JIALIN LI

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EDUCATION

Department of Psychology, New York University (NYU) **New York, USA**
M.A. in Psychology (Concentration in Cognition/Perception &Neuroscience) | GPA: 3.89/4.0 *Sep 2024 – Present*

School of Psychological and Cognitive Sciences, Peking University (PKU) **Beijing, China**
B.S. in Psychology (with Distinguished Graduation thesis Honor) | GPA: 3.52/4.0 *Sep 2020 - July 2024*

RESEARCH EXPERIENCE

Research Interest: Build computational model to uncover the cognitive and neural mechanism that support human adaptive behavior and mental representation of the structure of the world.
Keywords: Reinforcement learning, Efficient coding, NeuroAI, Brain-inspired computation and representation

Human Reaction Time Reflect Planning Strategies in Decision Tree **New York, USA**
Research Assistant | Advisor: Prof. Marcelo Mattar, Department of Psychology, NYU *Sep 2024- Present*

- Analyzed human behavior in decision tree task and developed a probability density approximation method to estimate the joint likelihood of reaction time and choice data in multi-stage decision making.
- Implemented over 14 evidence accumulation model in decision tree and compared the model performance under different tree configurations with different depth and breadth.
- Derived the optimal policy for evidence accumulation and decision strategy on decision tree task.

RNNs Uncover Distinct Stopping Mechanisms in Sequential Decision-making **New York, USA**
Research Assistant | Advisor: Prof. Paul Glimcher, NYU Grossman School of Medicine *January 2025- Present*

- Trained recurrent neural networks using A2C reinforcement learning algorithms on sequential sampling decision making task with heterogeneous evidence streams under different environment constraints.
- Conducted normative analysis using dynamic programming to explain the time-vary decision threshold.
- Revealed Time-coding trajectory in hidden states when imposing time constraints in the neural network.

The Description-Experience Gap in Exploration-Exploitation tradeoff **Beijing, China**
Research Assistant | Advisor: Prof. Jian Li, Department of Psychology, PKU *November 2023- Present*

- Investigated the value representation in sequential decision making by designing a minimalistic exploration-exploitation paradigm and collected data from over 180 participants using online study.
- Built computational model to show that human adaptively adjust their exploration-exploitation behavior by evaluating the current sample with the preceding samples on both within-trial and across-trial level.

SELECTED RELATED COURSE PROJECT

Efficient Coding for Future Reward in Multidimensional Probabilistic Map **New York, USA**
Research Methods & Experience| Instructor: Prof. David Bosch *January. 2025 - May 2025*

- Proposed a novel multidimensional efficient coding model to account for how dopamine neurons encode a joint distribution over future reward magnitudes and delays.

Limited Categorization Adaptive Discount in Overharvesting Behavior **Beijing, China**
Introduction to Cognitive Modeling | Instructor: Prof. Hang Zhang *Mar. 2023 - June 2023*

- Built computational model that incorporate limitation memory and probability distortion on patch foraging task to investigate human structural learning and adaptive planning behavior.

Planning with Linear Reinforcement learning and Successor Representation **Beijing, China**
Artificial Intelligence for Psychology | Instructor: Prof. Si Wu *Mar. 2024 - June 2024*

- Compared the difference between linear reinforcement learning and successor representation algorithm on representation matrix, value function estimation by running model simulation on different environment.

RELATED RESEARCH EXPERIENCE

Neural Mechanism of Sound-Induced Flash Illusion **Los Angeles, USA**
Independent Researcher | Advisor: Prof. Ladan Shams, Department of Psychology, UCLA *July 2023- Dec 2023*

- Conducted ERP analysis and time-frequency analysis, which discovered ERP components such as P100, P200 and oscillatory activity of the alpha-band and theta-band and related to SIFI.
- Built CNNs and trained the classifier to decode the environmental stimuli based on EEG signals.

Selective Attention Mechanism in Auditory Working Memory **Beijing, China**
Researcher | Advisor: Prof. Huan Luo, McGovern Institute for Brain Research, PKU *Sep. 2022 - Dec. 2023*

- Conducted eye-tracking experiment to investigate how people allocate their attention in multiple auditory streams with diverse acoustic features.
- Revealed via behavioral analysis and built drift-diffusion model that the auditory stream with greater attention resources led to improved auditory working memory performance.

PUBLICATIONS

Li, J. Louie, K. Glimcher, P. Shen, B. (2025). RNNs reveal a new optimal stopping rule in sequential sampling for decision-making. *CogInterp Workshop, NeurIPS 2025*.

RESEARCH SKILLS

- **Code:** Python, R, MATLAB, LATEX, Julia, JavaScript/CSS/HTML, Bash, Slurm, Vim
- **Data Collection:** Behavior (Psychotoolbox/PsychoPy/jsPsych), Eye-tracking (EyeLink), EEG(BrainVision)
- **Computational:** Hierarchy Bayesian Inference, Artificial Neural Networks, Neuron Dynamics
- **Mathematics:** Linear Algebra, Optimization, Information Theory, Reinforcement Learning, Graph Theory

TEACHING EXPERIENCE

Psychological Statistics **Beijing, China**
Teaching Assistant | Instructor: Prof. Jian Li, School of Psychological and Cognitive Sciences, PKU *Sep. 2023 - Dec 2023*

- Lead weekly recitations and practice about statistical inference with R, proctor exams, grade assignments, and hold office hours (Course materials could be found in this link).

Computer Programming for Psychological Sciences **New York, USA**
Course Assistant | Instructor: Prof. Kelsey Moty, Department of Psychology, NYU *Jan. 2025 - May 2025*

- Instruct students how to code, plot and conduct statistical analysis in R, grade assignments and projects, and hold office hours (Course materials could be found in this link).

INTERNSHIP

Twirling **Beijing, China**
Internship *Jan. 2024 – May 2024*

- Participated in building a large-scale language model (LLM) for psychological counseling through the langchain-chatchat, using Retrieval-Augmented Generation (RAG) to achieve knowledge base LLMs.
- Drafted a research plan for multimodal recognition of psychological disorders, providing insights by integrating machine learning methods and psychological knowledge.

SCHOLARSHIPS

- Undergraduate Study Scholarship in School of Psychological and Cognitive Sciences, PKU *2022-2024*
- QunZheng Research Funding, PKU(碁政研究基金) *April 2023*