

# ALEX NGUYEN

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## EDUCATION

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- Princeton Neuroscience Institute, Princeton, NJ** 09/2020 - Present  
PhD in Neuroscience
- Minerva Schools at KGI, San Francisco, CA** 09/2015 - 05/2019  
B.Sc. in Natural Sciences and Computational Sciences  
Concentrating in Biophysics and Computational Statistics

## RESEARCH EXPERIENCE

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- Princeton Neuroscience Institute, Princeton University** 09/2019 - 08/2020  
*Research Specialist*
  - Build neural network models of representational changes during statistical learning
  - Use Go and the Emergent framework to build models and Python to analyze results
- University of British Columbia Department of Chemistry** 09/2018 - 09/2019  
*Research Assistant*
  - Develop algorithms to efficiently solve quantum chemistry problems
  - Solve Schrodinger's Equations efficiently using a modified Green's function method
- Stanford University School of Engineering** 06/2018 - 08/2018  
*Research Intern*
  - Build a Node.js app that quantifies team dynamics and improves team effectiveness
  - Implement natural language processing and sentiment analysis techniques in Python scikit-learn to measure team dynamics and identify effective interventions
- Audible, Inc.** 08/2016 - 08/2017  
*Research Intern*
  - Develop a listening comprehension program using psychological principles from the science of learning
  - Utilize quantitative research methods and implement a controlled experiment to test the effectiveness of the program
- Stanford Artificial Intelligence Laboratory** 05/2016 - 08/2016  
*Research Assistant*
  - Implement a genetic algorithm in Python to reconstruct subjects' mental template of visual scenes

## TEACHING EXPERIENCE

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- Computational Neuroscience, Princeton University** 01/2022 - 05/2022  
*Graduate Assistant Instructor*
- Mathematical Tools for Neuroscience, Princeton University** 09/2021 - 12/2021  
*Graduate Assistant Instructor*

## LEADERSHIP AND AWARDS

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- Canada Governor General’s Academic Medal (2015)
- Britannia Gold Scholarship for Highest Achieving Scholar (2015)
- Ryerson University Undergraduate Summer Research Grant (2016)
- Canada National Science and Engineering Research Council Undergraduate Summer Research Awards (2017, 2018)
- Princeton Neuroscience Institute Recruitment Week Student Organizer (2022)
- Manhattan Area Memory Meeting Trainee Organizer (2022)

## PUBLICATIONS

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- **Alex Nguyen**, Gautam Reddy (2024). “Differential learning kinetics govern the transition from memorization to generalization during in-context learning.” arXiv preprint *arXiv:2412.00104*.
- **Alex Nguyen**, David J. Schwab, Vudtiwat Ngampruetikorn (2024). “Generalization vs. Specialization under Concept Shift.” Scientific Methods for Understanding Deep Learning. Workshop at the Conference on Neural Information Processing Systems (NeurIPS).
- Victoria J.H. Ritvo, **Alex Nguyen**, Nicholas Turk-Browne, Kenneth A. Norman (2023). “Differentiation and Integration of Competing Memories: A Neural Network Model.” eLife (Accepted as a Reviewed Preprint).
- Kailong Peng, Jeff Wammes, **Alex Nguyen**, Coraline R. Iordan, Kenneth A. Norman, Nicholas Turk-Browne (2024). Inducing representational change in the hippocampus through real-time neurofeedback. Philosophical Transactions B.
- Paul Scotti, Atmatdeep Banerjee, Jimmie Goode, Stepan Shabalin, **Alex Nguyen**, Ethan Cohen, Tanishq Mathew Abraham. (2023). Reconstructing the Mind’s Eye: fMRI-to-Image with Contrastive Learning and Diffusion Priors. Advances in Neural Information Processing Systems (2023).
- **Alex Nguyen**, Kiel Howe (2019). “Learning Renormalization with a Convolutional Neural Network.” Machine Learning and the Physical Sciences. Workshop at the 33rd Conference on Neural Information Processing Systems (NeurIPS).

## CONFERENCE PRESENTATIONS

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- Victoria J.H. Ritvo, **Alex Nguyen**, Nicholas Turk-Browne, Kenneth A. Norman (2022). “Differentiation and Integration of Competing Memories: A Neural Network Model.” Poster presented at the 18th Annual Context and Episodic Memory Symposium, Philadelphia, PA.