School Address:
233 Massachusetts Ave
Cambridge, MA 02139

Quilee Simeon

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Home Address:
29 Garrison Ave
Somerville, MA 02144

EDUCATION:

Massachusetts Institute of Technology (MIT) — Cambridge, MA

Ph.D. Candidate (Year 3), Interdisciplinary PhD in BCS and Statistics, Department of Brain and Cognitive Sciences (BCS) & Institute for Data, Systems and Society (IDSS), GPA: 4.8/5.0 — Sept 2021 — present

Expected Degree Date: June, 2026

B.S. in Computation and Cognition, Minor in Statistics and Data Science, GPA: 4.9/5.0 — Cambridge, MA, Sept 2017 — June 2021

Degree Date: June 6, 2021

Relevant Coursework: Artificial Intelligence (AI) & Machine Learning (ML), Statistics & Data Science, Probability Theory, Discrete & Applied Mathematics, Computer Vision, Computational Neuroscience, Therapeutics Design, Developmental Biology, Molecular & Cellular Neuroscience.

RESEARCH EXPERIENCE:

Kavli Institute for Theoretical Physics — Santa Barbara, CA

Neurophysics of Locomotion Student (Investigators: Dr. Bradley Dickersons & Dr. Jessica Fox) — July — August 2022

- Performed experiments to elucidate how volitional control of the motion and trajectory of *Drosophila* halteres controls fly-flight. Built rigs for fly-tethering, optogenetics, and high-speed video capture. Performed image tracking and analysis on recorded multi-modal experimental datasets.

McGovern Institute for Brain Research — Cambridge, MA

Graduate Researcher & PhD Candidate (Principal Investigator: Dr. Guangyu Yang) — Sept 2021 — present

- Developed recurrent neural network (RNN) and reinforcement learning (RL) models of cognitive neuroscience tasks performed by humans and non-human primates. Evaluated and optimized the performance of these networks against the behavioral performance of humans and NHPs.
- Utilized the animal model of *C. elegans* to study neural dynamics, combining neural networks, calcium imaging, and constraints of the biological nervous system. Employed self-supervised ML to predict neural activity and behavior, advancing neuroscience perspectives.

Undergraduate Researcher (Principal Investigator: Dr. Ann Graybiel) — Cambridge, MA, June 2018 — Dec 2020

- Worked on systems neuroscience experiments studying Huntington's disease and SHANK-protein mediated Autism Spectrum Disorder (ASD) using mouse models. Fabricated hybrid electrophysiological apparatus and interfaces for measuring and perturbing neural activity as mice performed cognitive assays. Wrote image analysis code for analyzing neuron cytoarchitecture in histological sections. Built a semi-automated pipeline making use of modern computer vision and ML techniques to analyze stereotyped and repetitive behaviors in mice.

WORK EXPERIENCE:

Triplet Therapeutics — Cambridge, MA

Bioinformatics & Software Development Intern — July — September 2019, January — March 2021

- Created and later refined a ML model for short interfering RNA (siRNA) and antisense oligonucleotide (ASO) efficacy prediction and enhanced the automated drug design pipeline. Crafted web and CLI tools for small-molecule drug guidance, incorporating patented oligo-templates. Deployed a neural network to predict gene knockdown efficacy of siRNA/ASO, targeting rare neurological disorders.

MIT International Science and Technology Initiatives (MISTI) — remote

MIT-Brazil Remote ELO Intern, Project Assistant & Student Ambassador — June — August 2020

- Collaborated with scientists at the Hospital Israelita Albert Einstein on a biomedical imaging project, predicting leukemia cell migration post-chemotherapy. Expanded MIT student opportunities in Brazil, merging natural sciences with engineering. Ideated biotech solutions for pressing agriculture and medical challenges in Latin America.

TEACHING EXPERIENCE:

MIT Global Teaching Labs (GTL)

Instructor - Wales — Cardiff, Wales, January 2020

- Designed and presented multidisciplinary courses reflective of the type of critical thinking and problem solving skills required of a lifelong learner:
    1. SSH and Data Processing : how to set up, gather and process experimental data remotely;
    2. Coding Complexity and Chaos : combining computer science, art and mathematics;
    3. Neurotechnology : seminar on technology at the intersection of computation and cognition.

Instructor - South Africa — Johannesburg, ZAF, January 2019

- Taught intro level courses in computer science, neuroscience and neurotechnology to high school students from across countries in southern Africa as part of an independently developed curriculum for the first ever GTL program on the African continent.

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Teaching Assistant
Principles of Neural Computations in Brains and Machines — Cambridge, MA, Sept 2023 — present
- Hosted office hours and tutorials on topics including neural representation, dynamics, and key principles of neural computation in both biological and artificial networks.

Emergent Computations in Distributed Neural Circuits — Cambridge, MA, February — May 2023
- Prepared and taught tutorials in linear algebra, computing, dynamical systems, and neural networks.

Tutor and Lab Assistant
Fundamentals of Programming — Cambridge, MA, Sept 2018 — Dec 2019
- Participated in weekly meetings plan course content and code labs from scratch. Revised coursework on image processing, recursion, dynamic programming and data structures. Provided students with technical and conceptual help during virtual and in-person office-hours.

Introduction to Neural Computation — Cambridge, MA, February — May 2019
- Hosted weekend tutoring sessions to review topics like mathematics of neurons, neural nets, statistical inference, and data analysis in neuroscience.

VOLUNTEERING & D.E.I.J.:
MIT Black Student Union (BSU)
Social Chair — Cambridge, MA, Sept 2020 — Feb 2021
- Collaborated to organize social events celebrating the black/African-American MIT community. Point-of-contact for guest speakers and performance groups at BSU social events. Maintained mailing lists and informed members of upcoming events.

ADDITIONAL EDUCATION & CERTIFICATIONS:
Analytical Connectionism (AC) — London, United Kingdom, September 2023
- Studied neural-network analysis methods and connectionist theories; worked on a group project involving manifold analysis in RNNs.

Methods in Computational Neuroscience (MCN) — Woods Hole, MA, July — August 2023
- Grasped computational techniques for brain functions and undertook a project on neural representations in recurrent neural networks.

Topics in Modern Machine Learning (ModML) — Genoa, Italy, June 2023
- Gained insights into advanced ML topics and participated in hands-on sessions and expert-led workshops.

Machine Learning Crash Course (MLCC) — Genoa, Italy, June 2022
- Delved into core ML methods and techniques, complemented by practical lab exercises.

Neuromatch Academy Computational Neuroscience (NMA-CN) — remote, July 2022
- Explored computational neuroscience, modeling, and Python coding; focused on ML, dynamical systems, and causality.

LEADERSHIP:
IEEE-HKN Beta Theta Chapter — Cambridge, MA
President — Aug 2021 — Dec 2022

Caribbean Science Foundation
SPISE 2020 Computer Programming Instructor — remote, June — August 2021
- Developed Caribbean students' understanding of concepts and fundamental principles in computer programming, so that they gain enough mastery to apply to solve problems requiring critical thinking. Acted as a mentor and role model for the students and provided guidance and advice on university and the possible challenges the may encounter in academic and professional life. Taught students the importance of teamwork, efficient study habits, and time-management skills.

SKILLS:
Computer: Programming: Python, Julia, MATLAB, HTML, PHP, SQL, C, R;
ML, bioinformatics, statistics, data analysis, spreadsheets
Professional: project management, public speaking, leadership

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HONORS SOCIETIES:
- Beta Theta chapter (MIT) of IEEE Eta Kappa Nu (IEEE-HKN)
- Oxford Rhodes Finalist for the Commonwealth Caribbean