

LIYU XIA

EMAIL: jimmyxia@math.berkeley.edu

HOME PAGE: xialiyu1995.github.io

EDUCATION

University of California, Berkeley

09/2016 - 05/2021 (expected)

PhD in Applied Mathematics

Advisors: Anne Collins, James Pitman

- Dissertation: State abstraction and temporal abstraction in human reinforcement learning

University of Chicago

09/2012 - 06/2016

BS in Pure and Computational Mathematics (both with honors)

Advisors: Laszlo Babai, Gregory Lawler

CONFERENCES AND PUBLICATIONS

Liyu Xia, Anne Collins. (2019). Behavioral evidence of option transfer and composition in human learning. (in prep)

Liyu Xia, Anne Collins. (2019). Humans flexibly transfer options at multiple levels of abstractions. In *Advances in Neural Information Processing Systems* (NeurIPS). [paper](#). **Contributed talk** in the Biological and Artificial Reinforcement Learning Workshop.

Liyu Xia, Anne Collins. (2019). The options framework enables flexible transfer in humans. In *the Multi-disciplinary Conference on Reinforcement Learning and Decision Making* (RLDM). [paper](#). **Contributed talk**. [talk](#).

Liyu Xia, Anne Collins. (2019). Hierarchical reinforcement learning enables flexible transfer in humans. In *Cognitive Neuroscience Society* (CNS). [poster](#).

Liyu Xia, Anne Collins. (2019). The options framework enables flexible transfer at distinct behavioral hierarchies. In *Sackler Colloquium for Brain Produces Mind by Modeling*. [poster](#).

Liyu Xia, Anne Collins. (2018). Hierarchical reinforcement learning and transfer in humans. In *Society for Neuroscience* (SfN). [poster](#).

Liyu Xia, Mary Kemp, Afzal Hossain, Alexandra Howes. (2016). #Conversations: Customer service through Twitter platform. In *Joint Mathematics Meeting*. [paper](#).

Mackenzie Leake, **Liyu Xia**, Kamil Rocki, Wayne Imaino. (2015). A Probabilistic View of the Spatial Pooler in Hierarchical Temporal Memory. In *International Conference on Artificial Neural Networks (ICANN)*. [paper](#).

Mackenzie Leake, **Liyu Xia**, Kamil Rocki, Wayne Imaino. (2015). Effect of Spatial Pooler Initialization on Column Activity in Hierarchical Temporal Memory. In *AAAI Conference on Artificial Intelligence*. [paper](#).

HONORS AND AWARDS

2019 Outstanding Graduate Student Instructor Teaching Award (**top 10%**)

2019 Berkeley Graduate Division Conference Travel Grant (**\$900 * 2**)

2019 NeurIPS Travel Award (**\$500**)

2019 Sackler Colloquium Travel Award (**\$800**)

2018 Society for Neuroscience Trainee Professional Development Award (**\$1000**)

2016 Phi Beta Kappa (**GPA: 3.9/4.0**)

2015 Dean's fund for travel to ICANN Conference (**\$1700**)

GRADUATE STUDENT INSTRUCTOR

MATH 1B: Calculus	Fall 2016 - Fall 2017
MATH 16B: Analytic Geometry and Calculus	Spring 2018
COG SCI 1: Introduction to Cognitive Science	Spring 2019

OTHER POSITIONS

RIKEN Brain Science Institute	Summer 2017
<i>Research Intern</i>	<i>Advisors: Tomoki Fukai, Tomoki Kurikawa</i>

- Probed individual difference of decision making in rats
- Simulated neural trajectory using STDP and RL in RNN to explain individual difference in rats

University of California, Los Angeles, Research in Industrial Projects for Students	Summer 2015
<i>Research Intern</i>	<i>Advisors: Roja Bandari, Brian Kim</i>

- Analyzed 40 million tweets for Twitter as a platform for conducting customer service
- Presented results to CTO at Twitter Headquarter

IBM Almaden Research Center	Summer 2014
<i>Research Intern</i>	<i>Advisors: Wayne Imano, Kamil Rocki</i>

- Formulated a probabilistic framework for the Spatial Pooling phase of Hierarchical Temporal Memory (HTM), a brain-inspired online unsupervised learning algorithm
- Presented to senior IBM fellows on a weekly basis and at Numenta (whose founder Jeff Hawkins proposed HTM)

GRANT WRITING

Co-author of awarded NIH grant (R01MH119383-01): The neural computations supporting hierarchical reinforcement learning

UNDERGRADUATES MENTORED

Katya Brooun, Flora Dong, Sabrina Ni, Wendy Shi

SKILLS

Programming: MatLab, Python, R, STAN, Javascript (jspsych)

Language: Chinese, English, Japanese