

# Ji-An Li

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School of Medicine  
University of California, San Diego  
9500 Gilman Dr. La Jolla, CA 92093

Email: [jl095@ucsd.edu](mailto:jl095@ucsd.edu)  
[Personal Website](#)  
[Google Scholar Page](#)

Research Interests	Computational Neuroscience, Large Language Model Interpretability	
Education	University of California, San Diego	California, USA
	<b>Doctoral Study</b> in Neurosciences	2020 – Present
	Advisor: <a href="#">Marcelo Mattar</a> , <a href="#">Marcus Benna</a>	
	University of Science and Technology of China	Anhui, China
	<b>M.S.</b> in Applied Statistics	2016 – 2019
	Advisor: <a href="#">Xiaochu Zhang</a>	
	<b>B.S.</b> in Biological Science	2012 – 2016
	Advisor: <a href="#">Xiaochu Zhang</a>	
	Shitsan Pai Talent Program in Life Sciences (Honor)	
	<b>B.E.</b> in Computer Science and Technology (Dual)	2012 - 2016
	Advisor: <a href="#">Shangfei Wang</a>	
Honors	Interpretability Hackathon 3.0, First Place	2023
	Innovative Research Grants Award (Kavli Institute, UCSD)	2022
	Outstanding Research Paper Award (USTC)	2020
	Graduate Scholarship, Grade 1 (USTC)	2018
	Suzhou Industrial Park Scholarship (USTC)	2017
	Outstanding Undergraduate Thesis (USTC)	2016
	Guo Moruo Scholarship (USTC, Highest Honor)	2015
	National Scholarship (Chinese Ministry of Education)	2014
	Outstanding Student Scholarship, Gold Medal (USTC)	2013
	Outstanding Freshman Scholarship (USTC)	2012
	China High School Biology Olympiad, Nationwide, Silver Medal	2011
	China High School Biology Olympiad, Anhui Province, First Prize	2011
	National Olympiad in Informatics, Anhui Province, First Prize	2010
Publications	<a href="#">L Ji-An</a> , MK Benna. Deep Learning without Weight Symmetry. <i>arXiv</i> .	2024
	<a href="#">L Ji-An*</a> , C Zhou*, MK Benna <sup>†</sup> , MG Mattar <sup>†</sup> . Linking In-context Learning in Transformers to Human Episodic Memory. <i>arXiv</i> .	2024
	<a href="#">L Ji-An</a> , MK Benna, MG Mattar. Automatic Discovery of Cognitive Strategies with Tiny Recurrent Neural Networks. <i>bioRxiv</i> .	2023
	<a href="#">L Ji-An</a> , F Stefanini, MK Benna, S Fusi. Face familiarity detection with complex synapses. <i>iScience</i> .	2023
	M Molano-Mazón, J Barbosa, J Pastor-Ciurana, M Fradera, RY Zhang, J Forest, J Pozo, <a href="#">L Ji-An</a> , CJ Cueva, J Rocha, D Narain, GR Yang. NeuroGym: An open resource for developing and sharing neuroscience tasks. <i>PsyArXiv</i> , <i>aqc9n</i> .	2022
	<a href="#">JA Li</a> , D Dong, Z Wei, Y Liu, Y Pan, F Nori, X Zhang. Quantum Reinforcement Learning during Human Decision Making. <i>Nature Human Behaviour</i> .	2020
	Y Cheng, J Bu, N Li, <a href="#">JA Li</a> , H Gou, S Sun, C Liu, Z Jin, C He, C Fan, C Liu, X Zhang. Dysfunctional resting-state EEG microstate correlated with the severity of cigarette exposure in nicotine addiction. <i>Science China Information Sciences</i> .	2020

S Minni\*, L Ji-An\*, T Moskovitz, G Lindsay, K Miller, M Dipoppa, GR Yang. Understanding the Functional and Structural Differences across Excitatory and Inhibitory Neurons. *bioRxiv*, 680439. 2019

R Zha, J Bu, Z Wei, L Han, P Zhang, J Ren, JA Li, Y Wang, L Yang, S Vollstädt-Klein, X Zhang. Transforming brain signals related to value evaluation and self-control into behavioral choices. *Human brain mapping*. 2019

\* = equal contributions

#### Conference papers

J Zida\*, L Ji-An\*, MG Mattar. Understanding atypical decision making behavior with recurrent neural networks. **Contributed Talk**. *Cosyne 2024*

HD Xiong\*, L Ji-An\*, MG Mattar, RC Wilson. Distilling decision-making dynamics with low-dimensional architectures. Poster. *Cosyne 2024*

L Ji-An, MK Benna. Biologically plausible credit assignment without weight symmetry. Poster. *Cosyne 2024*

HD Xiong\*, L Ji-An\*, MG Mattar, RC Wilson. Distilling human decision-making dynamics: a comparative analysis of low-dimensional architectures. Poster. *NeurIPS Workshop AI4Science 2023*

HD Xiong\*, L Ji-An\*, MG Mattar, R Wilson. Neural network modeling reveals diverse human exploration behaviors via state space analysis. **Contributed talk**. *Cognitive Computational Neuroscience 2023*

L Ji-An, MG Mattar. What do meta-reinforcement learning networks learn in two-stage decision-making? Poster. *Cosyne 2022*

GR Yang, J Pastor-Ciurana, M Fradera, RY Zhang, J Forest, J Pozo, J Barbosa, L Ji-An, CJ Cueva, A Compte, J Rocha, M Molano-Mazon. Neurogym: An open resource to developing and sharing neuroscience tasks. Poster. *Cosyne 2021*

S Minni\*, L Ji-An\*, T Moskovitz, G Lindsay, K Miller, M Dipoppa, GR Yang. Understanding the functional and structural differences across excitatory and inhibitory neurons. Poster. *Cosyne 2020*

JA Li, F Stefanini, MK Benna, S Fusi. A Face Familiarity Detection System with Complex Synapses. Poster. *Cosyne 2019*

JA Li, Z Wei, X Zhang. Behavioral and neural evidence for quantum reinforcement learning during decision making. Poster. *Society for Neuroscience 2018*

JA Li, GR Yang, XJ Wang. Neural Mechanisms of Recurrent Neural Networks with Interneurons and Dendrites Performing Context-dependent Decision Making. Poster. *Society for Neuroscience 2018*

\* = equal contributions

#### Research experience

Graduate student researcher. Department of Neurosciences, UC San Diego  
 Advisor: Marcelo Mattar, Marcus Benna 2020 – Present

Undergraduate & graduate student researcher. School of Life Sciences, USTC  
 Advisor: Xiaochu Zhang 2015 – 2020

Student intern. Zuckerman Institute, Columbia University  
 Advisor: Stefano Fusi 2018 – 2020

Student intern. Center for Neural Science, New York University  
 Advisor: Xiao-Jing Wang 2017

#### Talks

Contributed talk, Cosyne 2024

AI for Brain Science, Tianqiao and Chrissy Chen Institute 2023

Neurodinner, Neurosciences Graduate Program, UCSD 2023

KIBM Symposium on Innovative Research, UCSD 2023

Computational Psychiatry Seminar, Chinese Computational Psychiatry Network 2021

Brain Science Institute, RIKEN, Japan 2018

#### Research Mentorship

Ruicheng Li, master student at UCSD, in the group of Marcelo Mattar 2022

	Huixing Gou, graduate student at USTC, in the group of Xiaochu Zhang	2020
Reviewer	eLife, Science Advances, CCN (Conference on Cognitive Computational Neuroscience)	
Teaching	Instructor, Department of Neurosciences, UCSD	2023
	NEU200C Cognitive Neuroscience	
	Teaching assistant, Department of Statistics and Finance, USTC	2018
	Regression Analysis, <i>Excellent Teaching Assistant Honor</i>	
Academic Activities	Co-organizer, Neurotheory Journal Club	2024
	Volunteer, Neuromatch Academy	2023
	Volunteer, Neuromatch Academy	2022
	Student, Computational & Cognitive Neuroscience Summer School, Cold Spring Harbor Asia	2021
	Interactive-track student, Neuromatch Academy	2020
	Translator, <i>A Concise Handbook of TensorFlow</i> , supported by Google Developer Relations Team	2018
	Student, Japanese and Asian Youth Science Exchange Project	2015
	Intern student, Institute of Biophysics (Beijing), CAS	2013
Leadership	President, Computational Neuroscience Committee, UCSD	2023 – Present
	Vice President, Nature Protection Association, USTC	2015 – 2016
Programming	Python (TensorFlow, PyTorch), MATLAB, R, C++, Bash, SQL, AFNI	