

MATTHEW S. AI

Active Top Secret Clearance

11590 Parkhurst Square, San Diego, California 92130 | 858-863-3930 | msai@usc.edu | www.linkedin.com/in/matthew-ai

EDUCATION

- B.S. in Electrical and Computer Engineering** Aug 2020-June 2024
University of Southern California, Viterbi School of Engineering GPA: 3.94/4.00
Honors: USC Presidential Scholarship, USC Provost's Research Fellowship, Viterbi Dean's List (2020-present)
Relevant Coursework: Applied Quantum Mechanics, Applied E&M, Linear Algebra, C++ Software Design
- The Bishop's High School**, graduated top 3% in class Aug 2013-June 2020
Honors: Cum Laude, Science Dept. Award, National AP Scholar, Creative Writing Award GPA: 4.86/5.00
Relevant Coursework: AP Physics C, Multivariable Calculus, AP Statistics, Analytic Number Theory

EXPERIENCE

- Undergraduate Researcher, USC Daniel Lidar Group** May 2022-Present
- Attempting to improve known bounds of Ramsey numbers on a quantum annealer using graph theory techniques.
 - Implemented quantum algorithm from scratch in Python and successfully reproduced results from previous paper.
 - Self-studied basic quantum information theory and D-Wave Ocean API for controlling the quantum computer.
- Undergraduate Research Assistant, USC Cronin Research Group** April 2022-Present
- Collecting data on transient cold-plasma-enhanced combustion, working with hydrogen and methane gas.
- Satellite Performance Systems Engineering Intern, Northrop Grumman** May 2022-August 2022
- Studied research papers with subject matter experts to understand the physics of satellite clock synchronization.
 - Implemented C++ simulation of satellite clock behavior and cross-satellite time synchronization, debugged legacy flight software in MS Visual Studio, and authored dozens of header files to fill in for missing, necessary functions.
- Communications Payload Systems Engineering Intern, Northrop Grumman** May 2021-May 2022
- Completed RF data review, EIRP link budgets, graphed downlink spurs and cross-guide coupler calibration data.
 - Composed MATLAB scripts to simulate satellite calibration output logs and ingest AFM files for post-processing.
- Univ. of Michigan Math and Science Scholars Summer Program** July 2018
- Studied college-level Special and General Relativity theory under physics postdocs and Ph.D. candidates.

LEADERSHIP AND INVOLVEMENT

- Avionics PCB Team Co-Lead, USC Rocket Propulsion Laboratory** Aug 2020-May 2022
- Routed circuit boards for FPGAs, microcontrollers, ADCs, low/band-pass filters and more, in Altium Designer.
 - Co-responsible engineer for RF "rangefinder"; contributed to schematics, test procedures, firmware programming.
 - Conducted field tests of RF system to calculate free-space path loss and link budgets from measured attenuations.
 - Wrote C++ code to triangulate rocket coordinates using Eigen linear algebra library for least-squares regression.

PROJECTS

- Created "Trash-Talking Trash Can" RPi IoT product prototype in USC IEEE hackathon team of 4, won 2nd place.
- Built LED bedroom display using ATmega328P RISC processor, programmed in C with Make and AVR toolchain.

HONORS AND AWARDS

- Semifinalist in the 2020 USA Physics Olympiad; finished in the top 300 physics students nationwide on the 2020 $F=ma$ physics competition, and one of only 3 students out of 40,000 in San Diego County.
- Reached 2nd Place regionally in the National PhysicsBowl, scored 25 in the upper Division (highest school score).
- National Honor Roll on AMC 10 and 12; qualified for AIME and scored in top 600 of all math students across U.S.

SKILLS

- | | | | |
|-----------|--------------------|-----------------------|---------------------|
| • C++ / C | • Python / Jupyter | • Altium PCB Designer | • LaTeX |
| • MATLAB | • D-Wave Ocean API | • Git (CLI, GUI) | • Jira / Confluence |