LUCY LAI

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ACADEMIC POSITIONS

University of California, San Diego (UCSD), La Jolla, CA — 2025 –
Assistant Teaching Professor
Department of Cognitive Science

Okinawa Institute of Science and Technology, Okinawa, JP — 2023 – 2025
Theoretical Sciences Visiting Program (TSVP) Scholar

EDUCATION

Harvard University, Cambridge, MA — 2018 – 2024
Ph.D. in Neuroscience
Teaching Certificate, Derek Bok Center for Teaching and Learning

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

RESEARCH POSTITIONS

Harvard University, Cambridge, MA — JUN 2019 – MAY 2024
Department of Psychology and Center for Brain Science
Advisor: Samuel Gershman

University College London, London, UK — JUN – AUG 2022
Max Planck UCL Centre for Computational Psychiatry and Ageing Research
Advisors: Quentin Huys and Tobias Hauser

Baylor College of Medicine, Houston, TX — JAN 2015 – JUN 2018
Department of Neuroscience
Advisor: Jeffrey Yau

Janelia Research Campus, Ashburn, VA — JUN – AUG 2017
HHMI Janelia Undergraduate Scholars Research Program
Advisor: Joshua Dudman

Massachusetts Institute of Technology, Cambridge, MA — JUN – AUG 2016
Center for Sensorimotor Neural Engineering NSF-REU
Advisor: Mehrdad Jazayeri

Summer Schools

NSAS Computational Psychiatry Summer School, Venice, Italy — JUN 2022
Center for Brains, Minds, and Machines (CBMM) Summer School, Woods Hole, MA — AUG 2019

AWARDS &HONORS

HMS Department of Neurobiology Service Award	2022
MAHPING Pedagogy Fellowship	2022
Harvard University Certificate of Distinction in Teaching	2021, 2022
Phi Beta Kappa National Honor Society	2018
Rice University Student-Taught Course Teaching Award	2017
Cognitive Computational Neuroscience Student Travel Award	2017
Barry M. Goldwater Scholarship Honorable Mention	2017
Computational and Systems Neuroscience (COSYNE) Undergraduate Travel Award	2016

GRANTS& FELLOWSHIPS

Harvey Fellowship ($48,000)	2022 – 2024
Harvard Mind, Brain, Behavior (MBB) Graduate Student Award ($8560)	2021
National Science Foundation Graduate Research Fellowship ($114,000)	2018 – 2021
Rice Undergraduate Scholars Program Thesis Grant ($1000)	2016 – 2018

PUBLICATIONS

Lai, L., Hauser, T., Huys, Q. (in prep). A computational account of egodystonia.

Lai, L., Bhatia, C., Hardcastle, K., Mizes, K., Ölveckzy, BF., Gershman, SJ. (in prep). Policy regularization enables robustness and flexibility in motor sequence learning.

Lai, L.*, Huang, AZX.*, Gershman, SJ. (in press). Action chunking as conditional policy compression. *Cognition.*

Liu, S. **Lai, L.**, Gershman, SJ. Bari, BA. (in press). Time and memory costs jointly determine a speed-accuracy trade-off and set-size effects. *Journal of Experimental Psychology: General.*

Lai, L. (2024). Policy compression: acting with limited cognitive resources. *Ph.D. Thesis, Harvard University*

Lai, L., Gershman, SJ. (2024). Human decision making balances reward maximization and policy compression. *PLOS Computational Biology.*

Gershman, SJ., **Lai, L.** (2021). The reward-complexity trade-off in schizophrenia. *Computational Psychiatry.*

Lai, L., Gershman, SJ. (2021). Policy compression: an information bottleneck in action selection. *Psychology of Learning and Motivation, Volume 74.*

Bhui, R., **Lai, L.**, Gershman, SJ. (2021). Resource-rational decision making. *Current Opinion in Behavioral Sciences.*

Mikhael, JG., **Lai, L.**, Gershman, SJ. (2021). Rational inattention and tonic dopamine. *PLOS Computational Biology.*

Lai, L., Magnotti, JF., Yau, JM. (2017). Multisensory context warps time perception. *Conference on Cognitive Computational Neuroscience.*

CONFERENCE ABSTRACTS

Lai, L., Bhatia, C., Hardcastle, K., Mizes, K., Ölveczky, BP., Gershman, SJ. Policy regularization enables robustness and flexibility in motor sequence learning. *Cognitive Computational Neuroscience 2025, Amsterdam, Netherlands.*

Lai, L., Hauser, T., Huys, Q. Towards a computational account of egodystonia. *CogSci 2025, San Francisco, CA.*

Lai, L., Bhatia, C., Hardcastle, K., Mizes, K., Ölveczky, BP., Gershman, SJ. Policy regularization enables robustness and flexibility in motor sequence learning. *Mathematics of Neuroscience and AI 2024, Rome, Italy*

Lai, L., Gershman, SJ. Policy compression: an information bottleneck in action selection. *Reward and Decision Making 2022, Lake Arrowhead, CA.*

Lai, L., Pho, GN., Ölveczky, BP., Gershman, SJ. A computational division of labor for motor skill learning. *From Neuroscience to Artificially Intelligent Systems (NAISys) 2020, Cold Spring Harbor Laboratory, NY.*

Lai, L., Dudman, JT. Neural correlates of action kinematics in the dorsal striatum. *Janelia Undergraduate Scholars Program Symposium 2017, Ashburn, VA.*

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

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

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

INVITED TALKS

RIKEN Advanced Intelligence Project	JUN 2025
RIKEN Center for Brain Science	JUN 2025
Araya Research, Reinforcement Learning Team	JUN 2025
National University of Singapore, Cognitive Science, Psychology & AI Seminar Series	FEB 2025
Rice University, Omega Psi Honor Society	OCT 2024
5th International Convention on the Mathematics of Neuroscience and AI	MAY 2024
Okinawa Institute of Science and Technology, TSVP Seminar	JAN 2024
Okinawa Institute of Science and Technology, Neural Computation Unit	SEP 2023
Harvey Fellows 30th Reunion	JUN 2023
Tel Aviv University, Shahar Computational Seminar	NOV 2022
RLDM Workshop on Maps in Reinforcement Learning	JUN 2022
Stanford University, Department of Psychology FriSem	MAY 2022
Harvard University, Cognition, Brain, and Behavior Seminar	FEB 2022
McGill University, Otto Lab	NOV 2021
University of Maryland School of Medicine, Gold Lab	OCT 2021
Reinforcement Learning Super Lab	OCT 2021
Brown University, Shenhav Lab	OCT 2021
From Neuroscience to Artificially Intelligent Systems (NAISys)	NOV 2020
Max Planck Institute for Biological Cybernetics, CPI Lab	SEP 2020

TEACHING

Instructor of Record

Independently taught and designed curriculum, problem sets, exams, etc.

University of California, San Diego

Modeling and Data Analysis	Sp 2026
Computational Modeling and Analysis of Human Behavior	Wi 2026
Reinforcement Learning	Fa 2025
Decision Making in the Brain	Su 2024, Sp 2026

Harvard University

From Bench to Bedtime: Entraining Policy to Science	F 2022
Math Tools for Neuroscience	JAN 2020, F 2020

Rice University

How Music Plays the Brain	S 2017, F 2017, S 2018

Teaching Support

Designed & graded problem sets, taught discussion sections, proctored exams, and managed a teaching team.

Harvard University

The Theory and Science of Teaching	F 2022
Artificial and Natural Intelligence	S 2021, S 2022
Math Tools for Neuroscience	F 2020
Quantitative Methods for Biologists	AUG 2020
Probabilistic Modeling of Neural Data	S 2020

Rice University

Cognitive Neuroscience	S 2016, S 2017, S 2018
Neural Computation	S 2018
Cellular and Molecular Neuroscience	F 2016
Probability and Statistics	F 2016
Cognitive Psychology	F 2015

Miscellaneous

Okinawa/OIST Computational Neuroscience Course (OCNC)	JUN 2024
COSYNE Conference Workshop on Bayesian Modeling	MAR 2019

OUTREACH &SERVICE

Academic Mentoring

Advised students in academic matters such as curriculum & career planning, graduate school & fellowship applications, and finding research & internship opportunities.

Resident Tutor, Quincy House, Harvard University 2021 – 2023
Mind, Brain, and Behavior (MBB) Graduate Student Mentor, Harvard University 2019 – 2023
Alumni Externship Advisor, Rice University 2018 – 2020
Head Academic Fellow, Lovett College, Rice University 2016 – 2018

Research Mentoring

Advised the following students on independent research projects.

Sidd Tiwari, Undergraduate Student 2022
Jennifer Guo, Undergraduate Student 2022
Ann Huang, Undergraduate Summer Intern 2021 – 2022
Lily Zheng, PhD Rotation Student 2021
Varshini Subramanian, High School Student 2020 – 2021
Danielah Samson, High School Student 2020 – 2021
Emma Rogge, Undergraduate Student 2020

STEM Outreach

Teaching & mentoring local high school students, often from underserved and underrepresented backgrounds.

SciTalks, Manchester Essex Regional High School & Manchester Neuroscience Society 2021
HPREP Teaching and Mentoring Team, Harvard Medical School 2018 – 2021
BrainSTEM, KIPP Sunnyside High School, Houston, TX 2015 – 2017
Splash, Rice University 2017

Diversity and Inclusion

Founder and Co-Organizer, "Listening Lab" Forum, Harvard Dept. of Neurobiology 2020 – 2022
Committee on Diversity and Inclusion, Harvard Dept. of Neurobiology 2020 – 2022
Harvard Graduate Women in Science and Engineering (HGWISE), Harvard University 2018 – 2020

Peer Reviewing

NeurIPS Biological and Artificial Reinforcement Learning Workshop
Cognitive Science
Cognitive Computational Neuroscience
PLOS Computational Biology

Other

Organizer and Chair, Global Summit on Open Problems for AI, Tokyo, Japan 2025 –
PhD Admissions Consultant 2024, 2025
Student Interviewer, Harvard PhD Program in Neuroscience Admissions 2022, 2023
Organizer, Exploring the Mind through Music Conference, Rice University 2016

SKILLS &OTHER

Languages: English (native), Mandarin Chinese (native), Japanese (beginner)
Programming: Python, MATLAB, Javascript, HTML/CSS, PyTorch
Interests: classical music, poetry, latin dancing, philosophy of science and religion, running, coffee