

# Rodney S. Lafuente Mercado

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## EDUCATION

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### Harvard University

*Bachelor of Arts with Honors in Applied Mathematics (GPA: 3.61/4.00)*

*December 2022*

*Cambridge, MA*

## EXPERIENCE

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### Massachusetts Institute of Technology, Lincoln Laboratory

*Assistant Member of Technical Staff*

*June 2023 – Present*

*Cambridge, MA*

- Co-led the development of software that enabled Kubernetes-like management of **Reinforcement Learning environments on a 100+ node SLURM cluster**, for use in adversarial training.
- Spearheaded a program that resulted in successful testing of RL agents in a **DARPA-funded effort**, demonstrating autonomous aircraft flying with **robustness under perturbed information**.
- Pioneered the application of novel **differential game theoretic approaches** to **aerial combat**, crafting software that provided an analytic alternative to deep learning, using optimized Julia.
- Developed a platform named Syndeo that enables easy, secure, and scalable training of reinforcement learning models across large compute clusters, culminating in a **publication**.

### REI Systems

*Associate Data Engineer*

*April 2023 - June 2023*

*Sterling, VA*

- Architected a search engine for ranking text and image information from patents for the **USPTO**.
- Engineered a **custom CUDA C++ implementation of Radix Sort** to rank binary vectors **over 1000x faster** than existing technology like AWS Elasticsearch and Pinecone.

### Harvard Medical School

*Machine Learning Researcher*

*December 2021 - May 2022*

*Boston, MA*

- In Prof. Pamela Silver's lab, developed and maintained a pipeline for analyzing SARS-CoV-2 nucleocapsid images using machine learning techniques including **Random Forest Classifiers and Support Vector Machines**. Optimized performance of the stack on **HMS's O2 Cluster**.
- Tackled the challenge of scaling these algorithms to handle large datasets. Achieved results on par with **commercial data labeling and image analysis software** used in lab.
- Led **instructive meetings** to teach non-technical lab staff the fundamentals of software and machine learning. Assisted staff in using the pipeline to analyze data collected from cell wells.

### Amazon.com Inc., Amazon Web Services

*Software Development Engineer Intern*

*June 2021 - August 2021*

*Seattle, WA*

- Learned and applied principles of cloud computing within the **AWS Cryptography Organization**.
- Designed and implemented structural changes to the **AWS Signer API**, Amazon's code signing service, to enable customers to express signing configurations of higher granularity.
- Gained practical experience in working with large-scale software systems and translating technical ideas into **immediate economic impact**. Became proficient in **AWS CDK**.

## SKILLS & TECHNIQUES

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- **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)