

# Alexander Fung

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

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## EDUCATION

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

## POSITIONS

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Research Assistant	Massachusetts Institute of Technology
<i>Fedorenko Lab   McGovern Institute for Brain Research</i>	2023 – present
<ul style="list-style-type: none"><li>• Language model architectures for efficient syntax learning.</li><li>• Computational and neuroimaging approaches investigating the neural basis of language and reasoning.</li></ul>	

Undergraduate Researcher	University of California, Berkeley
<i>Song Lab   Departments of EECS and Statistics</i>	2021 – 2023
<ul style="list-style-type: none"><li>• Statistical properties of protein geometry and microsecond dynamics.</li><li>• Unsupervised protein structure prediction.</li></ul>	

Undergraduate Researcher	Lawrence Berkeley National Laboratory
<i>Bouchard Lab</i>	2022 – 2023
<ul style="list-style-type: none"><li>• Learning frequency tuning properties in rat auditory cortex.</li></ul>	

Research Intern	NASA Glenn Research Center
<i>Space Communications and Navigation Program</i>	2021
<ul style="list-style-type: none"><li>• Learning signal reliability metrics for delay-tolerant networks.</li></ul>	

## HONORS & AWARDS

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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

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### Preprints

1. Ryskina, M., Tuckute, G., **Fung, A.**, Malkin, A., Fedorenko, E. (2025). The Role of Language and Concepts in LM–Brain Alignment. Under Review.
2. 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.
3. **Fung, A.\***, Koehl, A.\*, Jagota, M., Song, Y. (2022). The Impact of Protein Dynamics on Residue-Residue Co-evolution and Contact Prediction. Preprint.

### Papers

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

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

The University of Chicago  
2025

## POSTERS

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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*.