Jordan Lei

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Experience

New York University **Aug 2021 – Present**
PhD Candidate / Researcher - Ma Lab *New York, NY*

- Research focus: using **reinforcement learning** and **deep learning** models to model complex planning
- *How do monkeys plan?* Trained a deep learning model to predict how a monkey planned its moves on a board game. Predicted eye movements and analyzed correlates of neural activity. We found that monkeys use myopic feature-based reasoning in complex planning games.
    - **Lei J.,** Park M.-Y., Oemisch M., van Opheusden B., Osborne K., Liang H., Ferguson M., Lee D., Ma W.J., Choice and Deliberation in a Complex Planning Game in Monkeys, Invited Talk presented at RLDM 2025.
    - **Lei J.,** Park M.-Y., Oemisch M., van Opheusden B., Osborne K., Liang H., Ferguson M., Lee D., Ma W.J., Choice and Deliberation in a Complex Planning Game in Monkeys, Poster presented at COSYNE 2024.
    - Park M.-Y., **Lei J.,** Oemisch M., Liang H., van Opheusden B., Ma W.J., Lee D., Multiplexing of Value Signals in the Primate Frontostriatal Network during a Strategy Board Game, Poster presented at SfN 2024
- *How does uncertainty affect planning effort?* Built and deployed a full-stack JavaScript website to collect data and run online experiments. We found that people diminish their planning depth as uncertainty increases, using three novel experimental designs.
    - (In Revision) Lei, J., Olieslagers, J., Arfaei, N., Lin, D. X., Ma, W. J. (2025). Human Planning in Stochastic Environments. *psyArXiv*. 2025-05. Pending Revision at Nature Communications, 2025.
    - **Lei, J.,** & Ma, W. J. (2024). Uncertainty affects planning effort, but not plans. In *Proceedings of the Annual Meeting of the Cognitive Science Society* (Vol. 46).
    - **Lei, J.,** & Ma, W. J. Uncertainty affects planning effort, but not plans, Poster presented at CogSci 2024
- Awards: 2023 Training Program in Computational Neuroscience Grant, 2021 Henry M. MacCracken Fellowship

Point72 Asset Management **Summer 2025**
Quantitative Research Intern *New York, NY*

- Combined cognitive modeling and financial analysis to support portfolio optimization and investment decision research. Applied statistical modeling techniques—including time-varying regression and mixed-effects models—to analyze decision-making in discretionary investing and develop quantitative signals aimed at alpha generation.

University of Pennsylvania **May 2020 – May 2021**
Researcher - Kording Lab *Philadelphia, PA*

- Created a deep learning model of visual attention. Incorporated convolutions, recurrence, encoder-decoder architectures, and custom loss functions to build a model that replicates key features of biological attention.
    - Salehinajafabadi, S., **Lei, J.,** Benjamin, A. S., Muller, K. R., & Kording, K. P. (2024). Modeling Attention and Binding in the Brain through Bidirectional Recurrent Gating. *bioRxiv*, 2024-09. Submitted to Nature Neuroscience, 2024.

Education

New York University | GPA: 3.9/4.0 **(Expected) May 2026**
PhD Candidate, Neuroscience; Thesis: "Neural and Cognitive Mechanisms of Complex Planning", Advisor: Wei Ji Ma

University of Pennsylvania | GPA: 4.0/4.0, Summa Cum Laude **May 2021**
MSE, Computer Science; Thesis: "Object-Based Attention Through Internal Gating", Advisor: Konrad Kording

University of Pennsylvania | GPA: 3.9/4.0, Summa Cum Laude **May 2020**
BS in Engineering, Computer Science, School of Engineering and Applied Sciences
BS in Economics, Operations/Information/Decisions, The Wharton School
Jerome Fisher Program in Management and Technology (M&T), National Merit Scholar

Skills & Interests

- **Skills:** Deep Learning, Reinforcement Learning, Computer Vision (CNNs, Autoencoders), Natural Language Processing (RNNs, Transformers), Generative Models (GANs), Neuroscience, Cognitive Science
- **Computer Languages:** Python (PyTorch, TensorFlow, Keras), MATLAB, Java, C/C++, JavaScript (React)
- **Interests:** Life drawing at museums, community organizing (co-President of student council, lead web designer for *Growing Up in Science*), podcasts (favorites: *Dear Hank & John, SciShow Tangents*), competitive swimming