

Thomas Zhihao Luo, Ph.D.
Postdoctoral Research Associate
Princeton Neuroscience Institute
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Education

- 2017 Ph.D. in Neurobiology
Harvard University, Cambridge, MA
Advisor: John H. R. Maunsell, Ph.D.
Dissertation: "Neuronal mechanisms of attention: changes in behavioral sensitivity and criterion"
- 2011 A.B. in Neurobiology, 2011
Harvard University, Cambridge, MA

Employment

- 2016-present Postdoctoral research fellow
Advisor: Carlos D. Brody, Ph.D.
Princeton University

Awards and Honors

- 2017-2020 Ruth L. Kirschstein National Research Service Award F32, NIH
2014-2016 Ruth L. Kirschstein National Research Service Award F31, NIH
2016 Travel Award, University of Rochester Center for Visual Sciences Symposium
2015 Best Student Poster Award, The University of Chicago Department of Neurobiology Retreat
2013, 2012 Honorable Mention, NSF Graduate Research Fellowship Program
2011 Certificate of Distinction in Teaching Award, Harvard University
2010 Certificate of Distinction in Teaching Award, Harvard University

Teaching and Mentoring

- 2017-present Mentor for graduate and postbac. students
2023-present Wynne Stagnaro, graduate student
2021-present Timothy D. Kim, graduate student
2020-2022 Verity A. Elliott, postbac.
2017-2018 Diksha Gupta, graduate student (now postdoc. at Sainsbury Welcome)
- 2020-2023 Teaching assistant, "An Introduction to Decision Neuroscience," Viax.org
2020-2021 Mentor, Princeton EPSP Peer Mentoring Circle
2012-2013 Mentor, Summer Honors Undergraduate Research Program
2011-2013 Mentor, Hinton Scholars AP Biology Program
2011-2012 Mentor, Health Professions Exposure and Recruitment Program
2010-2011 Teaching assistant, "Linear Algebra and Real Analysis," Harvard University

Service

- 2023 Reviewer, Computational & Systems Neuroscience conference (COSYNE)
2022 Chair, Society for Neuroscience (SfN) Nanosymposium

"Neuronal mechanisms of decision-making"

2020-2021	Committee member, Princeton Neuroscience Institute Seminar Committee
2019	Technical support, "Meet the expert" at SfN Neuropixels booth
2013-2014	Organizer, Harvard PhD Program in Neuroscience Journal Club
2013-2014	Organizer, Harvard Medical School Department of Neurobiology Systems Club

Publications

Bondy, A.G.[‡], Charlton, J.A.[‡], **Luo, T.Z.**[‡], Kopec, C.D., Stagnaro, W.M., Venditto, S.J.C., Lynch, L., Janarthanan, J., Oline, S.N., Harris, T.D., Brody, C.D. (2024) Coordinated cross-brain activity during accumulation of sensory evidence and decision commitment. [bioRxiv](#). **‡equal contribution, alphabetically listed.**

Kopec, C.D., **Luo, T.Z.**, Bondy, A.G., Gupta, D., Elliott, V.A., Charlton, C., Breda, J.R., Stagnaro, W.M., Reyes, E.J., Sirko, A.I., Bustos, A.F., Willock, J.M., Morrison, J.M., Osorio, K.L., Brody, C.D. (2024) To integrate or not to integrate: Testing degenerate strategies for solving an accumulation of perceptual evidence decision-making task. [bioRxiv](#)

Gupta, D., Kopec, K., Bondy, A.G., **Luo, T.Z.**, Elliott, V.A., Brody, C. (2024) A multi-region recurrent circuit for evidence accumulation in rats. [bioRxiv](#)

Luo, T.Z.^{*}, Kim, T.D.^{*}, Gupta, D., Bondy A.G., Kopec, C.D., Elliot, V.A., DePasquale, B. Brody, C.D. (2023) Transitions in dynamical regime and neural mode underlie perceptual decision-making. [In revision. bioRxiv](#). ^{*}equal contribution

Kim, T.D., **Luo, T.Z.**, Can, T., Krishnamurthy, K., Pillow, J.W., Brody, C. (2023) Flow-field inference from neural data using deep recurrent networks. [bioRxiv](#)

Kim, T.D., **Luo, T.Z.**, Pillow, J.P., Brody, C.D. (2021) Inferring latent dynamics underlying neural population activity via neural differential equations. [International Conference on Machine Learning](#)

Luo, T.Z.^{*}, Bondy, A.G.^{*}, Gupta, D., Elliot, V.A., Kopec, C.D., Brody, C.D. 2020. An approach for long-term, multi-probe Neuropixels recordings in unrestrained rats. [eLife](#). ^{*}equal contribution

Luo, T.Z., Maunsell, J.H.R., 2019. Attention can be subdivided into neurobiological components corresponding to distinct behavioral effects. [PNAS](#)

Luo, T.Z., Maunsell, J.H.R., 2018. Attentional changes in either criterion or sensitivity are associated with robust modulations in prefrontal cortex. [Neuron](#). *Reviewed in a Previews article*

Luo, T.Z., Maunsell, J.H.R., 2015. Neuronal modulations in visual cortex are associated with only one of multiple components of attention. [Neuron](#). *Reviewed in a Previews article*

Selected talks

"Transitions in dynamical regime and neural mode underlie perceptual decision-making" (2024) *Computational and Systems Neuroscience (COSYNE)*. [Video recording](#). (2.7% of submissions selected for talks)

"Neural dynamics underlying perceptual decision-making" (2024) *Computational and Systems Neuroscience (COSYNE) Workshop*

"Distinct mechanisms for evidence accumulation and choice memory explain diverse neuronal dynamics." (2023) *Sunposium at Max Planck, Florida*

"Neuronal representations of the decision variable underlying perceptual choices are time-varying." (2022) *Society for Neuroscience (SfN)*

“History-dependent biases compete with evidence by shifting the prior of the choice options.” (2022) *Society for Neuroeconomics (SNE)*

Meeting abstracts

Luo, T.Z*, Kim, T.D*, Gupta, D., Bondy A.G., Kopec, C.D., Elliot, V.A., DePasquale, B. Brody, C.D. (2024) Transitions in dynamical regime and neural mode underlie perceptual decision-making. *Computational and Systems Neuroscience (COSYNE)*. ***equal contribution**

Bondy, A.G[#], Charlton J.A[#], **Luo, T.Z[#]**, Venditto S.J., Stagnaro W., Kopec C.D., Brody C.D. (2024). Simultaneous brainwide recordings reveal a cortico-striatal subnetwork mediating perceptual choice. *Computational and Systems Neuroscience (COSYNE)*. **#equal contribution, alphabetical**

Luo, T.Z., Kim, T., DePasquale, B., Brody, C.D. (2023) Distinct mechanisms for evidence accumulation and choice memory explain diverse neuronal dynamics. *Computational and Systems Neuroscience (COSYNE)*

Luo, T.Z., Kim, T., DePasquale, B., Brody, C.D. (2022) Inference of the time-varying relationship between spike trains and a latent decision variable. *Computational and Systems Neuroscience (COSYNE)*

Luo, T.Z., Bondy, A.G., Gupta D., Elliot, V.A., Kopec, C.D., Brody, C.D. (2021) Evidence accumulation and suppression of trial history-related influence by dorsomedial frontal cortex. *SfN*

Luo, T.Z., Hanks, T.D., Gupta, G., Bondy, A.G., Brody, C.D. (2021) Dorsomedial frontal cortex participates in both evidence accumulation and trial history-based updating during perceptual decision-making. *Computational and Systems Neuroscience (COSYNE)*

Luo T.Z., Hanks T.D., Gupta D., Bondy, A.G., Brody C.D. (2020) Dorsomedial frontal cortex participates in both evidence accumulation and trial history-based updating during perceptual decision-making. *Society for Neuroscience (SfN)*

Luo T.Z., Bondy A.G., Depasquale B., Brody C.D. (2020) The anterior dorsomedial frontal cortex is causally involved in regulating the time constant of evidence accumulation. *Computational and Systems Neuroscience (COSYNE)*

Luo, T.Z., Bondy, A.G., Brody, C.D. (2019) Chronic recording using Neuropixels probes in freely moving rats accumulating auditory evidence. *Society for Neuroscience (SfN)*

Luo, T.Z., Maunsell, J.H.R. (2016) Neuronal modulations in prefrontal cortex are associated with multiple components of visuospatial attention. *Society for Neuroscience (SfN)*

Luo, T.Z., Maunsell, J.H.R. (2015) Distinct neurobiological mechanisms of top-down attention. *Society for Neuroscience (SfN)*

Luo, T.Z., Maunsell, J.H.R. (2015). Distinct neurobiological mechanisms of top-down attention. *Computational and Systems Neuroscience (COSYNE)*