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Qihong Lu

Research Positions

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

Education

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; Certificate in Computer Science**
University of Wisconsin-Madison.
Graduated with Comprehensive Honors (college-level highest honors)
Advisor: Tim 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)

Lu, Q., Hummos, A., & Norman, K. A. (2024). Episodic memory supports the acquisition of structured task representations. bioRxiv.

Lu, Q., Nguyen, T., Zhang Q., Hasson, U., Griffiths, T. L., Zacks, J. M., Gershman, S. J., & Norman, K. A. (2023). 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).

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. 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.

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.

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

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)

Teaching

2021/07-08 **TA**, Deep Learning.
Neuromatch Academy

2021 Spring, 2018 Fall **TA**, ELE|NEU|PSY 480 fMRI Decoding: Reading Minds Using Brain Scans.
Prof: Ken Norman & Peter Ramadge; Princeton University

2020 Spring, 2018 Spring **TA**, NEU 350 Laboratory in Principles of Neuroscience (2-week fMRI lab).
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, 2019/01 **Guest lecturer**, Functional Alignment for fMRI data.
BrainIAK workshop at Princeton University

2018/08 **Guest lecturer**, Introduction to Multivariate Pattern Analysis.
BrainIAK workshop at Princeton University

Research Mentoring

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

2018-2019 Kathy Fan, Senior Thesis, Computer Science, Princeton.

2018 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 May 7, 2024