MORGAN N. McCARTY

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EDUCATION

Northeastern University, Boston, MA   September 2020 - May 2025
Khoury College of Computer Sciences
Bachelors of Science in Computer Science, minors in Cell and Molecular Biology, Mathematics
- Courses include: Artificial Intelligence, Machine Learning and Data Mining 2, Number Theory, Algorithms and Data, Calculus 3, Cognition, Advanced Genomics, Neurobiology, Systems Security

Boston Latin School, Boston, MA   September 2014 - June 2020
High School Diploma
- Senior research project: *Analysis of Genetic Algorithms for their Potential to Optimize Code*

RELEVANT EXPERIENCE

Northeastern University, Boston, MA
- *Research Assistant (Artificial Intelligence Algorithms) - **Subjectivity Lab***   September 2024 - Present
  - Applied for and received funding grant through Northeastern University PEAK totalling $3,000
  - Implemented project targeting imagery capabilities within Large-Language Models against human baseline
  - Probed models to understand success and failure of tasks from a low (mathematical) and high (psychological) level perspective
- *Co-op Research Assistant (Psychology and Virtual Reality) - **Subjectivity Lab***   January 2023 - June 2023
  - Constructed library for integrating Virtual Reality with Psychology experiment library Psychopy
  - Utilized library to create several experiments designed to work in a VR headset
  - Created tools to help with diagnosis of disorders of consciousness (working with Mass General)
- *Teaching Assistant for Artificial Intelligence (CS 4100)*   September 2022 - December 2022
  - Improved students understanding of content through one-on-one meetings
  - Graded and provided relevant feedback on assignments, examinations, and projects
- *Co-op Research Assistant (Autonomous Driving) - **CPI at Northeastern***   January 2022 - August 2022
  - Developed a new framework to allow more realistic testing of OpenPilot in simulation (Carla)
  - Designed virtualization of real-life components to improve simulated cars
  - Analyzed the framework and structure of OpenPilot's code: looking for issues and potential exploits

Harvard Medical School, Boston, MA
- *Co-op Research Assistant (Neural Networks) - **Sabatini Lab***   January 2024 - June 2024
  - Wrote neural network implementation of mouse neurobiology task using vanilla RNNs in PyTorch
  - Trained models on multiple tasks (tone discrimination, two-armed bandit) to improve understanding of real-world learning in mice

PRESENTATIONS AND PUBLICATIONS

McCarty, M. & Morales, J. (2025). Artificial Phantasia: What the Virtual Mind Cannot Imagine. *RISE at Northeastern 2025*.

McPhee, M., **McCarty, M.**, Young, M., & Morales, J. (2024). The pupil and the mind's eye: Portable pupillometry captures robust responses to imaginary light. *Journal of Vision*, *24*(10), 1499-1499.

Zhou, X., Chen, A., Kouzel, M., Ren, H., **McCarty, M.**, Nita-Rotaru, C., & Alemzadeh, H. (2024). Runtime Stealthy Perception Attacks against DNN-based Adaptive Cruise Control Systems. *arXiv preprint arXiv:2307.08939. (Accepted at ACM ASIACCS 2025)*

TECHNICAL SKILLS

Machine Learning, Artificial Intelligence, and Data Science Skills
- Mathematical and practical implementations of classic and state-of-the-art algorithms (including the Transformer), NumPy, Pandas, Scikit-Learn, Torch, Tensorflow, PyMC, Amazon EC2, MongoDB

Operating Systems
- Linux (Arch, Ubuntu), MacOS, Windows

Programming Languages
- *Proficient:* Java, Python, R, C, CISC Assembly; *Experience*: RISC Assembly, C++, C#, JavaScript