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Qihong Lu

Education & Academic Appointments

2023/12-present **Postdoctoral Research Scientist & Alan Kanzer Postdoctoral Fellow**
Center for Theoretical Neuroscience, Zuckerman Institute, Columbia University.
Advisors: Daphna Shohamy, Stefano Fusi

2023/06-12 **Postdoctoral Research Associate** (transitional position)
Princeton Neuroscience Institute (PNI), Princeton University.
Advisor: Ken Norman

2017-2023 **Ph.D. & M.A., Cognitive Psychology**
Princeton University.
Advisors: Ken Norman, Uri Hasson
Dissertation Committee: Ken Norman, Uri Hasson, Tom Griffiths, Sam Gershman, Jeff Zacks

2013-2017 **B.S., Mathematics & Psychology**
University of Wisconsin-Madison.
Advisor: Tim Rogers
Graduated with Comprehensive Honors (college-level highest honors)
Certificate in Computer Science

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)

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. (2023; under review). Reconciling shared versus context-specific information in a neural network model of latent causes. arXiv.

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.

▬▬▬ Invited & External Talks

2024/07	Annual Meeting of the Cognitive Science Society (Cogsci). Rotterdam, Netherlands.
2024/05	Context and Episodic Memory Symposium (CEMS). University of Pennsylvania
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	Penn 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
2021/02	Dynamic Memory Lab. University of California, Davis. PI: Charan Ranganath
2021/03	Invited Symposium on How Prior Knowledge Shapes Encoding of New Memories. Cognitive Neuroscience Society Annual Meeting (CNS)
2020/08	Context and Episodic Memory Symposium (CEMS), University of Pennsylvania
2020/03	Neuromatch Conference (NMC)

▬▬▬ Peer-Reviewed Conference Proceedings (*: undergraduate mentee)

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. The Conference on Cognitive Computational Neuroscience.

Dong, C., **Lu, Q.**, & Norman, K. A. (2023). Strategic control of episodic memory through post-gating. The 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. The 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. 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.

▬▬▬ Other Conference Posters (∗: undergraduate mentee)

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. The Organization for Human Brain Mapping Annual Meeting.

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. 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. The Organization for Human Brain Mapping Annual Meeting.

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. The Annual Meeting of the Society for Neuroscience.

Lu, Q., Ramadge, P., Norman, K. A. & Hasson, U. (2018). Measuring representational similarity across neural networks. The 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. The Annual Meeting of the Cognitive Science Society.

Lu, Q., & McClelland, J. L. (2016). Teaching a neural network to count: reinforcement learning with "social scaffolding". The 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. The Cognitive Neuroscience Society annual conference.

▬▬▬ Honors, Awards & Fellowships

2023-2025 **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

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

Ad Hoc Review

Journal	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)

Research Mentoring

2020-2021	Carson Wardell, Senior Thesis, Neuroscience, Princeton.

2018-2019	Kathy Fan, Senior Thesis, Computer Science, Princeton.
2018 Summer	Noam Miller, Summer Research Intern, Princeton.
2017-2018	Catherine Chen, Senior Thesis, Computer Science, Princeton.

Service

2024	**Organizer**, Manhattan Area Memory Meeting, Yale University.
2024	**Judge**, Princeton Research Day, Princeton.
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

Technical Skills

Python (pytorch, keras), Git, bash script, Matlab, R, LaTeX, Adobe Photoshop & Lightroom

Languages

Mandarin Chinese (native), English

Last updated on April 5, 2024