

Moises Mata

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EDUCATION

Columbia University, BA in Computer Science and Applied Mathematics Sept 2022 – May 2026
GPA: 3.68

RESEARCH & WORK EXPERIENCE

Barnard/Dartmouth Accessible and Accelerated Robotics Lab New York, NY
Undergraduate Researcher Jan 2025 – Present

- Debugging hardware and modernizing codebase for [TinyMPC](#), an open-source convex Model Predictive Control solver designed for resource-constrained platforms. Advising professor: Brian Plancher.
- Extending TinyMPC solver to include Meta Learning capabilities, allowing robots to update their controller to be more optimal online.

Columbia SNL Lab New York, NY
Undergraduate Researcher Sept 2025 – Present

- Part of team working on a lightweight, high-assurance runtime for spacecraft flight software built on eBPF, enabling dynamic yet predictable execution of mission and payload logic under strict safety constraints. Advising professor: Junfeng Yang.
- Responsible for using F Prime, eBPF, and C/C++ to meet realtime requirements by multithreading Duotronic VMs and implementing a miniature scheduler for real-time scheduling to satisfy millisecond rate-group deadlines with bounded execution time. (**Publication coming soon**)

NASA Jet Propulsion Lab, Small Scale Flight Software Group Pasadena, CA
Intern, Flight Software Engineering May 2025 – Aug 2025

- Contributed infrastructural work to the [F Prime](#) flight software framework ([v4.0.0 release](#)).
- Introduced architectural changes enabling projects to use prebuilt flight software stacks (Communications, Command and Data Handling, Filesystem Support).

NASA Jet Propulsion Lab, Exoplanet Discovery & Science Pasadena, CA
Undergraduate Research Fellow May 2024 – Aug 2024

- Conducted a project using Python, scikit-learn, and Jupyter Notebooks, culminating in training binary classification models on simulated observational data and applying them to multi-planet systems observed by Kepler to predict the presence of habitable planets.
- Supervised by Dr. Yasuhiro Hasegawa as part of JPL/Caltech's Summer Undergraduate Research Fellowship. (**Publication coming soon**)

Columbia Center for Student Advising New York, NY
Tutor, Calculus I and Digital Systems Sept 2023 – Sept 2024

- Tutor for Calculus I and Fundamentals of Computer Systems (CSEE 3827); tracked student progress and prepared targeted material for class and exams.

Columbia Astronomy New York, NY
Undergraduate Researcher Dec 2022 – Jul 2023

- Worked with Professor Kathryn Johnston on the study of Milky Way stellar streams using Gaia and Pan-STARRS data.
- Analyzed the substructure of the Ophiuchus stream and created simulations to postulate initial conditions of its formation.

LEADERSHIP EXPERIENCE

Columbia Space InitiativeNew York, NY
Executive Board, Co-President March 2025 – Present

- Elected to **Columbia Space Initiative's** Executive Board by the student body (250+ members).
- As Co-President, organize main events, lead the admin team, and coordinate the club's direction.

Columbia Space InitiativeNew York, NY
Executive Board, Treasurer March 2024 – March 2025

- Manage mission budgets, place orders for parts, and coordinate finances with Mechanical Engineering for budgeting.

PROJECTS

Columbia Space InitiativeNew York, NY
Columbia Flight Software Lead, **PROVES** Alcione (LionCub)Aug 2024 – Present

- 1U CubeSat on a manifested launch for April 2026. Will be Columbia's first object in orbit, with a mission to take pictures of the Earth from space. Part of the larger PROVES project.
- Responsible for implementing vital functionality in the F Prime flight software framework: hardware watchdog checking, load switch management to control power management of sensors.

Columbia Space InitiativeNew York, NY
NASA SUITS Mission Co-LeadSept 2023 – Jul 2024

- Mission Co-Lead for CSI's SUITS Team. Co-authored a proposal that became one of 17 national finalists. Led development and test activities at NASA Johnson Space Center.
- Developed an intuitive AR user interface for astronaut assistance using Unity and C#. Delivered interface deployed on Microsoft HoloLens 2; testers successfully completed test Mars mission upon evaluation at Johnson Space Center.

PUBLICATIONS

Mahajan, Ishaan, Khai Nguyen, Sam Schoedel, Elakhya Nedumaran, **Moises Mata**, Brian Plancher, and Zachary Manchester (2025). *Code Generation and Conic Constraints for Model-Predictive Control on Microcontrollers with Conic-TinyMPC*. IEEE Robotics & Automation Society (In review). arXiv: [2403.18149](https://arxiv.org/abs/2403.18149) [cs.R0]. URL: <https://arxiv.org/abs/2403.18149>.

SKILLS

Programming	C, C++, C#, Python, CircuitPython, MATLAB, F' /F Prime, Unity, scikit-learn, Jupyter
Domains	Robotic Optimization and Control, Embedded Systems, Flight Software
Languages	English, Spanish (native proficiency), French (limited)
Certifications	Amateur Radio (Technician Class)