

Qihong Lu

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Research Interests

- i Using artificial neural networks as model organisms to study computational principles of learning and memory.
- ii Using human behavioral and neuroimaging experiments to test the model predictions.

Academic Positions

- 2026/01- **Presidential Assistant Professor, Department of Neuroscience**
City University of Hong Kong.
- 2023/12- **Alan Kanzer Postdoctoral Fellow, Center for Theoretical Neuroscience and**
2025/12 **The Mortimer B. Zuckerman Mind Brain Behavior Institute**
Columbia University.
Advisors: Daphna Shohamy, Stefano Fusi
- 2023/06-12 **Postdoctoral Researcher, Princeton Neuroscience Institute**
Princeton University.
Advisor: Kenneth A. Norman

Education

- 2017-2023 **Ph.D. & M.A., Cognitive Psychology**
Princeton University.
Advisors: Kenneth A. Norman, Uri Hasson
Dissertation Committee: Thomas L. Griffiths, Samuel J. Gershman, Jeffrey M. Zacks
- 2013-2017 **B.S., Mathematics & Psychology; Certificate in Computer Science**
University of Wisconsin-Madison.
Graduated with Comprehensive Honors (college-level highest honors)
Advisor: Timothy T. Rogers

Research Internships

- 2022/05-09 **Research Scientist Intern, CTRL-labs, Reality Labs, Meta.**
Managers: Abigail Russo, Diogo Peixoto & David Sussillo
- 2015/05-09, **Research Intern, The Parallel Distributed Processing Lab, Stanford University.**
2016/05-09 Advisor: James L. McClelland

Research Grants and Fellowships

- 2026-2029 **Presidential Assistant Professor Scheme Startup Grant**, CityU Hong Kong.
2023-2026 **Alan Kanzer Postdoctoral Fellowship**, Columbia University.

Papers & Preprints (*: undergraduate mentee)

- Lu, Q.**, Fusi, S., Norman, K. A., & Shohamy, D. (under review). Lingering episodic memory modes as adaptations to autocorrelation.
- Song, H., **Lu, Q.**, Nguyen, T., Chen, J., Leong, Y. C., Rosenberg, M. D., Ching, S., Zacks, J. M. (under review). [A neural network model with episodic memory learns causal relationships between narrative events](#). bioRxiv.
- Li, M., Jensen, K. T., Zhang, Q., **Lu, Q.**, & Mattar, M. G. (under review). [A neural network model of free recall learns multiple memory strategies](#). bioRxiv.

Published:

- Dong, V. C., **Lu, Q.**, Norman, K. A. & Michelmann, S. (2025). [Towards large language models with human-like episodic memory](#). Trends in Cognitive Sciences. 0(0).
- Lu, Q.**, Hummos, A., & Norman, K. A. (2024). [Episodic memory supports the acquisition of structured task representations](#). Proceedings of the Annual Meeting of the Cognitive Science Society 46 (46).
- Lu, Q.**, Nguyen, T., Zhang, Q., Hasson, U., Griffiths, T. L., Zacks, J. M., Gershman, S. J., & Norman, K. A. (2024). [Reconciling shared versus context-specific information in a neural network model of latent causes](#). Scientific Reports. 14(1), 1-15.
- 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., Kikuchi, 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., 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 (NeurIPS).
- McClelland, J. L., Mickey, K., Hansen, S., Yuan, X., & **Lu, Q.** (2016). [A Parallel-Distributed Processing approach to mathematical cognition](#). Manuscript, Stanford University.

External Talks

- 2025/11 Memory and Knowledge Representation Symposium, East China Normal University.
- 2025/11 Tianqiao and Chrissy Chen Institute, Shanghai.
- 2025/07 Working Memory Symposium
- 2025/05 Chen Lab & Honey Lab. Johns Hopkins University. PI: Janice Chen & Chris Honey.
- 2025/05 Division of Social Science, Hong Kong University of Science and Technology.
- 2025/04 Department of Psychology, The University of Hong Kong.
- 2025/04 Affective, Neuroscience, and Decision-making Lab, University of Macau. PI: Haiyan Wu

- 2025/04 Department of Psychology, Chinese University of Hong Kong.
- 2025/03 Laboratory of Cognitive Computational Neuroscience and Neuroimaging, Shanghai Jiao Tong University. PI: Ru-Yuan Zhang
- 2025/03 NYUConcats seminar, Psychology Department, New York University
- 2025/02 Department of Neuroscience, City University of Hong Kong
- 2024/12 The School of Psychology and Cognitive Science, East China Normal University
- 2024/12 Kwok Lab, Duke Kunshan University, PI: Sze Chai Kwok
- 2024/10 Nanosymposium on Value-Based Decision Making Across Model Systems, Society for Neuroscience (SfN)
- 2024/07 Annual Meeting of the Cognitive Science Society (Cogsci)
- 2024/06 Manhattan Area Memory Meeting, Yale University
- 2024/05 Context and Episodic Memory Symposium (CEMS), University of Pennsylvania
- 2024/04 Tianqiao and Chrissy Chen Institute, Shanghai.
- 2023/11 Mattar Lab. New York University. PI: Marcelo Mattar
- 2023/10 Department of Psychology, The University of Hong Kong.
- 2023/09 Shohamy Lab. Columbia University. PI: Daphna Shohamy
- 2022/03 Computational Cognitive Neuroscience Lab. University of Pennsylvania. PI: Anna Schapiro
- 2022/02 State Key Laboratory of Cognitive Sciences and Learning. Beijing Normal University. PI: Yunzhe Liu
- 2022/02 Mila Neural-AI Reading Group. Mila - Quebec AI Institute
- 2021/07 Honey Lab & Chen Lab. Johns Hopkins University. PI: Chris Honey & Janice Chen
- 2021/07 Contextual Dynamics Lab. Dartmouth College. PI: Jeremy Manning
- 2021/06 Oxford Neurotheory Lab. University of Oxford. PI: Andrew Saxe
- 2021/03 Google DeepMind. PI: Matthew Botvinick
- 2021/03 [Invited Symposium on How Prior Knowledge Shapes Encoding of New Memories](#). Cognitive Neuroscience Society Annual Meeting (CNS)
- 2021/02 Dynamic Memory Lab. University of California, Davis. PI: Charan Ranganath
- 2020/08 [Context and Episodic Memory Symposium \(CEMS\)](#), University of Pennsylvania
- 2020/03 Neuromatch Conference (NMC)

Conference Proceedings (*: undergraduate mentee)

- Li, M., Jensen, K. T., **Lu, Q.**, & Mattar M. G. (2026). A neural network model of flexible decision making with episodic memory. Computational and Systems Neuroscience.
- Li, M., Jensen, K. T., **Lu, Q.**, & Mattar M. G. (2025). A neural network model of flexible decision-making with episodic memory. Multidisciplinary Conference on Reinforcement Learning and Decision Making.
- Lu, Q.**, Norman, K. A., & Shohamy, D. (2024). [A Normative Account of the Influences of Contextual Familiarity and Novelty on Episodic Memory Policy](#). Conference on Cognitive Computational Neuroscience.
- Li, M., Jensen, K. T., **Lu, Q.**, Zhang, Q., & Mattar M. G. (2024). [Modeling Multiplicity of Strategies in Free Recall with Neural Networks](#). Conference on Cognitive Computational Neuroscience.
- Lu, Q.**, Hummos, A., & Norman, K. A. (2024). [Episodic memory supports the acquisition of structured task representations](#). Proceedings of the Annual Meeting of the Cognitive Science Society 46 (46).
- Lu, Q.**, Nguyen, T., Hasson, U., Griffiths, T. L., Zacks, J. M., Gershman, S. J., & Norman, K. A. (2023). [Toward a more neurally plausible neural network model of latent cause inference](#). Conference on

- Cognitive Computational Neuroscience.
- Dong, C., **Lu, Q.**, & Norman, K. A. (2023). [Strategic control of episodic memory through post-gating](#). Conference on Cognitive Computational Neuroscience.
- Lu, Q.**, Fan, Z. Y.*., Hasson, U., & Norman, K. A. (2019) [Optimal timing for episodic retrieval and encoding for event understanding](#). Conference on Cognitive Computational Neuroscience.
- Lu, Q.**, Chen, P. H., Pillow, J. W., Ramadge, P. J., Norman, K. A., & Hasson, U. (2018). [Shared Representational Geometry Across Neural Networks](#). The workshop on Integration of Deep Learning Theories, Neural Information Processing Systems (NeurIPS).
- Lu, Q.**, Hasson, U., & Norman, K. A. (2018). [Modeling hippocampal-cortical dynamics during event processing](#). 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](#). Conference on Cognitive Computational Neuroscience.
- Chen, C.*., **Lu, Q.**, Beukers, A. Baldassano, C., & Norman, K.A. (2018). [Generalized schema learning by neural networks](#). Conference on Cognitive Computational Neuroscience.

Honors and Awards

- 2021-2022 **Graduate Student Fellowship in Cognitive Science**, Princeton University.
- 2021 **Certificate of Excellence**, for teaching the deep learning course, Neuromatch Academy.
- 2018 **Charles W. Lummis Scholarship**, Princeton University.
- 2017 **First Year Fellowship in Natural Sciences and Engineering**, Princeton University.
- 2017 **College of Letters & Science Dean's Prize**, UW-Madison.
The highest undergraduate honor awarded by the dean to the three most academically outstanding students of the 2017 class.
- 2017 **Undergraduate Academic Achievement Award**, UW-Madison.
- 2017 **Outstanding Undergraduate Research Scholar Award**, UW-Madison.
Department level nomination-based award; Department of Psychology
- 2016 **David H. Durra Scholarship**, UW-Madison.
High achieving student in physical sciences or mathematics.
- 2016 **Undergraduate Travel Awards**, UW-Madison.
- 2015 **Hilldale Undergraduate Research Fellowship**, UW-Madison.
\$4,000 of research funds
- 2015 **Phi Beta Kappa as a Junior**, UW-Madison.
- 2015 **Bromley Research Conference Travel Grant**, UW-Madison.
- 2015 **Stanford CSLI Summer Research Internship**, Stanford University.
- 2014, 2015 **Undergraduate Research Scholar Award**, UW-Madison.
Nominated by Dr.Maryellen MacDonald & Dr.Timothy Rogers
- 2014 **Welton Summer Sophomore Research Grant**, UW-Madison.
\$2,500 of research funds

Teaching

- 2025/04 **Guest lecturer**, Workshop on Neural Network Models of Human Memory.
- 2025/05 University of Hong Kong; Hong Kong University of Science and Technology
- 2021/07-08 **TA, Deep Learning**.
Neuromatch Academy

- 2021 Spring **TA**, ELE|NEU|PSY 480 fMRI Decoding: Reading Minds Using Brain Scans.
 2018 Fall Prof: Ken Norman & Peter Ramadge; Princeton University
- 2020 Spring **TA**, NEU 350 Laboratory in Principles of Neuroscience (2-week fMRI lab).
 2018 Spring Prof: Alan Gelperin & Anthony Ambrosini; Princeton University
- 2019 Spring **TA**, NEU|PSY 330 Computational Modeling of Psychological Function.
 Prof: Jon Cohen; Princeton University
- 2019/11, **Guest lecturer**, Functional Alignment for fMRI data.
 2019/01 BrainIAK workshop at Princeton University
- 2018/08 **Guest lecturer**, Introduction to Multivariate Pattern Analysis.
 BrainIAK workshop at Princeton University

Research Mentoring

PhD students, co-mentored

- 2023- Moufan Li, PhD student in Psychology, NYU
 2023- Yukang Yang, PhD student in Electrical and Computer Engineering, Princeton
 2023- Ariadne Letrou, PhD student in Psychology, Princeton
 2022-2023 Cody Dong, PhD student in Psychology, Princeton

Undergraduate students

- 2020-2021 Carson Wardell, undergraduate senior thesis in Neuroscience, Princeton.
 2018-2019 Kathy Fan, undergraduate senior thesis in Computer Science, Princeton.
 2018 Noam Miller, summer research intern, Princeton.
 2017-2018 Catherine Chen, undergraduate senior thesis in Computer Science, Princeton.

Ad Hoc Review

- Journal Nature Communications
 Philosophical Transactions of the Royal Society B
 Journal of Cognitive Neuroscience
 Communications Psychology
 Scientific Reports
 Neurobiology of Learning and Memory
- Conference Conference on Cognitive Computational Neuroscience (CCN)
 Annual Meeting of the Cognitive Science Society (CogSci)
 Neural Information Processing Systems (NeurIPS)
 International Conference for Learning Representations (ICLR)
 Conference on the Mathematical Theory of Deep Neural Networks (DeepMath)

Service

- 2024, 2025 **Judge**, Princeton Research Day, Princeton.
 2024 **Organizer**, Manhattan Area Memory Meeting, Yale University.
 2023 **Application Mentor**, Graduate Program Application Support Group, Empowering Diversity and Promoting Scientific Equity, Princeton Neuroscience Institute.
- 2020-2023 **Contributor/Code reviewer**, Brain Imaging Analysis Kit, PNI-Intel collaboration.
 2020-2021 **Committee Member**, Psychology Graduate Student Committee, Princeton.
 2018-2021 **Organizer**, The Parallel Distributed Processing (PDP) meeting, Princeton.

2020 **Organizer**, Conference on the Mathematical Theory of Deep Neural Networks.

2014-2017 **Student Representative**, Faculty Honors Committee, UW-Madison.

Open Source Contributions

Software [BrainIAK](#): Advanced neuroimaging data analyses in python

[PsyNeuLink](#): Neuro/cognitive computational modeling in python

Dataset [META](#): a controlled naturalistic video dataset for studying event cognition

Languages

Mandarin Chinese (native), English

References

Kenneth A. Norman ^{1,2} knorman@princeton.edu Huo Professor in Computational and Theoretical Neuroscience Princeton University	Ph.D. advisor, primary
Uri Hasson ^{1,2} hasson@princeton.edu Professor Princeton University	Ph.D. advisor, secondary
Daphna Shohamy ^{3, 4, 5} ds2619@columbia.edu Director and CEO of Zuckerman Institute; Kavli Professor of Brain Science Columbia University	Postdoctoral advisor
Stefano Fusi ^{3, 4, 6, 7} sf2237@columbia.edu Professor Columbia University	Postdoctoral advisor

- 1: Princeton Neuroscience Institute, Princeton University
- 2: Department of Psychology, Princeton University
- 3: Mortimer B. Zuckerman Mind, Brain, Behavior Institute, Columbia University
- 4: Kavli Institute for Brain Science, Columbia University
- 5: Department of Psychology, Columbia University
- 6: Department of Neuroscience, Columbia University
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