

# Brian DePasquale

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## Academic Positions

<b>Princeton University</b>	Princeton, NJ
Postdoctoral Research Associate Advisors: Jonathan Pillow & Carlos Brody	2016–present
<b>Columbia University</b>	New York, NY
Ph.D. in Neurobiology & Behavior Advisor: Larry Abbott	2016
<b>Massachusetts Institute of Technology</b>	Cambridge, MA
Research and Technical Assistant Laboratory of Ann Graybiel	2005–2009
<b>Fordham University</b>	Bronx, NY
B.S. in Physics, <i>cum laude</i> Victor F. Hess Award (top graduating physics student)	2005

## Publications & Manuscripts

[[Google scholar](#)]

- [1] **DePasquale, B.**, Brody, C. D., & Pillow, J. (2021). A latent variable model of evidence accumulation jointly fit to neural activity and behavioral choices of rats. *in preparation*.
- [2] **DePasquale, B.**, Sussillo, D., Churchland, M.M., & Abbott, L.F. (2020). The centrality of population-level factors to network computation is demonstrated by a versatile approach for training spiking networks. *under review*.
- [3] Cohen, Z., **DePasquale, B.**, Aoi, M., & Pillow, J. (2020). Recurrent dynamics of prefrontal cortex during context-dependent decision-making. *bioRxiv*, <https://doi.org/10.1101/2020.11.27.401539>. [[bioRxiv](#)].
- [4] Pinto L., Rajan K., **DePasquale B.**, Thiberge S.Y., Tank D.W., Brody C.D. (2019) Task-dependent changes in the large-scale dynamics and necessity of cortical regions. *Neuron*, 104(4), 810-824. e9. [[journal](#)]
- [5] Panichello, M.F., **DePasquale, B.**, Pillow, J.W. & Buschman, T.J. (2019). Error-correcting dynamics in visual working memory. *Nature Communications* 10, Article number: 3366 July 2019 10.1038/s41467-019-11298-3. [[journal](#)]
- [6] Insanally, M.N., Carcea, I., Field, R.E., Rodgers, C., **DePasquale, B.**, Rajan, K., DeWeese, M.R., Albanna, B.F. & Froemke, R.C. (2018). Spike-timing-dependent ensemble encoding by non-classically responsive cortical neurons. *eLife* 8, e42409. [[journal](#)]
- [7] **DePasquale, B.**, Cueva, C.J., Rajan, K., Escola, G.S. & Abbott, L.F. (2018). full-FORCE: A target-based method for training recurrent networks. *PLoS ONE* 13(2): e0191527. [[journal](#)]
- [8] **DePasquale, B.** (2016). *Methods for Building Network Models of Neural Circuits*. Ph.D. thesis, Columbia University. [[Columbia digital repository](#)]

- [9] Abbott, L.F., **DePasquale, B.** & Memmesheimer, R.-M. (2016). Building functional networks of spiking model neurons. *Nature Neuroscience* 19:350-355. [journal]
- [10] **DePasquale, B.**, Churchland, M.M. & Abbott, L.F. (2016). Using firing-rate dynamics to train recurrent networks of spiking model neurons. arXiv:1601.07620. [arXiv]
- [11] Feingold, J., Gibson, D.J., **DePasquale, B.** & Graybiel, A.M. (2015). Bursts of beta oscillation differentiate postperformance activity in the striatum and motor cortex of monkeys performing movement tasks. *PNAS* 112(44):13687-13692. [journal]
- [12] Paninski, L., Vidne, M., **DePasquale, B.** & Ferreira, D.G. (2012). Inferring synaptic inputs given a noisy voltage trace. *Journal of Computational Neuroscience* 33:1-19. [journal]

<b>Research Support</b>	National Science Foundation Graduate Research Fellow	2010–2013
<b>Teaching &amp; Mentorship</b>	<b>COSYNE 2021 Tutorial</b> Teaching Assistant (with K. Rajan)	Winter 2021
	<b>Princeton University</b> Undergraduate research co-advisor (with J. Pillow) Teaching Assistant & Lecturer (with C. Brody), Math Tools for Neuroscience	2016–present  Fall 2019
	<b>Columbia University</b> TA, Introduction to Theoretical Neuroscience (graduate) Instructor, General Physics (undergraduate) Summer Health Professions Education Program	2011 & 2013 2013–2014
<b>Service &amp; Related Work</b>	<i>Ad hoc</i> reviewer  NeurIPS, eLife, Neural Computation, PNAS, Computational Cognitive Neuroscience (CCN), PLoS Comp Bio., Science Advances, ICLR	2012–present
	<b>Princeton Neuroscience Institute</b>  Departmental seminar series committee Prospective graduate student interviewer Science writer, neuroscience department website (invited)	2019-2020 2020 2020
	<b>Simons Collaboration on the Global Brain</b>  Annual meeting note taker (invited) Science news writer (invited)	New York, NY  2017-present 2020-present

**References**

Larry F. Abbott, Ph.D.  
William Bloor Professor of Theoretical Neuroscience  
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Carlos Brody, Ph.D.  
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Ann M. Graybiel, Ph.D.  
Institute Professor  
Massachusetts Institute of Technology  
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Jonathan Pillow, Ph.D.  
Associate Professor of Psychology  
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**Conference  
Proceedings &  
Talks**

Michele Insanally, Badr Albanna, **Brian DePasquale**, Saba Fadaei, Kanaka Rajan, Robert Froemke (2021). Distinct synaptic plasticity mechanisms determine the diversity of cortical responses during behavior. COSYNE.

Diksha Gupta, **Brian DePasquale**, Carlos D. Brody (2020). A common cause for multiple suboptimalities in perceptual decision-making. COSYNE.

Thomas Luo, Carlos D. Brody, Adrian Bondy, **Brian DePasquale** (2020). The anterior dorsomedial frontal cortex is causally involved in regulating the time constant of evidence accumulation. COSYNE.

Pinto L, Rajan K, **DePasquale B**, Thiberge SY, Tank DW, Brody CD (2019). Task-dependent changes in the large-scale dynamics and necessity of cortical regions. SFN.

**Brian DePasquale**, Carlos D. Brody, Jonathan Pillow (2019). An efficient, maximum likelihood based method for inferring latent variable models of evidence accumulation from neural activity. SCGB annual meeting, NYC.

**Brian DePasquale**, Carlos D. Brody, Jonathan Pillow (2019). Accumulated evidence inferred from neural activity accurately predicts behavioral choice. COSYNE.

**Brian DePasquale** (2018). Inferring models of evidence accumulation from neural activity. Princeton Neuroscience Institute Seminar Series.

Matthew Panichello, **Brian DePasquale**, Jonathan Pillow, Timothy Buschman (2018). Memory load modulates the dynamics of visual working memory. Vision Sciences Society 18<sup>th</sup> Annual Meeting, St. Pete Beach, FL.

**Brian DePasquale**, Mark M. Churchland, LF Abbott (2016). Using firing-rate dynamics to train recurrent spiking neural networks. Recurrent Spiking Neural Networks—Dynamics, Learning, Computation, COSYNE Workshop, Salt Lake City, UT.

**Brian DePasquale**, Christopher J. Cueva, Raoul-Martin Memmesheimer, LF Abbott, G. Sean Escola (2016). Full-rank regularized learning in recurrently connected firing rate networks. COSYNE, Salt Lake City, UT.

**Brian DePasquale**, Mark M. Churchland, LF Abbott (2015). Using firing-rate dynamics to train recurrent spiking neural networks. Annual Tri-Center Gatsby Meeting, Columbia University, NY, NY.

**Brian DePasquale**, Mark M. Churchland, LF Abbott (2014). Using firing rate dynamics to train spiking neural networks that perform tasks. Techniques and Approaches in Theoretical Neuroscience, Janelia Farms Research Campus, HHMI, Ashburn, VA.

**Brian DePasquale**, Mark M. Churchland, LF Abbott (2014). Constructing networks of spiking neurons that perform tasks. Department of Neuroscience retreat, Columbia University, NY, NY.

**Brian DePasquale**, Mark M. Churchland, LF Abbott (2014). Firing rate dynamics from spiking networks. COSYNE, Salt Lake City, UT.

**Brian DePasquale**, Mark M. Churchland, LF Abbott (2013). Low-rank connectivity induces firing rate fluctuations in a chaotic spiking model. Temporal Dynamics in Learning: Networks and Neural Data, Janelia Farms Research Campus, HHMI, Ashburn, VA.

**Brian DePasquale**, Mark M. Churchland, LF Abbott (2013). Low-rank connectivity induces firing rate fluctuations in a chaotic spiking model. COSYNE, Salt Lake City, UT.

J Feingold, **Brian DePasquale**, AM Graybiel (2009). Modulation of beta power in the prefrontal cortex and Caudate Nucleus of monkeys during self-timed sequential arm movements. SFN 39<sup>th</sup> Annual Meeting, Chicago, IL

J Feingold, **Brian DePasquale**, AM Graybiel (2007). Cortical 8-20 Hz oscillations in supplementary motor areas during self-timed sequential arm movements in monkey. SFN 37<sup>th</sup> Annual Meeting, San Diego, CA