Grayson Martin

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Education

Harvard University Cambridge, MA

Bachelor of Arts in Computer Science, Minor in Mathematical Sciences *Sep. 2021 – May 2025*

- Graduate-level coursework in computer vision, geometric machine learning, and high-performance computing for science and engineering

Research Interests

Embodied Intelligence and Robot Learning

World Models and Planning

Spatial Intelligence and Representation Learning

Memory and Lifelong Learning

Research Experience

ML Research Engineering Fellow Sep. 2025 – Present

The Kempner Institute at Harvard University *Boston, MA*

- Supporting an institute project to build biologically-constrained computational models of the mouse brain
- Developed a reproducible and highly configurable set of randomly generated simulation environments that allow research questions to be answered quickly e.g. *Does the agent's visual-spatial mapping generalize across lighting conditions?*
- Investigating the capabilities and limitations of reinforcement learning-based action selection using representations from a biologically plausible cortico-hippocampal circuit
- Investigating whether confidence in a biologically inspired visual-spatial mapping circuit can guide exploration through intrinsic motivation
- Core contributor to a NeuroAI research platform supporting composable neural circuits with heterogeneous learning rules

Robotics and Automation Rapid Prototype Intern May 2024 – Aug. 2024

Los Alamos National Laboratory *Los Alamos, NM*

- Collaboratively designed, built, and programmed a robotic system for autonomous assembly and disassembly of DPP-3 shipping containers for radioactive material
- Led the computer vision aspect of the project, fine-tuning pre-trained neural networks to recognize bolts and report their location in the camera frame
- Presented design in a conference publication and talk at Waste Management Symposium 2025

Student Mentoring and Research Training Intern May 2023 – Aug 2023

The University of Tennessee Oak Ridge Innovation Institute *Knoxville, TN*

- Studied the tradeoff between computational cost and generated path quality across two models of quadrotor dynamics in MATLAB simulations with the GPOPS-II optimizer
- Found the simpler model used less compute and generated more optimal paths, but noted that imprecision in the physical model of the quadrotor must be addressed before a final determination can be made
- Presented findings with a poster and talk at an end-of-program symposium

Publications

Olyvia Hanken-Arlen, **Grayson Martin**, Anunth Ramaswami, Jessica Mendez, Colin Sanders, Matthew Hammond, and Beth Boardman. "A Mobile, Autonomous Bolting and Unbolting System for DOE Shipping Containers." *Waste Management Symposia*, Phoenix, AZ (2025).
Superior Level Rating (awarded to 93 of 530+ papers)

Eleanor Batty, **Grayson M. Martin**, Noah L. Petit, Livia C. Murray, Da Liu, Malcolm R. Grant, Houman Safaai, Naeem Khoshnevis, and Bernardo Sabatini. "A cortico-hippocampal circuit for visual spatial mapping and one-shot goal-directed navigation."
Abstract under review at COSYNE 2027

Teaching Experience

Teaching Fellow Spring 2026
Harvard University School of Engineering and Applied Sciences *Boston, MA*

CS 2050: High Performance Computing for Science and Engineering

- Held office hours and graded assignments related to parallel computing (OpenMP), distributed computing (MPI), and GPU computing (CUDA)

Teaching Assistant Summer 2022
Upward Bound at Southwest Virginia Community College *Cedar Bluff, VA*

- Supported instruction in robotics, world geography, and student success
- Encouraged underserved, first-generation students to pursue higher education through presentations on holistic college admissions, financial aid, and educational opportunities

Other Experience

Co-Founder May 2020 – Present
Medentum Innovations, Inc. *Clintwood, VA*

- Co-invented a patented telemedicine device, progressing from Raspberry Pi-controlled, 3D-printed prototypes to coordination with manufacturing vendors for a minimum viable product
- Served as the primary liaison for an external data scientist on an NIH-backed COPD flare-up prediction project, advise an internal data scientist on various projects
- Review and edit grant proposals for clarity and technical accuracy

Director of Data Journalism January 2024 – December 2024
The Harvard Crimson *Cambridge, MA*

- Elected to lead a small team of data scientists helping all sectors of The Crimson generate content that requires data acquisition and analysis

Other Publications

Elyse C. Goncalves, Matan H. Josephy, and **Grayson M. Martin**. "Most Schools Dream of Sending Students to Harvard. These 21 Expect To." *The Harvard Crimson*, Nov 14, 2024. link
2024 Society of Professional Journalists Mark of Excellence Awards Finalist, New England Region

Selected Projects

Curriculum Reinforcement Learning for Quadruped Jumping

- Extended an existing PyTorch-based quadruped locomotion project in NVIDIA IsaacSim by introducing flying obstacles and using reward-shaping to teach the quadruped to jump over them
- Designed a two-stage curriculum: stage I focused on achieving ideal jumping motion, while stage II integrated dynamic obstacles

Speedrunning the Boston MBTA

- Formulated a relaxed traveling salesman problem using public transit travel times and pedestrian connections to minimize the time required to visit all 125 MBTA rail stations
- Completed the route in 8 hours and 31 minutes and coauthored an interactive article documenting the methodology and expedition link

Patents

Nicholas Cox, **Grayson Martin**, Christopher Owens, David Owens, Starla Kiser, Nicolle Corner, Vivek Ranjit Shinde Patil."Diagnostic Device for Remote Consultations and Telemedicine." **US Patent 12183457**, Dec 31, 2024.

Technical Skills

Languages: Python, C++, MATLAB, LabVIEW
Machine Learning: PyTorch, TensorFlow, Reinforcement Learning, Computer Vision
High Performance Computing: OpenMP, MPI, Slurm
Developer Tools: Git, CI/CD, Agentic Coding