Jon Rosario

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Education

- Massachusetts Institute of Technology (MIT) | **Class of** 2024 | **GPA**: 4.7/5.0
- Candidate for B.S. in **Mathematics** and B.S. in **Computer Science and Engineering**
- **Relevant Coursework**: Quantum Computation[G], Quantum Physics, Linear Algebra & Optimization[T], Matrix Calculus[S], Design and Analysis of Algorithms, Theory of Computation[GS], Abstract Algebra[S], Real Analysis[S], Differential Equations

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

Skills

- Python
- Julia
- Git/GitHub
- Computer Aided Design
- C/C++
- HTML/CSS/JS

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
- Discord Bot
  - Programmed a bot using the Discord API that can scan and detect similarity in images and text inputs
- Other Projects
  - Designed and implemented ODE/PDE computational models using the finite element method from scratch in Python
  - Exploratory project on hash functions appearing in non-cryptographic settings
  - Other projects available on GitHub: **https://github.com/triviajon/**

Leadership & Experience

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 and programmed programs in Python to carry out end-to-end assessment of radiometric terrain-corrected SAR products, which use state-of-the-art C/C++ software to process spaceborne and airborne InSAR (Mentor: Gustavo H. X. Shiroma)
- Reviewed and successfully debugged the open-source library InSAR Scientific Computing Environment ISCE3 currently being built by NASA JPL engineers in C++ and corresponding Python wrapper COMPASS
- In the process of writing a communications letter detailing the analysis and trends found as the main author, and potentially co-authoring a journal paper, both intended to be peer-reviewed and published

Machine Learning Course | MIT | Laboratory Assistant | Spring 2022

- Guided students in learning the fundamentals and more advanced concepts of machine leaning, 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)
- Included use of Google Cloud and the Google Cloud Developer Console, Python and JavaScript, and the Google Earth Engine API. Worked in computer vision and pattern recognition. Successfully manually implemented two methods of image speckle filtering: the Frost filter and the Gamma MAP filter as described in Lopes, et al. 1990.

MIT Council for Math Majors (CoMM) | MIT | Council Member | Current

- Advocating for prospective/current Math majors to encourage a healthier faculty-student relationship
- Organizing a discussion series aimed at identifying and correcting the flaws within the MIT Mathematics Department