Matthew Y. Zhu

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Experience

Electrical & Software Team Member August 2023 — Present
Sun Devil Robotics Club – Mars Rover *Tempe, AZ*

- Debugged and commanded rotation of rover motors by testing ODrive's motor firmware on Ubuntu, to deliver critical rover functionality
- Soldered motor connections to motor drivers, supplying critical connections and remote functionality to motors
- Directed electrical and life sciences sub-teams on target extraction design choices and electrical components, resulting in improved team coordination, efficiency and enhanced rover performance

Teaching Assistant - Digital Design Fundamentals August 2023 — Present
Arizona State University *Tempe, AZ*

- Tutored students by clarifying digital design concepts, leading to a 4-point improvement on quizzes
- Guided students on solving missed questions correctly, resulting in better digital design fundamental understanding
- Mentored students with technical issues on lab and homework software enabling punctual assignment submissions

Hardware Volunteer November 2022 — January 2024
ASU Interplanetary Lab Initiative – Deployable Optical Radio Aperture CubeSat *Tempe, AZ*

- Conducted a detailed assessment of an electronic power system to ensure optimal performance by utilizing a simulated battery and solar array. Provided team with essential CubeSat power system electrical data
- Performed a battery capacity test on a demo flight battery using an electronic load and dev board to record current over time. Identified and addressed problems with battery discharge rates and faulty over-current protections
- Collaborated with a mentor to integrate a CubeSat motherboard and a ground computer to obtain flight data and implement commands. Supplied critical flight data and satellite functionality to ground station equipment
- Documented lab activities, communicated progress updates in meetings, and wrote testing procedures to provide team with clear procedures and current CubeSat status

Projects

DHT11 & LCD Driver w/ STM32 ARM Cortex December 2023

- Developed a bare-metal DHT11 and LCD driver on an ARM Cortex STM32 by decoding DHT11 communication protocols to construct strings on an LCD to acquire data and real-time temperature readings
- Debugged system using a logic analyzer to resolve bitwise firmware issues and interfacing with DHT11's proprietary communication protocol at a binary level

Automatic Dog Feeder July 2023

- Designed a PCB with an Arduino Nano microcontroller to autonomously dispense dog food at user-defined intervals through a remote interface. Incorporated an LCD for configuring feeding times and a sensor alerting low food levels
- Developed firmware by writing drivers for remote inputs of feeding times, low food level sensing, and automatic dispensing. Worked with I2C to facilitate communication between components

Freshman Design Project – Medicine Cooler August 2022 — November 2022

- Programmed drivers for temperature sensor and fan to activate at certain temperature thresholds to cool box contents which contributed critical cooling functionality
- Prototyped electronic components on breadboard resulting in reliability and quick deployment of final product
- Modeled cooler using Fusion360 to incorporate electronics, allow efficient cooling, and enhance user experience

Education

Bachelor of Science in Engineering - Computer Engineering Expected December 2025
Arizona State University *GPA: 4.0*

- Clubs: Sun Devil Robotics Club, Machine Learning Club, Software Developers Association

Skills

Languages: Embedded C, C/C++, Python, Java, HTML, CSS, JavaScript
Software: Linux (Ubuntu), Git, GitHub, Altium Designer, KiCad, Fusion 360
Hardware: Schematic reading, Multi-meter, Oscilloscope, Logic Analyzer, Power supply, Soldering, PCB Design