

ANDY HUANG

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EDUCATION

Rensselaer Polytechnic Institute

B.S. Computer Systems Engineering

Expected May 2026

Troy, NY

EXPERIENCE

Rensselaer Polytechnic Institute

Undergraduate Researcher

January 2024 – Present

Troy, NY

- Headed development of Music X+, a hybrid in-lab music playback and information hub software.
- Designed a user-friendly web interface for efficient song search, attendance tracking, and music playback.
- Developed a Python Flask backend with Genius API integration for song searching and a custom music player.
- Integrated a MySQL database to track student attendance using RFID data and the university's attendance system.
- Retrieved staff data from the lab's Notion site and displayed it inside the lab for real-time student assistance.

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Mercer XLab Staff

May 2024 – December 2024

Troy, NY

- Organized and managed lab equipment inventory, including equipment loans and delinquency management.
- Taught an introductory workshop on microcontrollers for engineering undergraduates.
- Developed a Notion education module on microcontrollers for students with limited C/C++ and circuit experience.

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Computer Repair Assistant

September 2022 – August 2024

Troy, NY

- Performed data-erasure and imaging on university laptops designated to be loaner devices.
- Handled front desk operations while inspecting student laptops and filing repair requests.
- Organized and archived old reports for storage, ensuring a systematic and accessible record-keeping system.

PROJECTS

OLED Weather Display

April 2025

- Designed and implemented a real-time weather and clock display system on the ESP32 using FreeRTOS.
- Utilized ESP WiFi to sync time via SNTP and periodically fetch weather data over HTTP for real-time display updates.
- Integrated an I2C OLED display with LVGL to render real-time data and manage updates under RTOS constraints.
- Managed concurrent tasks with precise scheduling and inter-task communication using FreeRTOS queues to coordinate data parsing, display updates, and network operations.

SMART Fire Alarm System

August 2024

- Designed a communications system for fast and secure data over wifi, between device and cloud service.
- Configured a Raspberry Pi as the main logic center to read sensor data, trigger alarms based on thresholds, and upload data to the cloud via AWS IoT when the device is internet-connected.
- Created a program to connect an ESP32 to the Raspberry Pi via MQTT, enabling a remote vibrational alarm system.

Racetrack Car Navigation

December 2023

- Created a program for the TI-RSLK Robotic Car, enabling autonomous navigation around an inner barrier.
- Implemented Pulse Width Modulation (PWM) to modulate and control motor speed throughout the driving process.
- Deployed an Encoder Timer mechanism to fine-tune motor speeds, allowing the car to drive in a straight line.

TECHNICAL SKILLS

Languages: C, C++, Python, HTML, CSS, JavaScript, MIPS Assembly

Software & Protocols: ESP-IDF, FreeRTOS, Linux, Git, UART, SPI, I2C, BLE, MQTT

Hardware Platforms: ESP32, STM32, Raspberry Pi

LEADERSHIP / EXTRACURRICULAR

Delta Phi Fraternity

Head of Food and Kitchen Acquisitions

November 2023 – December 2024

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- Consolidated weekly food requests and optimized budget for cost-effective spending and weekly provision purchase.
- Maintained cleanliness and proper organization in food storage areas to ensure fair and safe distribution of space.
- Drafted a weekly fraternity dinner schedule, delegating cooking roles while overseeing the execution of every event.