LUCY LAI

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EDUCATION

HARVARD UNIVERSITY, CAMBRIDGE, MA — 2018 –
Ph.D. in Neuroscience

RICE UNIVERSITY, HOUSTON, TX — 2014 – 2018
B.A. in Cognitive Sciences with Honors
Minors in Neuroscience, Computational and Applied Mathematics
Distinction in Research and Creative Work | Thesis: *Multisensory context warps time perception*

AWARDS &HONORS

National Science Foundation Graduate Research Fellowship	2018 – 2023
Phi Beta Kappa National Honor Society	2018
Rice University Student-Taught Course (STC) Teaching Award	2017
Cognitive Computational Neuroscience student travel award	2017
Janelia Undergraduate Scholars Program Fellowship	2017
Barry M. Goldwater Scholarship honorable mention	2017
Center for Sensorimotor Neural Engineering (CSNE) NSF-REU Fellowship	2016
Computational and Systems Neuroscience (Cosyne) undergraduate travel award	2016
Rice Undergraduate Scholars Program thesis grant	2016 – 2018

RESEARCH

HARVARD UNIVERSITY, CAMBRIDGE, MA — JUN 2019 –
Computational Cognitive Neuroscience Lab, Department of Psychology
Advisor: Samuel Gershman

- Developing and testing computational theories of learning. Thesis lab.

MARINE BIOLOGICAL LABORATORY, WOODS HOLE, MA — AUG 2019
The Center for Brains, Minds, and Machines (CBMM) Summer School

- Investigating the emergence of representational specificity during continual learning in multi-layer convolutional neural networks.

BAYLOR COLLEGE OF MEDICINE, HOUSTON, TX — JAN 2015 – JUN 2018
Department of Neuroscience
Advisor: Jeffrey Yau

- Designed behavioral experiments and built computational models to understand how context influences time perception across the senses. Undergraduate thesis lab.

JANELIA RESEARCH CAMPUS, ASHBURN, VA — JUN 2017 – AUG 2017
Janelia Undergraduate Scholars Program
Advisor: Joshua Dudman

- Used *in-vivo* neural recordings to understand how the motor cortex and striatum represent the kinematics of motor behaviors during reward-seeking actions.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY, CAMBRIDGE, MA — JUN 2016 – AUG 2016
Center for Sensorimotor Neural Engineering NSF-REU, McGovern Institute for Brain Research
Advisor: Mehrdad Jazayeri

- Designed behavioral experiments and built Bayesian inference models to understand the role of memory in sensorimotor control.

PUBLICATIONS& PRESENTATIONS

Lai, L., Magnotti, JF., Yau, JM. *Conditioned inference warps multisensory time perception.* In preparation.

Lai, L., Pho, GN., Ölveczky, BP., Gershman, SJ. *A computational division of labor for motor skill learning.* From Neuroscience to Artificially Intelligent Systems (NAISys) meeting, Cold Spring Harbor, NY. Submitted.

Mikhael, JG, **Lai, L.,** Gershman, SJ. *Rational inattention and tonic dopamine.* Submitted.

Lai, L., Magnotti, JF., Yau, JM. *Multisensory context warps time perception*. Cognitive Computational Neuroscience (CCN) meeting, New York, NY, conference paper: September 7, 2017.

Lai, L., Dudman, JT. *Neural correlates of action kinematics in the dorsal striatum.* Janelia Undergraduate Scholars symposium, Ashburn, VA, poster: August 3, 2017.

Lai, L., Magnotti, JF., Yau, JM. *Contextual determinants of cue binding or separation in multisensory time perception.* International Multisensory Research Forum (IMRF) annual meeting, Nashville, TN, poster: May 21, 2017.

Lai, L., Yau, JM. *Attractive and repulsive multisensory interactions in time perception.* Society for Neuroscience (SfN) annual meeting, San Diego, CA, poster: November 14, 2016.

Lai, L., Jazayeri, M. *Characterizing variability in memory recall of time intervals.* Center for Sensorimotor Neural Engineering (CSNE) REU Symposium, Seattle, WA, poster: August 17, 2016.

TEACHING

Teaching Assistantships

Roles in which I helped design/grade problem sets, held office hours, led recitations, and/or proctored exams.

TEACHING FELLOW F 2019

Department of Neurobiology, Harvard Medical School

- NB316QC: Helping design and write problem sets for a new graduate course on the probabilistic modeling of neural data.

TEACHING ASSISTANT MAR 2019

Computational and Systems Neuroscience Conference Tutorial

- Helped design and teach computational exercises at the 2019 Cosyne conference tutorial on Bayesian modeling of behavior.

TEACHING ASSISTANT

Departments of Psychology, Statistics, Biosciences, Rice University

- NEUR/PSYC 362: Cognitive Neuroscience S 2016, S 2017, S 2018
- NEUR/CAAM 416: Neural Computation S 2018
- NEUR/BIOC 385: Cellular and Molecular Neuroscience F 2016
- STAT 310: Probability and Statistics F 2016
- PSYC 203: Cognitive Psychology F 2015

Course Design

Courses that I have personally designed (curriculum, problem sets, etc.) and taught from scratch.

NB314QC: MATH TOOLS FOR NEUROSCIENCE JAN 2020

Department of Neurobiology, Harvard Medical School

- Designing and teaching a new J-term course for the Neuroscience Ph.D. program curriculum. Topics include fundamentals of linear algebra, probability theory, statistical estimation and inference in neural circuits, and analysis of neural population data.

COLL158: HOW MUSIC PLAYS THE BRAIN S 2017, F 2017, S 2018

Rice University

- Designed and taught a seminar course on the intersection of music and neuroscience. Topics include the neurobiology of music perception and cognition, music therapy, AI and music, etc. Recipient of the 2017 Rice Student-Taught Course Award!

OUTREACH &SERVICE

STEM Education Outreach

Roles where I have helped with curriculum development, mentoring, and teaching for (often underserved) city-area middle- and high-school students.

HPREP Curriculum and Teaching Team, Harvard Medical School 2018 –
BrainSTEM, KIPP Sunnyside High School, Houston, TX 2015 – 2017
Splash, Rice University 2017

Academic Mentorship

Roles where I have tutored or mentored students within an academic institution. Includes planning 4-year course curricula, helping with research internship/graduate school/fellowship applications, etc.

Mind, Brain, Behavior (MBB) Graduate Student Mentor, Harvard University 2019 –
Alumni Externship Advisor, Rice University 2018 –
Head Academic Fellow, Lovett College, Rice University 2016 – 2018
Curriculum Advisor, Rice Neuroscience Society, Rice University 2015 – 2018
Orientation Week Advisor, Lovett College, Rice University 2015

Peer Reviewing

NeurIPS Biological and Artificial Reinforcement Learning Workshop, Vancouver, BC 2019

LEADERSHIP &PROFESSIONAL

Alumni Interviewer, Rice University 2018 –
Head Academic Fellow, Lovett College, Rice University 2016 – 2018
Catalyst Executive Editor, Rice Undergraduate Science Research Journal 2014 - 2016
Conference Organizer, Exploring the Mind through Music Conference, Rice University 2016
Alumni Week Coordinator, Lovett College, Rice University 2016
Urban Immersion Coordinator, Center for Civic Leadership, Rice University 2014 – 2015
Tour Guide, Welcome Center, Rice University 2014 – 2015

SKILLS &OTHER

Programming: MATLAB, Python, PyTorch, Tensorflow, Javascript, HTML/CSS
Lab: psychophysics, Amazon MTurk, *In-vivo* acute electrophysiology, rodent behavior
Interests: classical music, philosophy of science and religion, poetry, long-distance running, coffee