

TAIGA ABE

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<http://cellistigs.github.io>

Last updated: Jan 9, 2024

EDUCATION

Columbia University, New York, NY Sep 2017 — Nov 2023
PhD in Neurobiology and Behavior
Advisor: John P. Cunningham
Doctoral thesis: The role of model implementation in neuroscientific applications of machine learning

Harvard University, Cambridge, MA Sep 2013 — May 2017
AB in Neurobiology, Secondary in Mathematical Science
Magna cum laude with highest honors
Senior thesis: A computational study of adaptive behaviors in a mouse model of motor control

AWARDS AND HONORS

TMLR Featured Paper Certification (top 2% of submissions) 2024
NeurIPS “I Can’t Believe It’s Not Better!” Workshop - Most Surprising Result Award 2022
Herschel Smith Graduate Fellowship (Declined) 2017
Phi Beta Kappa 2017 — Present
William and Mary Lee Bossert Prize for Science 2016
Harvard College Research Program (HCRP) Research Award 2016
Mary Gordon Roberts Fellow 2016 — 2017

PUBLICATIONS

* denotes equal contribution

- [1] **T. Abe**, E. K. Buchanan, G. Pleiss, and J. P. Cunningham. Pathologies of predictive diversity in deep ensembles. *Transactions of Machine Learning Research*, 2024 [Featured Paper]
- [2] **T. Abe***, E. K. Buchanan*, G. Pleiss, R. Zemel, and J. P. Cunningham. Deep ensembles work, but are they necessary? *Advances in Neural Information Processing Systems*, 35:33646–33660, 2022
- [3] **T. Abe**, I. Kinsella, S. Saxena, E. K. Buchanan, J. Couto, J. Briggs, S. L. Kitt, R. Glassman, J. Zhou, L. Paninski, et al. Neuroscience cloud analysis as a service: An open-source platform for scalable, reproducible data analysis. *Neuron*, 110(17):2771–2789, 2022
- [4] J. Couto, S. Musall, X. R. Sun, A. Khanal, S. Gluf, S. Saxena, I. Kinsella, **T. Abe**, J. P. Cunningham, L. Paninski, et al. Chronic, cortex-wide imaging of specific cell populations during behavior. *Nature protocols*, 16(7):3241–3263, 2021
- [5] E. Batty, M. Whiteway, S. Saxena, D. Biderman, **T. Abe**, S. Musall, W. Gillis, J. Markowitz, A. Churchland, J. P. Cunningham, et al. Behavenet: nonlinear embedding and bayesian neural decoding of behavioral videos. *Advances in Neural Information Processing Systems*, 32, 2019
- [6] A. Mathis, P. Mamidanna, K. M. Cury, **T. Abe**, V. N. Murthy, M. W. Mathis, and M. Bethge. Deeplabcut: markerless pose estimation of user-defined body parts with deep learning. *Nature neuroscience*, 21(9):1281–1289, 2018

WORKSHOP PROCEEDINGS

- [1] **T. Abe***, E. K. Buchanan*, G. Pleiss, and J. P. Cunningham. The best deep ensembles sacrifice predictive diversity. In *NeurIPS I Can’t Believe It’s Not Better Workshop: Understanding Deep Learning Through Empirical Falsification*, 2022 [Oral Presentation] [Most Surprising Result Award]
- [2] D. Biderman, C. A. Naesseth, L. Wu, **T. Abe**, A. C. Mosberger, L. J. Sibener, R. Costa, J. Murray, and J. P. Cunningham. Inverse articulated-body dynamics from video via variational sequential monte carlo. In *NeurIPS Workshop on Differentiable Vision, Graphics, and Physics*, 2020

SELECTED TALKS AND POSTERS

- [1] *Surprises in ensembles of overparametrized neural networks*. Invited Talk, Simons Center for Computational Neuroscience. Nov 2, 2023
- [2] *Accelerating the development and adoption of neural data analysis tools with an open-source cloud platform*. Invited Talk, Datajoint Sciops Workshop. Sep 6, 2022
- [3] *Deep ensembles work, but are they necessary?* Invited Talk, G-Research. Aug 3, 2022
- [4] *Deep ensembles work, but are they necessary?* Poster, Columbia Data Science Day. Apr 6, 2022
- [5] *Computational methods for social behavior: From hand labeling to automated, scalable analysis pipelines*. Invited Talk, NYU Oxytocin Working Group. Jun 18, 2020
- [6] *Automated analysis of spontaneous interactions in a persistent social environment*. Invited Talk, Cosyne 2019 Workshop: Quantifying Social Behaviors: Computational challenges and experimental pitfalls. Mar 5, 2019

PROFESSIONAL SERVICE

Journal Reviewer, Nature Methods
Journal Reviewer, Journal of Machine Learning Research (JMLR)
Reviewer, Neural Information Processing Systems (NeurIPS)
Reviewer, International Conference on Machine Learning (ICML)
Reviewer, Journal of Open Source Software (JOSS)

ADVISING

Project Supervisor

John Briggs, Undergraduate, Mechanical Engineering	2019 — 2022
Nicholas Greenspan, Undergraduate, Computer Science	2021
Sian Lee Kitt, Undergraduate, Computer Science	2020
John Luoyu Zhou, Undergraduate, Computer Science	2020
Ryan Glassman, Undergraduate, Computer Science	2020
Luhuan Wu, MS, Statistics	2019

PREVIOUS RESEARCH EXPERIENCE

Research Assistant, Laboratory of Matthias Bethge <i>University of Tübingen, Tübingen, Germany</i>	Jun 2017 — Aug 2017
Independent Study, Laboratory of Gabriel Kreiman <i>Harvard Medical School, Boston, MA</i>	Feb 2017 — May 2017
Research Assistant, Laboratory of Naoshige Uchida <i>Harvard University, Cambridge, MA</i>	Feb 2016 — May 2017
Research Assistant, Laboratory of Florian Engert <i>Harvard University, Cambridge, MA</i>	Sep 2015 — Feb 2016
Research Assistant, Laboratory of Daniel Schacter <i>Harvard University, Cambridge, MA</i>	Sep 2014 — Dec 2014
Research Assistant, Laboratory of Martin Rohrmeier <i>Massachusetts Institute of Technology, Cambridge, MA</i>	Jul 2014 — Aug 2014