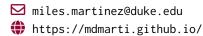
Miles Martinez







Education

2020 – 2026 Ph.D. Electrical and Computer Engineering

Thesis advisor: Professor John Pearson

- M.Sc. Electrical & Computer Engineering, Duke University
- Certificate in Cognitive Neuroscience
- Certificate in College Teaching

2016-2020 Sc.B. Cognitive Neuroscience

Thesis advisor: Professor Joo-Hyun Song

Thesis title: The Effects of Observation on Visuomotor Adaptation

Honors, Awards, & Fellowships

May 2024 Outstanding Graduate Teaching Assistant, Probabilistic Machine Learning

June 2023 Ruth L. Kirschstein Predoctoral Individual National Research Service Award (F31)

May 2020 Muriel Fain Sher Premium in Psychology

May 2020,2019 Research at Brown Award

August 2019 NINDS Exceptional Student Award

Publications

J. Qi, D. C. Schreiner, **M. Martinez**, J. Pearson, and R. Mooney, "Dual neuromodulatory dynamics underlie birdsong learning," *Nature*, vol. 641, pp. 690–698, 2025.

L. M. Koponen, **M. Martinez**, E. Wood, *et al.*, "Transcranial magnetic stimulation input-output curve slope differences suggest variation in recruitment across muscle representations in primary motor cortex," *Frontiers in Human Neuroscience*, vol. 18, 2024.

T. S. L. Wang, **M. Martinez**, E. K. Festa, W. C. Heindel, and J. H. Song, "Age-related enhancement in visuomotor learning by a dual-task," *Scientific Reports*, vol. 12, 1 2022.

M. Martinez and J. Pearson, "Reproducible, incremental representation learning with the rosetta vae," in *Bayesian Deep Learning Workshop, NeurIPS 2021*, 2021.

Under Review/In Prep

M. Martinez and J. Pearson, "Flexible modeling of animal vocal communication," [in prep].

M. Martinez and A. H. Williams, "Quasi-monte carlo methods enable extremely low-dimensional deep generative models," [under review].

Posters and Presentations

- **M. Martinez** and J. Pearson, "Inferring structure in acoustic variability," in *Duke Department of Neurobiology Research in Progress Seminar Series*, [talk], 2025.
- **M. Martinez**, J. Qi, R. Mooney, and J. Pearson, "Song variability coding in the zebra finch basal ganglia," in *Neural Mechanisms of Acoustic Communication GRC*, [poster], 2024.
- **M. Martinez**, S. Brudner, R. Mooney, and J. Pearson, "Moduling tutor-directed dynamics in zebra finch song learning," in CoSyNe, [poster], 2022.
- **M. Martinez**, J. Qi, R. Mooney, and J. Pearson, "Data-driven exploration of natural song learning in the juvenile zebra finch," in *Neural Mechanisms of Acoustic Communication GRC*, [poster], 2022.
- **M. Martinez**, I. Osuarah, D. S. Reich, I. S. M. Cortese, and G. Nair, "Atlas-free brain segmentation by Classification using DErivative-based Features (C-DEF) in profressive multifocal leukoencephalopathy," in *NINDS Awards Ceremony*, [talk,poster], 2019.
- **M. Martinez**, M. Broderick, A. Anderson, and E. Lalor, "Recent and distant semantic information make distinct contributions to processing of natural, ongoing speech," in *University of Rochester Center for Visual Science Research Symposium*, [poster], 2018.

Teaching

CNRI: Python and Concepts (Fall 2021 – Spring 2025)

- Designed Python for Psychology class aimed at students with no prior research or programming experience
- Co-taught weekly Python lectures, advised students on experiment programming projects
- Taught systems neuroscience conceptual lectures aimed at exposing students to research in songbirds

DIBS Methods Meetings (Spring 2021 – Spring 2024)

- Taught workshops for Duke's Intitute of Brain Sciences on machine learning and statistical analyses, aimed at exposing cognitive neuroscientists to analysis techniques
- Organized and coordinated speakers and funding (Fall 2023)

Probabilistic Machine Learning (Spring 2024)

- Taught weekly workshop on topics covered in lecture, designed multiple workshops
- Organized and coordinated 7 graduate TAs in homework grading, office hours, and problem set support
- Awarded ECE Department Outstanding Graduate TA award

Vector Space Methods with Applications (Fall 2022)

- Coordinated weekly office hours, graded homeworks and tests
- Designed problem set around developing intuition for optimization through alternating projections

Mentoring

Pearson Lab (Fall 2024 -)

- Managed two undergraduate students in analyzing complex neural and behavioral data
- Taught big data management and statistical analyses in multiple programming languages

Cognitive Neuroscience Research Internship: Mentoring (Spring 2022 – Spring 2025)

- Mentored 8 undergraduate students with no prior research experience
- Introduced basic concepts in systems neuroscience, statistics, and data science

Skills

Coding languages

Python, PyTorch, Jax, R, MATLAB,C++

Coding skills

Generative modeling, image processing, audio analysis, representation learning, big data, high-dimensional datasets, data visualization