integration. *Contextual Dynamics Lab meeting*, Hanover, NH.

Owen LLW (2018, April) Specialist departmental presentation. *Department of Psychological and Brain Sciences, Dartmouth College*, Hanover, NH.

Owen LLW (2018, April) Lecture: Memory. *Psychology I, Dartmouth College*, Hanover, NH.

Owen LLW (2018, March) Lecture: Learning. *Psychology I, Dartmouth College*, Hanover, NH.

Owen LLW (2018, March) Testing and Continuous Integration in Python. *Contextual Dynamics Lab meeting*, Hanover, NH.

Owen LLW (2017, October) Lecture: Memory. *Psychology I, Dartmouth College*, Hanover, NH.

Owen LLW (2017, September) Lecture: Learning. *Psychology I, Dartmouth College*, Hanover, NH.

Owen LLW (2018, September) SuperEEG updates. *Contextual Dynamics Lab meeting*, Hanover, NH.

Owen LLW (2017, June) Towards human SuperEEG. *Dartmouth Hitchcock Medical Center*, Lebanon, NH.

POSTER PRESENTATIONS

Owen LLW Manning JR (2024, May). High-level cognition is supported by information-rich but compressible brain activity patterns *Context and Episodic Memory Symposium*, Philadelphia, PA.

Muntianu TA **Owen LLW** Manning JR (2020, April). A Gaussian process model of human electrocorticographic data. *Cognitive Neuroscience Society Meeting*, virtually presented.

Owen LLW Manning JR (2020, April). Understanding brain pattern complexity and interactivity in naturalistic processing. *Cognitive Neuroscience Society Meeting*, virtually presented. Link to video.

Owen LLW Manning JR (2019, October). Understanding complexity and interactivity of brain patterns in naturalistic processing. *Society for Neuroscience annual meeting*, Chicago, IL.

Owen LLW Manning JR (2019, May). An examination of the higher-order dynamic interactions underlying multi-dimensional timeseries data. *Nework NetSci Conference*, Burlington, VT.

Owen LLW Manning JR (2017, November). A Gaussian process model of human ECoG data. *Society for Neuroscience annual meeting*, Washington, DC.

Heusser AC, Ziman K, **Owen LLW**, Manning JR (2017, November). HyperTools: A python toolbox for gaining geometric insights into high-dimensional data. *Society for Neuroscience annual meeting*, Washington, DC.

Owen LLW, Manning JR (2017, May) Towards human Super EEG. *Context and Episodic Memory Symposium*, Philadelphia, PA.

Heusser AC, Ziman K, **Owen LLW**, Manning JR (2017, May) HyperTools: A Python toolbox for visualizing and manipulating high-dimensional data. *Context and Episodic Memory Symposium*, Philadelphia, PA.

Owen LLW, Manning JR (2017, April) Towards human Super EEG. *Graduate student poster session*, Dartmouth College, Hanover, NH.

Owen LLW, Sharp ME, Shohamy D (2016, April) Acquisition and consolidation of motor sequence learning in Parkinsons disease. *Cognitive Neuroscience Society Meeting*, New York, NY.

Gordon P, Kim S, Paz ML, Reddick E, **Owen LLW** (2014, April) The neural basis of parallel individuation and numerical estimation. *Cognitive Neuroscience Society Meeting*, Boston, MA.

Kim S, **Owen LLW**, Levinson H, Paz ML, Gordon P (2014, April) Functional links of neural correlates of word meaning: Behavioral and Neurophysiological Evidence. *Cognitive Neuroscience Society Meeting*, Boston, MA.

SOFTWARE

SOMA. A mobile App to monitor bodily symptoms. Link to App website

aePsych. A Python toolbox for adaptive experimentation in psychophysics and perception research, built on top of gpytorch and botorch. Link to toolbox

Timecorr. A Python toolbox for calculating dynamic correlations and exploring higher order correlations. Link to toolbox

SuperEEG. A Python toolbox for inferring whole-brain activity from sparse ECoG recordings. Link to toolbox

HyperTools. A python toolbox for gaining geometric insights into high-dimensional data. Link to toolbox

SERVICE

Student Evaluation Committee (SEC) 2024 - ongoing
Faculty member.

Brainstorm Challenge: EEG Summer, 2022
Teaching assistant.

RLDM Conference Summer, 2022
Attendee.

Chronic Pain Journal Club 2021 - 2022
Organizer.

Kavli Summer institute Summer, 2019
Attendee.

MIND Summer School Summer, 2019
Teaching assistant.

EPSCoR Womens conference Summer, 2019
Attendee.

Graduate representative, cognitive area 2018 - 2020
Liaison between graduate students and faculty as well as host for prospective graduate students.

EPSCoR Womens conference Summer, 2018
Attendee.

TEACHING EXPERIENCE

Professor Fall, 2024
University of Montana, Computational Cognitive Neuroscience
Senior undergraduate and graduate level course.

Professor Fall, 2024
University of Montana, Machine Learning
Senior undergraduate and graduate level course.

Teaching Assistant Spring, 2019
Dartmouth College, Experimental Psychology
Course taught by Dr. Catherine Cramer

Teaching Assistant Spring, 2018
Dartmouth College, Psychology I
Course taught by Drs. Thalia Wheatly and Brad Duchaine

Teaching Assistant Fall, 2017
Dartmouth College, Psychology I
Course taught by Drs. Thalia Wheatly and Brad Duchaine

Teaching Assistant Summer, 2017
Dartmouth College, Experimental Psychology
Course taught by Dr. Jeremy Manning

Teaching Assistant Spring, 2014
Columbia University, Teachers College, Brain and Behavior II
Course taught by Dr. Peter Gordon

REFERENCES

1. Name: Jeremy Manning
   Email: Jeremy.R.Manning@dartmouth.edu
   Degree: PhD

Title: Associate Professor
Affiliation: Dept. of Psychological and Brain Sciences, Dartmouth College

2. Name: Frederike Petzschner
   Email: frederike_petzschner@brown.edu
   Degree: PhD
   Title: Assistant Professor
   Affiliation: Dept. of Psychiatry and Human Behavior, Carney Institute for Brain Science at Brown University

3. Name: James Haxby
   Email: James.V.Haxby@dartmouth.edu
   Degree: PhD
   Title: Professor
   Affiliation: Dept. of Psychological and Brain Sciences, Dartmouth College