

# Qihong Lu

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## Education

- 2017-2023 **Ph.D., Cognitive Psychology**, Princeton University.  
Advisors: Ken Norman, Uri Hasson
- 2019 **M.A., Cognitive Psychology**, Princeton University.
- 2013-2017 **B.S., Mathematics & Psychology**, University of Wisconsin-Madison.  
Graduated with Comprehensive Honors; Certificate in Computer Science

## Research Experience

- 2017-present **Princeton Computational Memory Lab**, Princeton University.  
P.I.: Kenneth A. Norman
- 2017-present **Hasson Lab**, Princeton University.  
P.I.: Uri Hasson
- 2014-2017 **Knowledge and Concepts Lab**, UW-Madison.  
P.I.: Timothy T. Rogers
- Summer 2015 **The Parallel Distributed Processing Lab**, Stanford University.  
& 2016 P.I.: James L. McClelland
- 2013-2015 **Language and Cognitive Neuroscience Lab**, UW-Madison.  
P.I.: Maryellen C. MacDonald & Mark S. Seidenberg

## Papers & Preprints

- Lu, Q., Hasson, U., Norman, K.A., (2022). A neural network model of when to retrieve and encode episodic memories. *eLife*, 11, e74445.
- Rogers, T. T., Cox, C., Lu, Q., Shimotake, A., Kikuch, T., Kunieda, T., Miyamoto, S., Takahashi, R., Ikeda, A., Matsumoto, R., Lambon Ralph, M. A. (2021). Evidence for a deep, distributed and dynamic semantic code in human ventral anterior temporal cortex. *eLife*, 10, e66276.
- Chen, C., Lu, Q., Beukers, A., Baldassano, C., & Norman, K. A. (2021). Learning to perform role-filler binding with schematic knowledge. *PeerJ*, 9, e11046.
- Kumar, M., Anderson, M.J., Antony, J.W., Baldassano C., Brooks, P.P., Cai, M.B., Chen, P.H.C., Ellis, C.T., Henselman-Petrusek, G., Huberdeau, D., Hutchinson, J.B., Li, P.Y., Lu, Q., Manning, J.R., Mennen, A.C., Nastase, S.A., Hugo, R., Schapiro, A.C., Schuck, N.W., Shvartsman, M., Sundaram, N., Suo, D., Turek, J.S., Vo, V.A., Wallace, G., Wang, Y., Zhang, H., Zhu, X., Capota, M., Cohen, J.D., Hasson, U., Li, K., Ramadge, P.J., Turk-Browne, N.B., Willke, T.L. & Norman, K.A. (2021). BrainIAK: The Brain Imaging Analysis Kit. *Aperture Neuro*, 1(4).
- Lu, Q., Hasson, U., Norman, K.A., (2020). Learning to use episodic memory for event prediction. *bioRxiv*.
- Kumar, M., Ellis, C. T., Lu, Q., Zhang, H., Capotă, M., Willke, T. L., Ramadge, P. J., Turk-Browne, N. B., & Norman, K. A. (2020). BrainIAK tutorials: User-friendly learning materials for advanced fMRI analysis. *PLoS Computational Biology*, 16(1), e1007549.
- Lu, Q., Chen, P. H., Pillow, J. W., Ramadge, P. J., Norman, K. A., & Hasson, U. (2018). Shared Representational Geometry Across Neural Networks. Workshop on Integration of Deep Learning Theories, 32<sup>nd</sup> Conference on Neural Information Processing Systems Montréal, Canada.

McClelland, J. L., Mickey, K., Hansen, S., Yuan, X., & Lu, Q. (2016). A Parallel-Distributed Processing Approach to Mathematical Cognition. Manuscript, Stanford University.

## ■ Invited Talks & Conference Presentation

- 2022 Mila Neural-AI Reading Group, Mila - Quebec AI Institute
- 2021 Dynamic Memory Lab. University of California, Davis. PI: Charan Ranganath
- 2021 Contextual Dynamics Lab. Dartmouth College. PI: Jeremy Manning
- 2021 Honey lab & Chen lab. Johns Hopkins University. PI: Janice Chen & Chris Honey
- 2021 DeepMind Technologies. PI: Matt Botvinick
- 2021 Oxford Neurotheory Lab, University of Oxford. PI: Andrew Saxe
- 2021 Invited Symposium on How Prior Knowledge Shapes Encoding of New Memories, Cognitive Neuroscience Society Annual Meeting (CNS)
- 2020 Context and Episodic Memory Symposium (CEMS)
- 2020 Neuromatch Conference

## ■ Conference Posters

- Lu, Q., Fan, Z. Y., Hasson, U., & Norman, K. A. (2019) Optimal Timing for Episodic Retrieval and Encoding for Event Understanding. The Conference on Cognitive Computational Neuroscience.
- Lu, Q., Fan, Z. Y., Hasson, U., & Norman, K. A. (2019) Patience is a virtue: A normative account of why waiting to encode and retrieve memories benefits event understanding. Poster presented at the Context and Episodic Memory Symposium.
- Kumar, M., Ellis, C.T., Lu, Q., Zhang, H., Capotă, M., Willke, T.L., Ramadge, P.J., Turk-Browne, N.B., & Norman, K.A. (2019). BrainIAK tutorials: user-friendly learning materials for advanced fMRI analysis. Poster presented at The Organization for Human Brain Mapping Annual Meeting.
- Lu, Q., Chen, P. H., Pillow, J. W., Ramadge, P. J., Norman, K. A., & Hasson, U. (2018). Shared Representational Geometry Across Neural Networks. Poster presented at the workshop on Integration of Deep Learning Theories, 32<sup>nd</sup> Conference on Neural Information Processing Systems.
- Kumar, M., Ellis, C. T., Lu, Q., Zhang, H., Ramadge P. J., Norman, K. A., & Turk-Browne N. B. (2018). BrainIAK education: user-friendly tutorials for advanced, computationally-intensive fMRI analysis. Poster presented at the 48<sup>th</sup> Annual Meeting of the Society for Neuroscience.
- Lu, Q., Hasson, U., & Norman, K. A. (2018). Modeling hippocampal-cortical dynamics during event processing. The Conference on Cognitive Computational Neuroscience.
- Yu, J. Lu, Q., Hasson, U., Norman, K. A., & Pillow, J. W. (2018). Performance optimization is insufficient for building accurate models for neural representation. The Conference on Cognitive Computational Neuroscience.
- Chen, C., Lu, Q., Beukers, A. Baldassano, C., & Norman, K.A. (2018). Generalized schema learning by neural networks. The Conference on Cognitive Computational Neuroscience.
- Lu, Q., Ramadge, P., Norman, K. A. & Hasson, U. (2018). Measuring representational similarity across neural networks. Poster to be presented at the 40<sup>th</sup> Annual Meeting of the Cognitive Science Society.
- Lu, Q., & Rogers, T. T. (2016). An interactive model accounts for both ultra-rapid superordinate classification and basic-level advantage in object recognition. Poster presented at the 38<sup>th</sup> Annual Meeting of the Cognitive Science Society.
- Lu, Q., & McClelland, J. L. (2016). Teaching a neural network to count: reinforcement learning with “social scaffolding”. Poster presented at the 15<sup>th</sup> Neural Computation and Psychology Workshop.
- Cox, C. R., Lu, Q., & Rogers, T. T. (2015). Iterative Lasso: An even-handed approach to whole brain multivariate pattern analysis. Poster presented at the 22<sup>nd</sup> Cognitive Neuroscience Society annual

conference.

## Teaching

- Jul-Aug 2021 **TA**, Deep Learning.  
Neuromatch Academy
- Spring 2021, **TA**, ELE|NEU|PSY 480 fMRI Decoding: Reading Minds Using Brain Scans.  
Fall 2018 Prof: Ken Norman & Peter Ramadge; Princeton
- Spring 2020, **TA**, NEU 350 Laboratory in Principles of Neuroscience (2-week fMRI lab).  
Spring 2018 Prof: Alan Gelperin & Anthony Ambrosini; Princeton
- Spring 2019 **TA**, NEU|PSY 330 Computational Modeling of Psychological Function.  
Prof: Jon Cohen; Princeton
- Nov 2019, **Guest lecture**, Functional Alignment for fMRI data.  
Jan 2019 BrainIAK workshop at Princeton
- Aug 2018 **Guest lecture**, Intro to Multivariate Pattern Analysis.  
BrainIAK workshop at Princeton

## Research Mentoring

- 2020-2021 Carson Wardell, Senior Thesis, Princeton. Learning to imagine: Using Memory-Augmented Neural Networks to Model Cortical-Hippocampal Interaction During Mental Simulation.
- 2018-2019 Kathy Fan, Senior Thesis, Princeton. Learning When to Encode and Retrieve Episodic Memories with Memory-Augmented Neural Networks.
- Summer 2018 Noam Miller, Summer research, Princeton. Leabra7: A Python Software for Modeling Hippocampal-Cortical Interactions in Learning.
- 2017-2018 Catherine Chen, Senior Thesis, Princeton. Learning the Schematic Structure of a World: Contextual Understanding of Stochastically Generated Stories in Neural Networks.

## Review

- Journal Neurobiology of Learning and Memory, ReScience
- Conference Conference on Cognitive Computational Neuroscience, Conference on the Mathematical Theory of Deep Neural Networks

## Service

- 2018-present **Organizer**, The Parallel Distributed Processing (PDP) meeting, Princeton.
- 2018-present **Contributor/Code review**, Brain Imaging Analysis Kit, PNI-Intel collaboration.
- 2020-2021 **Member**, Psychology Graduate Student Committee.
- 2020 **Co-organizer**, Conference on the Mathematical Theory of Deep Neural Networks.
- 2014-2017 **Student representative**, Faculty Honors Committee, UW-Madison.
- 2013-2014 **Tutor for Calculus**, Greater University Tutoring Service, UW-Madison.

## Technical Skills

Python (pytorch, keras), Git, SQL (SQLite), bash script, Matlab, R,  $\text{\LaTeX}$ , Adobe Photoshop & Lightroom

## Honors & Awards

- 2021 **Graduate Student Fellowship in Cognitive Science**, Princeton.
- 2021 **Certificate of Excellence**, for teaching a Deep learning course, NeuromatchAcademy.
- 2018 **Charles W. Lummis Scholarship**, Princeton.
- 2017 **College of Letters & Science Dean's Prize**, UW-Madison.
- 2017 **Undergraduate Academic Achievement Award**, UW-Madison.
- 2017 **Outstanding Undergraduate Research Scholar Award**, UW-Madison.
- 2016 **David H. Durra Scholarship**, UW-Madison.
- 2016 **Undergraduate Travel Awards**, UW-Madison.
- 2015 **Phi Beta Kappa as a junior**, UW-Madison.
- 2015 **Hilldale Undergraduate Research Fellowship**, UW-Madison.
- 2015 **Bromley Research Conference Travel Grant**, UW-Madison.
- 2015 **CSLI Summer Research Internship**, Stanford.
- 2014, 2015 **Undergraduate Research Scholar Award**, UW-Madison.
- 2014 **International Undergraduate Writing Contest 3<sup>rd</sup> Place**, UW-Madison.
- 2014 **Margaret E. and Allard Smith Scholarship**, UW-Madison.
- 2014 **Welton Summer Sophomore Research Grant**, UW-Madison.