Jon Rosario

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Education

- Massachusetts Institute of Technology (MIT) | **Class** of 2024 | **GPA**: 4.8/5.0
- Candidate for B.S. in **Mathematics** and B.S. in **Computer Science and Engineering**
- **Relevant Coursework**: Software Construction, Theory of Computation[GST], Software Performance Engineering[S], Linear Algebra & Optimization[T], Machine Learning[T], Quantum Computation[G], Matrix Calculus[S], Design & Analysis of Algorithms, Abstract Algebra[S], Real Analysis[S], Differential Equations, Seminars in Discrete Mathematics and Information Theory

G = Course taught at Graduate Level | **T =** Tutor, Laboratory Assistant, or Grader | **S =** Special or Advanced Subject

Skills

- Java
- Python
- Julia Lang
- AWS Services
- C and C++
- Git
- TypeScript + JS
- Machine Learning

Leadership & Experience

Software Development Engineer | Amazon | Intern | Summer 2023

- 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 critical infrastructure, expanding the range of compatible worker types

Directed Reading Program | MIT | Participant | Winter 2023

- Collaborated with another undergraduate in learning about classical and quantum probabilistically checkable proofs, and met with 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**

NASA Summer Internship Program | NASA JPL | Intern | Summer 2022

- 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)
- Reviewed and debugged 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.

Machine Learning Course | MIT | Laboratory Assistant | Spring 2022

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

Undergraduate Research with Glaciers Group | MIT | Researcher | Summer 2021

- 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

- **Programming Solution Guide for Abstract Algebra**
  - Created the first solution guide available online on programming exercises from Abstract Algebra: Theory and Applications, including algorithms for fast multiplication and integer partitions with dynamic programming in Python.
- **Other Projects** (some available at **https://github.com/triviajon/**)
  - 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 the file size and time-derivatives with optional real-time updates.