

Rodney Lafuente-Mercado

Cambridge, MA rodneyslafuente@gmail.com (605) 202-0853 rlafuente.com

EXPERIENCE

MIT Lincoln Laboratory

Associate Staff

Assistant Staff

Cambridge, MA

Aug 2025 – Present

Jun 2023 – Jul 2025

- In Group 01 (AI Technology), build and deploy **RL aircraft autonomy models** on distributed computing infrastructure, supporting both large-scale simulations and live aerial combat.
- Co-developed a **reinforcement learning environment manager** for **100+ node SLURM clusters**, enabling efficient adversarial training and reproducible experiments at scale; published in **IEEE HPEC**.
- Led contributions to the **DARPA ACE program**, where RL agents demonstrated flight robustness under degraded sensing conditions; software piloted the **Secretary of the Air Force's aircraft**.
- Advancing autonomy under the **DARPA AIR program**, developing beyond-visual-range engagement strategies on F-16 testbeds as a precursor to unmanned combat applications.
- Preparing for involvement in **DARPA VENOM**, converting modified F-16s into autonomy testbeds with mission systems, instrumentation, and hardware/software-in-the-loop testing.

REI Systems

Machine Learning Engineer

Sterling, VA

Apr 2023 – Jun 2023

- Built a **patent search engine** for the USPTO with scalable ranking of text and image data.
- Engineered a **CUDA C++ radix sort** achieving **1000x faster** binary vector ranking vs. ElasticSearch.

Harvard Medical School

Machine Learning Researcher

Boston, MA

Dec 2021 – May 2022

- Developed a pipeline to analyze SARS-CoV-2 nucleocapsid images using ML and image processing.
- Trained lab staff to run the pipeline, enabling adoption by non-technical researchers.

Amazon Web Services

Software Engineer Intern

Seattle, WA

Jun 2021 – Aug 2021

- Implemented structural changes to the **AWS Signer API** for fine-grained signing configurations.
- Integrated changes into production and gained proficiency with the **AWS CDK**.

EDUCATION

University of Texas, Austin

Master of Science in Computer Science

Austin, TX

Part-time, expected September 2027

Harvard University

Bachelor of Arts in Applied Mathematics

Cambridge, MA

December 2022

PUBLICATIONS

- **Rodney Lafuente-Mercado. Adaptive Policy Synchronization for Scalable Reinforcement Learning. IEEE HPEC, 2025.** <https://arxiv.org/abs/2507.10990>
- William Li, **Rodney Lafuente-Mercado**, Jaime D. Peña, Ross E. Allen. **Syndeo: Portable Ray Clusters with Secure Containerization. IEEE HPEC, 2024.** <https://arxiv.org/abs/2409.17070>

SKILLS

- **Programming Languages:** Python, JavaScript/TypeScript, Java, x86/C/C++, C++ CUDA, Julia
- **ML Frameworks:** PyTorch, Jax, Scikit-Learn, TensorFlow, Keras
- **Frameworks:** Django, NodeJS, ReactJS/React Native, AWS CDK
- **Language:** Fluent Spanish Speaker (written/verbal), \LaTeX