

Qihong Lu

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.
- 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. (2022). BrainIAK: The Brain Imaging Analysis Kit. *Aperture Neuro*, 1(4).
- 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.
- 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, 32nd 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 Penn Computational Cognitive Neuroscience Lab. University of Pennsylvania. PI: Anna Schapiro
- 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, 32nd 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 48th 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 40th 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 38th 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 15th 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 22nd 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 International Conference for Learning Representations (ICLR), Conference on Cognitive Computational Neuroscience (CCN), Conference on the Mathematical Theory of Deep Neural Networks (DeepMath)

Service

- 2018-present **Contributor/Code review**, Brain Imaging Analysis Kit, PNI-Intel collaboration.
- 2018-2021 **Organizer**, The Parallel Distributed Processing (PDP) meeting, Princeton.
- 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, L^AT_EX, 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 3rd Place**, UW-Madison.
- 2014 **Margaret E. and Allard Smith Scholarship**, UW-Madison.
- 2014 **Welton Summer Sophomore Research Grant**, UW-Madison.