Jialin Li

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Objective

I'm interested in the cognitive and neural principle of the brain that support human adaptive decision-making and learning. I build computational models to study how the brain constructs its mental representation of the structure of the world that supports such intelligent behavior.

Education

- **New York University (NYU)** *Sep 2024 - Present*
  M.A. in Psychology (Concentration in Cognition/Perception & Neuroscience) New York, USA
  ◦ GPA: 3.89/4.0
- **Peking University (PKU)** *Sep 2020 - July 2024*
  B.S. in Psychology (with Distinguished Graduation Thesis Honor) Beijing, China
  ◦ GPA: 3.52/4.0

Research Experience

- **Joint Modeling of Choices and Response Times in Multi-stage Decision** *July 2025 - Present*
  Research Assistant | Mattar lab, NYU Psychology New York, USA
  ◦ Developed a probability density approximation (PDA) framework in multi-stage decision tasks
  ◦ Conducted new human experiment in decision tree navigation task to collect choices and reaction times data
  ◦ Fitted evidence accumulation models to demonstrate the importance of modeling full reaction time distribution
- **RNNs Uncover Distinct Stopping Mechanisms in Sequential Decision-making** *Jan 2025 - Present*
  Research Assistant | Glimcher lab, NYU Grossman School of Medicine New York, USA
  ◦ Trained recurrent neural networks using A2C algorithms on sequential decision making task.
  ◦ Conducted normative analysis via dynamic programming to explain the time-varying decision threshold.
  ◦ Fitted TinyRNN to monkey data and revealed time-coding trajectory in hidden states.
- **The Description-Experience Gap in Exploration-Exploitation tradeoff** *Nov 2023 - July 2024*
  Research Assistant | Li lab, PKU Psychology Beijing, China
  ◦ Designed a exploration-exploitation paradigm and collected data from over 180 participants using online study.
  ◦ Built cognitive model to explain why human adaptively adjust their exploration-exploitation behavior by evaluating the current sample with the preceding samples on both within-trial and across-trial level.

Patents & Publications

C=Conference, S=In Submission

[C.1] 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.

[S.1] Li, J., Correa, C. G., Mattar, M. G. (2026). **Joint Modeling of Choices and Response Times in Multi-stage Decision via Likelihood Approximation.** Proceedings of the Annual Meeting of the Cognitive Science Society (Submitted).

Course Project

- **Simplicity Bias in Low-Rank RNNs for Multitask and Continual Learning** *Sep. 2025 - Dec 2025*
  Computational Neuroscience | Prof. Cristina Savin New York, USA
  ◦ Trained low-rank RNNs in multi-task and continual learning setting and investigated how simplicity bias emerged from their neural geometry using dynamical similarity analysis.
- **Efficient Coding for Future Reward in Multidimensional Probabilistic Map** *Jan. 2025 - May 2025*
  Research Methods & Experience | Prof. David Bosch New York, USA
  ◦ Proposed a novel multidimensional efficient coding model to account for how dopamine neurons encode a joint distribution over future reward magnitudes and delays.
- **Planning with Linear Reinforcement learning and Successor Representation** *Mar. 2024 - June 2024*
  Artificial Intelligence for Psychology | Prof. Si Wu Beijing, China
  ◦ Compared the difference between linear reinforcement learning and successor representation algorithm on representation matrix, value function estimation by running model simulation on different environment.
- **Limited Categorization Adaptive Discount in Overharvesting Behavior** *Mar. 2023 - June 2023*
  Introduction to Cognitive Modeling | Prof. Jian Li Beijing, China
  ◦ Built computational model that incorporate limitation memory and probability distortion on patch foraging task to investigate human structural learning and adaptive planning behavior.

Internship

- **Twirling** *Jan. 2024 - May 2024*
  Software Engineer Beijing, China
  - Built a large-scale language model (LLM) for psychological counseling through the langchain-chatchat
  - Utilized Retrieval-Augmented Generation (RAG) to achieve knowledge base LLMs
  - Drafted a research plan for multimodal recognition of psychological disorders

Skills

- **Programming Languages:** Python, R, MATLAB, LATEX, Julia, Bash
- **Web Technologies:** JavaScript, CSS, HTML
- **Data Science & Machine Learning:** PyTorch, Gym, TensorFlow, pymc, BrainPy
- **DevOps & Version Control:** Slurm, Vim, Git
- **Specialized Area:** Reinforcement learning, Information theory, Graph theory, Bayesian inference, Dynamic system
- **Mathematical & Statistical Tools:** Linear Algebra, Calculus, Probability Theory, Convex Optimization
- **Experimental Techniques:** Psychotoolbox, PsychoPy, jsPsych, EyeLink, BrainVision

Honors & Awards

- **Undergraduate Study Scholarship** *2022 - 2024*
  School of Psychological and Cognitive Sciences, PKU
- **QunZheng Research Funding (**筘政研究基金**)** *April 2023*
  Peking University
- **Psychology Department's Master-Mentorship Model Award** *Nov 2025*
  New York University

References

1. **Marcelo Mattar**
   Assistant Professor
   Department of Psychology, NYU
   Email: marcelo.mattar@nyu.edu
   Phone: +1 267-340-7645
   Relationship: Master's Advisor
2. **Paul Glimcher**
   Julius Silver Professor
   NYU Grossman School of Medicine
   Email: paulg@nyu.edu
   Phone: +1 646-541-4397
   Relationship: Master's Advisor
3. **Jian Li**
   Associate Professor
   School of Psychological and Cognitive Sciences, PKU
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   Phone: +86 188-1106-8398
   Relationship: Undergraduate Thesis Advisor