

Nicholas T Franklin

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Education

Brown University, PhD, Cognitive Science 2018
Dissertation: Compositionality in Human Structure Learning

The University of Texas at Austin, Austin, TX 2009
BS, Neurobiology; BA, Spanish

Employment History

Flagship Pioneering Cambridge, MA 2023-
Senior Scientist, Machine Learning
Research in machine learning for biology and chemistry

Hyperscience New York, NY 2021-2022
Applied Scientist
Research in computer vision and natural language processing.

Harvard University Cambridge, MA 2017-2021
Postdoctoral Fellow
Advisor: Samuel J Gershman

Brown University Providence, RI 2011-2017
Graduate Researcher
Advisor: Michael J Frank

Weill Cornell Medical College New York, NY 2009-2011
Research Assistant
Advisor: BJ Casey

Publications

Liu, A., Elaldi, A., **Franklin, N. T.**, Russell, N., Atwal, G. S., Ban, Y. E. A., Viessmann, O. (2025). Flash Invariant Point Attention. *arXiv preprint arXiv:2505.11580*.

Beukers, A. O., Collin, S. H., Kempner, R. P., **Franklin, N. T.**, Gershman, S. J., & Norman, K. A. (2024). Blocked training facilitates learning of multiple schemas. *Communications Psychology*

Franklin N.T., & Frank, M. J. (2020). Generalizing to generalize: humans flexibly switch between compositional and conjunctive structures during reinforcement learning. *PLoS Computational Biology*.

Franklin N.T., Norman K.A., Ranganath C., Zacks J.M., Gershman S.J., (2020). Structured event memory: a neuro-symbolic model of event cognition. *Psychological Review*

Schulz E.*, **Franklin N.T.***, Gershman S.J., (2020). Finding structure in multi-armed bandits. *Cognitive Psychology*.
* denotes equal contribution

Franklin N.T., & Frank, M. J. (2018). Compositional clustering in task structure learning. *PLoS Computational Biology*, 14(4).

Franklin N.T., & Frank, M. J. (2015). A cholinergic feedback circuit to regulate striatal population uncertainty and optimize reinforcement learning. *Elife*, 4.

Teslovich, T., Mulder, M., **Franklin N.T.**, Ruberry, E. J., Millner, A., Somerville, L. H., Simen, P.,

Durstun, S. & Casey, B. J. (2014). Adolescents let sufficient evidence accumulate before making a decision when large incentives are at stake. *Developmental Science*, 17(1), 59-70.

Casey, B. J., Somerville, L. H., Gotlib, I. H., Ayduk, O., **Franklin N.T.**, Askren, M. K., Jonides J., Berman M. G., Wilson N. L., Teslovich T., & Glover, G (2011). Behavioral and neural correlates of delay of gratification 40 years later. *Proceedings of the National Academy of Sciences*, 108(36).

Invited Talks

<i>Structured Event Memory</i> , University of California, Davis, Ranganath Lab	2020
<i>Structured Event Memory</i> , Duke University, De Brigard Lab	2020
<i>Structured Event Memory</i> , Harvard Medical School, Krieman Lab	2020
<i>What is Open Science?</i> Max Plank Institute, Tübingen, Germany	2020
“Becoming a better scientist” workshop	
<i>Structured Event Memory</i> , Boston College, Anzellotti Lab (cancelled due to COVID- 19 outbreak)	2020
<i>Finding structured multi-armed Bandits</i> Harvard University,	2019
<i>New England Research on Decision Making</i> mini-conference	
<i>Structured Event Memory</i> Brown University, Nassar Lab	2019
<i>Structured Event Memory</i> Princeton University, Norman Lab	2018
<i>Compositional generalization in human structure learning</i> New York University,	2018
ConCats seminar series	

Conference Presentations

Franklin N.T., & Frank M.J. (2019). Compositional task structure clustering. Talk presented at the *Structure for Efficient Reinforcement Learning (SERL) workshop* at the 4th *Multidisciplinary Conference on Reinforcement Learning and Decision Making* (co-organizer)

Franklin N.T., & Schulz, E., & Gershman S.J. (2019). Structured Multi-armed Bandits. Poster presented at the 4th *Multidisciplinary Conference on Reinforcement Learning and Decision Making*.

Franklin N.T., & Schulz, E., & Gershman S.J. (2019). Finding structured multi-armed Bandits. Talk presented at the *New England Research on Decision Making* mini-conference

Franklin N.T., & Gershman S.J. (2018). Structured event memory: a structured probabilistic model of event cognition. Poster presented at the *The 51st Society for Mathematical Psychology & 16th International Conference on Cognitive Modeling Meetings*

Franklin N.T., & Frank M.J. (2017). Compositional Task Clusters in Human Transfer Learning. Poster presented at the *The 3rd Multi-disciplinary Conference on Reinforcement Learning and Decision Making*

Franklin N.T., & Frank M.J. (2017). A Cholinergic Feedback Mechanism to Modulate Dopaminergic Learning within the Striatum in Response to Striatal Population Uncertainty. Poster presented at the *50th Meeting of the Winter Conference on Brain Research*

Franklin N.T., & Frank M.J. (2016). Independent generalization of action-effects and outcome-values in multistep and goal-directed learning. Poster presented at the *38e Symposium International du GRSNC, The Neuroscience of Decision Making*

Franklin N.T., & Frank M.J. (2016). Generalization in goal-directed learning: benefits of independent clustering of world-model and goals. Poster presented at the *23rd Annual Meeting of the Cognitive Neuroscience Society*

Franklin N.T., & Frank M.J. (2016). Generalization in goal-directed learning: independent clustering of action- effect and outcome-values. Poster presented at the *Computational and Systems Neuroscience (Cosyne)*

Franklin N.T., & Frank M.J. (2015). Independent clustering and generalization of action-outcome and outcome-values in goal-directed learning. Talk presented at the *45th Annual Meeting of the Society for Neuroscience*

Franklin N.T., & Frank M.J.. (2014). A Bayesian perspective on flexibly responding to stochastic and non-stationary task: a role for striatal acetylcholine. Poster presented at the *Computational and Systems Neuroscience (Cosyne)*

Franklin N.T., & Frank M.J. (2013). Contributions of tonically active neurons and uncertainty to striatal learning. Poster presented at the *43rd Annual Meeting of the Society for Neuroscience*

Franklin N.T., & Frank M.J. (2013). Uncertainty and the striatum: How tonically active neurons may aid learning in dynamic environments. Poster presented at the *Computational and Systems Neuroscience (Cosyne)*

Franklin N.T., & Dominick A. (2009). The Role of Attention in Reward Motivated Learning. Poster presented at the *The University of Texas at Austin College of Natural Sciences Undergraduate Forum*

Fellowships & Awards

Kenneth R. and Pamela L. Galner Fund Dissertation Fellowship	2016
Excellence in Human Development, Family, & Social Science Res, UT Austin	2009
Undergraduate Research Fellowship, UT at Austin	2009
<i>Phi Beta Kappa</i>	2008

Professional Service

ad-hoc Reviewing

Behavioral and Brain Sciences, Biological Psychiatry, Behavioral Brain Research, Cognition, Cognition & Emotion, CogSci, Connection Science, Cosyne, eLife, Journal of Neuroscience, Nature, Nature Neuroscience, Neuropsychopharmacology, PLoS Computational Biology, Scientific Reports

Guest Editor

PLoS Computational Biology

Workshop Organizing

Structure for efficient reinforcement learning.	2019
<i>Workshop at the 4th Multidisciplinary Conference on Reinforcement Learning and Decision Making.</i>	
<i>Co-organizer with Eric Schulz</i>	

Other Service

Co-led Workshop on Open Science for Harvard Psychology	2019
Organized Brown CLPS department Cognition Seminar Series	2014-2015

Students Supervised

Prashant Raju (Cognitive Science)	2020
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Undergraduate Students

Gargi Singh (Visiting Computer Science Student)	2020
Jerry Tang (Computer Science)	2017-2018
Michael Opara (Computer Science)	2018

Teaching Experience

Teaching assistant. Computational Cognitive Neuroscience	2013-14, 2016
Teaching assistant. Introduction to Cognitive Neuroscience	2014
Teaching assistant. Computational Cognitive Science	2013

Skill

Computational methods and machine learning

Generative neural networks (autoregressive models, variational inference, generative flow nets), reinforcement Learning, non-parametric Bayesian methods (Gaussian processes, non-parametric clustering), graphical models, computer vision, non-convex optimization, stochastic methods, attractor neural networks

Programming

Python, PyTorch, NumPy, Git, Javascript, HTML, CSS

Spoken Languages

English (native), Spanish (proficient professionally), French (intermediate)