

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 behavioral and neuroimaging experiments to test the model predictions.

Academic Positions

To start 2026/01 **Presidential Assistant Professor**
Department of Neuroscience, City University of Hong Kong.

2023/12-present **Alan Kanzer Postdoctoral Fellow**
The Mortimer B. Zuckerman Mind Brain Behavior Institute, Columbia University
Center for Theoretical Neuroscience, Columbia University .
Advisors: Daphna Shohamy, Stefano Fusi

2023/06-12 **Postdoctoral Research Associate** (transitional position)
Princeton Neuroscience Institute (PNI), 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.**
Computational modeling and machine learning for [wrist-based EMG neural interfaces](#).
Managers: Abigail Russo, Diogo Peixoto & David Sussillo

2015/05-09, 2016/05-09 **Research Intern, The Parallel Distributed Processing Lab, Stanford University.**
Neural network modeling of mathematical cognition.
Advisor: James L. McClelland

Papers & Preprints (*: undergraduate mentee)

- Dong, V. C., **Lu, Q.**, Norman, K. A. & Michelmann, S. (under revision). Towards Large Language Models with Human-Like Episodic Memory.
- 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., 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., 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

- 2025/04 Department of Psychology, The University of Hong Kong. Host PI: Xiaoqing Hu
- 2025/04 Affective, Neuroscience, and Decision-making Lab, University of Macau. PI: Haiyan Wu
- 2025/04 Department of Psychology, Chinese University of Hong Kong. Host PI: Xiaonan Liu
- 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. Host: Haiyang Geng

2023/11 Mattar Lab. New York University. PI: Marcelo Mattar
 2023/10 Department of Psychology, The University of Hong Kong. Host PI: Xiaoqing Hu
 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 T.K., **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 T.K., **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, Awards & Fellowships

- 2023-2026 **Alan Kanzer Postdoctoral Fellowship**, Columbia University.
\$80,000 annual costs
- 2021-2022 **Graduate Student Fellowship in Cognitive Science**, Princeton University.
- 2021 **Certificate of Excellence**, for teaching a Deep learning course, NeuromatchAcademy.
- 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
- 2014 **International Undergraduate Writing Contest 3rd Place**, UW-Madison.
- 2014 **Margaret E. and Allard Smith Scholarship**, UW-Madison.
High achieving first-year student

Teaching

- 2025/04 **Guest lecturer**, Neural network models of human memory.
Memory model workshop at Hong Kong University
- 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 with other PIs

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	Communications Psychology
	Journal of Cognitive Neuroscience	Scientific Reports
	Neurobiology of Learning and Memory	ReScience

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.
Contributed to the shared response model and intersubject correlation methods; code review
2019-2023 **Photographer**, in collaboration with the Princeton Office of Communications.
Works featured at Princeton University Website (e.g., [1](#), [2](#), [3](#)), Official Princeton Social Media (e.g., [1](#), [2](#), [3](#)), Princeton Alumni Weekly (e.g., [1](#), [2](#), [3](#)), etc. Here's my [online gallery](#).
2020-2021 **Committee Member**, Psychology Graduate Student Committee, Princeton.
Co-initiated a peer-mentoring program to support first-year graduate students during COVID19.
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.
Reviewed scholarship, research grant applications, and updates in Honors program policy.
2013-2014 **Tutor for Mathematics**, Greater University Tutoring Service, 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} Ph.D. advisor, primary
knorman@princeton.edu
Huo Professor in Computational and Theoretical Neuroscience
Princeton University

Uri Hasson^{1,2} Ph.D. advisor, secondary
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Professor
Princeton University

Daphna Shohamy^{3, 4, 5} Postdoctoral advisor
ds2619@columbia.edu
Director and CEO of Zuckerman Institute; Kavli Professor of Brain Science
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- 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
- 7: Center for Theoretical Neuroscience, Columbia University

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