Jon Rosario

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Education

Massachusetts Institute of Technology (MIT) Expected graduation date: May 2024

B.S. in Mathematics, B.S. in Computer Science and Engineering | Link to all courses ***GPA: 4.8/5.0***

Relevant Courses: Software Construction, Software Performance Engineering[S], Design & Analysis of Algorithms, Theory of Computation[GT], Machine Learning[T], Linear Algebra & Optimization[T], Quantum Computation[G], Discrete Math

G = Graduate Level Course, **T** = Tutor, Lab Assistant, or Grader, **S** = Special/Advanced Subject

Experience

Amazon Summer 2023

Software Development Engineer Intern *Java, Python, TypeScript, AWS, Git*

- Developed the next version of the widely-used internal solution for fine-grained ML workflow orchestration.
- Implemented a dynamic custom scheduler, enabling task distribution among multiple worker groups with efficient management and scaling through a bin-packing algorithm. This innovation is projected to yield annual cost savings of approximately $0.5 million or a 25% reduction in compute expenses.
- Surpassed project expectations by revamping internal infrastructure, expanding the range of compatible worker types.
- Received a 'Strongly Inclined' rating, indicating highest approval for my return. Unfortunately, a position could not be offered due to headcount constraints.

NASA JPL Summer 2022

Intern *Python, Machine Learning, Git, C/C++*

- Designed Python programs to carry out end-to-end assessment of radiometric terrain-corrected SAR products, using state-of-the-art C/C++ software to process spaceborne/ airborne InSAR (Mentor: Gustavo H. X. Shiroma)
- Worked on the open-source library InSAR Scientific Computing Environment ISCE3 currently being built by NASA JPL engineers in C++ and corresponding Python wrapper *COMPASS*.
- Analysis was published and presented at the International Geoscience and Remote Sensing Symposium 2023.

MIT Directed Reading Program Winter 2023

Participant

- Collaborated with another undergraduate in learning about classical and quantum probabilistically checkable proofs, and met with a graduate mathematics student to present the material multiple times per week.
- Program concluded with a presentation given at the DRP project symposium, with slides available at triviajon.com.

MIT Machine Learning Course Spring 2022

Laboratory Assistant *Python, Machine Learning, Git, Teaching*

- Guided students in learning the fundamentals and more advanced concepts of machine learning, including Regression/Classification, Markov Decision Processes, and Neural Networks.

MIT Glaciers Group Summer 2021

Undergraduate Researcher *Python, Google Cloud, JavaScript, Machine Learning, Git*

- Researched and presented methods for analyzing glaciers in Antarctica and created software in Python/Javascript to efficiently pre-process radar files greater than 100GB for use in machine learning (Mentor: Brian Riel).
- Utilized Google Cloud tools, Python, and JavaScript for computer vision and pattern recognition. Successfully implemented two image speckle filtering methods: Frost filter and Gamma MAP filter, following Lopes et al. 1990.

Projects

- Implemented a CW-randomness extractor in C and Python based on Carter and Wegman's construction to partially derandomize the Polynomial Identity Testing (PIT) problem, showcasing theoretical interest in randomness extraction.
- Implemented a multithreaded AI for a Chess-like game in C featuring LazySMP, bitboards, and an opening book.
- Designed and implemented ODE/PDE computational models using the finite element method from scratch in Python.
- Programmed a bot managing its own database of images and a custom hashing solution for quick image comparison.
- Developed a file monitoring utility in C, providing time-derivatives of file size with optional real-time updates.
- Created the first solution set available on programming exercises from Abstract Algebra: Theory and Applications.

Skills and Technologies

Languages: Python, TypeScript, JavaScript, C/C++, Java, Julia Lang, Bash, HTML, CSS

Technologies & Tools: Git, Linux, Docker, AWS, Google Cloud, PyTorch, CI/CD, IaC