# Mariam Abu-Rahma

Personal website: mariammabu.github.io

## Contact

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Sunnyvale, California

## Education

Current Junior, 11th grade
Class of 2027
Homestead High School

## Technical Skills

Electrical:
- Microcontrollers (Arduino)
- IR communication
- Motor control systems
- Basic circuit design

Design tools:
- KiCad PCB
- Fusion 360

Programming:
- Java
- Python
- C++
- JavaScript/HTML

Other Skills:
- Working in team-based environments
- Leadership qualities
- Prototype development

## Languages

- English
- Arabic

## Hobbies

- Electronic circuits
- 3D Modeling
- Coding
- Karate
- Art Channel

## Personal Profile

- STEM focused high school junior with experience in hands-on engineering projects, robotics, and AI/health research
- Strong communication skills in team environments; mentored young students in STEM workshops and karate coaching
- Seeking internships/research opportunities in electrical engineering, AI, and health-related technologies

## Education

- AP Exams (Scored 5): AP Precalculus, AP Computer Science A, AP Computer Science Principles, and AP Precalculus
- Current Coursework: AP Calculus BC, AP Physics 1, and AP Chemistry
- College Coursework (A grades): 3D manufacturing and design, Java, Python, JavaScript/HTML, and C++ (UCLA)
- 4.0 Unweighted GPA, 4.47 Weighted GPA
- 4× Homestead Green and White Awards

## Technical Projects

- MIT BeaverWorks (Autonomous Systems / Robotics)
  - Programmed an autonomous car using line-following and computer vision systems through OpenCV and HSV to detect lines and color markers
  - Developed closed-loop steering controller commands to convert lateral errors for the contour center of markers into steering angle commands with clamping functionalities
  - Used remapping and error algorithms to control speed around corners and improve stability
  - Strengthened team coordination skills; earned 2nd place overall and Academic Achievement recognition award
- Arduino IR Wand + LED Control System:
  - Designed and built an infrared LED device using microcontroller logic
  - Integrated hardware circuits and software signal processing
  - Working on modeling the circuit into a custom PCB using KiCad
- AIxKumite (In progress)
  - Developing an AI-based video analysis and sensor system tool to detect karate techniques and extract performance data
  - Integrating computer vision and algorithms for data analysis techniques using pose detection and estimation
  - Goal: improve overall player performance using advanced sensors and algorithms
- Other projects include Stair Climbing robot, LED Systems, Ultrasonic Levitator, and more. (Details available on my website)

## Research Experience

- Basys.ai: AI in Healthcare Intern (2 months):
  - Researched LLM processes and worked on improving AI agents for analyzing patient medical records
  - Studied hallucination risks in medical AI systems and the effect of data quality on influence
  - Collaborated with a team of 5-10 interns through daily meetings, frequent progress updates, and feedback
- COVID-19 Research Study (Published)
  - Co-led multi-continent survey-based research study based on behavioral hygienic practices
  - Contributed to data collection and writing
  - Published in *Journal of Emerging Investigators*

## Leadership & Teaching

- USA Karate National Team Athlete (5+ years; ranked #2 world wide)
- International Medalist (Mexico K1 Gold & Silver; Brazil Pan American Bronze)
- Led an International STEM workshop in a community with limited STEM exposure
- Karate Instructor mentoring young athlete
- Instructor for English serving underrepresented students
- Event Coordinator, MSA Club