

Karla Madrigal

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EDUCATION

Cullen College of Engineering, University of Houston, Houston, Texas

Bachelor of Science in Electrical Engineering; Sophomore

Expected Graduation Date: May 2028

Texas A&M International University, Laredo, Texas

Dual Enrollment Program, Systems Engineering Coursework (70 credit hours)

August 2020- May 2024

LEADERSHIP & TECHNICAL PROGRAMS

Institute of Electrical and Electronics Engineers – University of Houston Student Branch

Fall 2024 – Present

- Project Chair, Fall 2025 - Vice President, Spring 2026.
 - Designed reusable technical documentation and onboarding that transformed beginners into active contributors across multiple hardware projects.
 - Mentored and trained committee members to independently design, debug, and teach analog circuits, enabling a rotating, peer-led workshop model and hands-on learning.
 - Hosted workshops to help over 50 members learn practical skills, (Git, GitHub, EasyEDA, KiCad, and Soldering).
 - Held weekly office hours to support students across experience levels (freshman-junior) in circuit design, debugging, and programming.

PROJECTS

- Micromouse - Autonomous Maze Solving Robot | IEEE@UH Student Branch Fall 2024 - May 2025
 - Wrote modular C++ code to integrate IR sensor input and real-time obstacle avoidance.
 - Designed a compact, 2-layer, SAMD21-based PCB, integrating a motor driver, IMU, boost converter, and infrared sensors.
 - Strategically arranged components to optimize autorouter performance and minimize trace length.
 - Calibrated 7 IR sensors for obstacle avoidance and debugged I2C communication protocols.
 - Interactive Modular Dance Floor (In Progress)
 - Collaborated on the design and prototyping of a modular, interactive LED floor for a large-scale public event.
 - Contributed to embedded firmware development and sensor calibration using PlatformIO.
 - Defined scalability constraints for multi-tile systems, including power distribution and signal routing for modular expansion.
 - Created beginner-friendly tasks and documentation to onboard IEEE@UH members using GitHub.
 - Power Systems Design - Ham Radio Supply (In Progress)
 - Explored Li-ion battery design system design for a ham radio power supply by analyzing current requirements, safety constraints, and BMS selection using manufacturer documentation.

EXPERIENCE

Amazon Future Engineer Software Engineering Intern,

May 2025 – August 2025

Amazon Fulfillment Technologies, Bellevue, WA

- Built a full-stack internal web app with React.js, TypeScript, AWS Lambda, CDK, and DynamoDB to let warehouse staff update operational parameters, saving hours of engineering support time.
 - Designed an intuitive, professional UI with robust input validation and user guardrails to ensure safe, non-technical configuration.
 - Refactored frontend code for clarity and maintainability, eliminating duplication and improving readability across the team.

SKILLS AND CERTIFICATES

Embedded & Hardware: PCB Design, KiCad, Sensors, Debugging

Software: C/C++, PlatformIO, Git

Systems: Documentation, Workflow Design, Technical Leadership