

Alexander Fung

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Pre-doctoral researcher interested in mathematical principles of computation in neural circuits.

EDUCATION

B.S. in Electrical Engineering & Computer Science	University of California, Berkeley
B.A. in Molecular & Cellular Biology	2019 – 2023
GPA: 3.99	

POSITIONS

Research Assistant	The University of Chicago
<i>Nogueira Manas Lab Grossman Center for Quantitative Biology and Human Behavior</i>	2025 – present
• Bridging machine learning and geometric approaches for neural data analysis.	

Research Assistant	Massachusetts Institute of Technology
<i>Fedorenko Lab McGovern Institute for Brain Research</i>	2023 – 2025
• Language model architectures for efficient syntax learning.	
• Computational and neuroimaging approaches investigating the neural basis of language and reasoning.	

Undergraduate Researcher	University of California, Berkeley
<i>Song Lab Departments of EECS and Statistics</i>	2021 – 2023
• Statistical properties of protein geometry and microsecond dynamics.	
• Unsupervised protein structure prediction.	

Undergraduate Researcher	Lawrence Berkeley National Laboratory
<i>Bouchard Lab</i>	2022 – 2023
• Learning frequency tuning properties in rat auditory cortex.	

Research Intern	NASA Glenn Research Center
<i>Space Communications and Navigation Program</i>	2021
• Learning signal reliability metrics for delay-tolerant networks.	

HONORS & AWARDS

School of Science QoL Grant	Massachusetts Institute of Technology	2024
SPOT Award	McGovern Institute for Brain Research	2024
NSF Graduate Research Fellowship*	National Science Foundation	2023
Leslie Lipson Essay Prize	University of California, Berkeley	2021
HealthHack \$10,000 Grand Prize	Sacramento School of AI	2019

*Declined.

PUBLICATIONS

Preprints

1. Kean, H., **Fung, A.***, Jagers, P.*, Benn, Y., Tenenbaum, J., Piantadosi, S., Varley, R., Fedorenko, E. (2024). The Language of Thought is not Language: Evidence from Formal Logical Reasoning. Under Review.
2. **Fung, A.***, Koehl, A.*, Jagota, M., Song, Y. (2022). The Impact of Protein Dynamics on Residue-Residue Co-evolution and Contact Prediction. Preprint.

Papers

3. Ryskina, M., Tuckute, G., **Fung, A.**, Malkin, A., Fedorenko, E. (2025). The Role of Language and Concepts in LM–Brain Alignment. *Second Conference on Language Modeling*.
4. Kean, H., **Fung, A.**, Pramod, R.T., Chomik-Morales, J., Kanwisher, N., Fedorenko, E. (2025). Intuitive Physical Reasoning Is Not Mediated by Linguistic nor Exclusively Domain-General Abstract Representations. *Neuropsychologia*.
5. Dudukovich, R., Gormley, D., Kancharla, S., Wagner, K., Short, R., Brooks, D., Fantl, J., Janardhanan, S., **Fung, A.** (2022). Towards the Development of a Multi-Agent Cognitive Networking System for the Lunar Environment. *IEEE Journal of Radio Frequency Identification*.
6. Koehl, A.*, Jagota, M.*, Erdmann-Pham, D.*, **Fung, A.**, Song, Y. (2021). Transferability of Geometric Patterns from Protein Self-Interactions to Protein-Ligand Interactions. *Pacific Symposium on Biocomputing*.

*Equal contribution.

INVITED TALKS

Mechanistic Models of Biophysical Processes
Special Seminar | Grossman Center for Quantitative Biology and Human Behavior

The University of Chicago
2025

POSTERS

1. **Fung, A.***, Zhuang, C.*, Piantadosi, S., Andreas, J., Fedorenko, E. (2024). Word-Order Error Detection Helps Data-Efficient Language Models Learn Syntax [Poster Presentation]. *Cognitive Computational Neuroscience 2024*.
2. Kean, H., **Fung, A.**, Rule, J., Tenenbaum, J., Piantadosi, S., Fedorenko, E. (2024). Deductive and Inductive Processing Dissociate in the Human Brain [Poster Presentation]. *Cognitive Computational Neuroscience 2024*.