JONATHAN MA

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Passionate junior-level CS student with experience on an active space mission, embedded software, and robotics.

Education

Cornell University, College of Engineering (Ithaca, NY) *Anticipated Graduation December 2025*

- Computer Science (BS), GPA: 4.0, Dean's List (4 semesters)
- Selected Coursework: Java & Data Structures, Computer Vision, Machine Learning, Systems Programming, Analysis of Algorithms, Multivariable Calculus, Linear Algebra, Intro to Robotics (Fall 2024)

Technical Skills

- Languages (Proficient): Python, Java, C, C++, JavaScript, TypeScript, HTML/CSS, OCaml, PostgreSQL
- Frameworks: Arduino, ROS, OpenCV, NumPy, Pandas, Flask, React, JavaFX, Flutter, Angular, Firebase
- Tools: Git, Jupyter, Docker, Linux, Bash, PlatformIO, Ansible, Elasticsearch, Kibana, Jira

Experience

Cornell Space Systems Design Studio: Alpha CubeSat Flight Software Co-Lead *Oct 2022 - Present*

- Promoted to co-lead (2024) for exemplary performance and taking initiative to learn, leading 5 person team
- Using C++/Arduino to build embedded flight software for CubeSat and light sail payload in Low Earth Orbit
- Developing code for memory constrained microcontrollers to interface w/ avionics (GPS, IMU) & telemetry
- Conducting extensive hardware-in-the-loop integration tests to ensure mission readiness for April 2025 launch
- Built & deployed full-stack ground station with intuitive React control UI, Elasticsearch/Kibana dashboards for mission critical telemetry data, and Nginx reverse proxy
- Converted backend from Clojure to Python to improve maintainability, achieving 40% code reduction

Cornell College of Computing and Information Science: Teaching Assistant *August 2023 - Present*

- Impacted 600+ students in OCaml Programming & Computer Systems classes, served as final project manager

RTX Collins Aerospace: Systems Engineering Intern (SEPP) *Summer 2024*

- Collaborated with group of highly-selective interns to conduct research studies with Raspberry Pi fleet, extend 50K line C++ opensource codebase to support persistency, and present to 500+ interns & executives
- Evaluated feasibility of heterogeneous Information Centric Routing over IP using Named Data Networking

Johns Hopkins University Applied Physics Lab: Ground Software Engineering Intern *Summer 2023*

- Led team of interns through design & creation of Angular and Java based app for parsing binary spacecraft command and telemetry packets for NASA's IMAP and Dragonfly missions, used by 50+ employees
- Applied Agile methodologies and solicited feedback from project leads throughout project duration

CognoTrain, Inc: Software Engineering Intern *Summer 2022*

- Pioneered patent pending cognitive training app for Alzheimer's patients using Flutter & APIs in startup setting

First Tech Challenge Robotics Team #7303: Robot Automation Lead *Aug 2019 - June 2022*

- Won Maryland Tech Invite out of top 32 teams globally, Control Award for most innovative control/automation
- Collaborated with team to implement OpenCV object detection, odometry localization, FSMs & PIDF control
- Developed multistage automation & CV algos which can autonomously generate paths to collect and shoot rings (even while moving) at 5 in target from anywhere on 12x12 ft field
- Created JavaFX simulator for path planning and replaying robot actions to enable testing w/o robot hardware

Programming Projects

- Rubik's Cube Solving Robot, Arduino powered robot optimized to solve a Rubik's Cube in 3-4 seconds
    - Created OpenCV pipeline to scan cube and create Rubik's cube mosaic, breadboarded Arduino circuit
- Happiness App, Social journaling app for users to track their mood and connect with friends. Created Flask, SQLAlchemy & Postgres backend REST API, React & Tailwind frontend UI (100+ users)
    - Implemented end-to-end encryption, token-based auth, Redis job queue, comprehensive test suite/docs
- Infinite Campus Grades++ (JS, HTML), Chrome extension to revamp high school grades UI (4K users)