Caleb Andreano

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SUMMARY

Sophomore Computer Engineer with an extensive background in computer hardware including embedded systems, multiple software projects and system integration. Maintained 3.80 GPA while working 20 hours a week as Asset Control Manager for the MSOE IT Helpdesk. Able to learn new technologies quickly and without supervision. Seeking positions in both hardware and software-oriented fields.

EDUCATION

B.S. Computer Engineering BA Minor | Milwaukee School of Engineering | GPA: 3.80 | expected May 2025

PROJECT EXPERIENCE

Portfolio: https://www.andreano.dev

Project Objective: Develop decorative LEDs using distance sensors to allow the LEDs to track and follow a moving person

- Successfully organized and led team of 3 to develop an integrative LED solution
- Developed prototypes using breadboards, 74-series logic and Arduino
- Tested and determined effectiveness of Ultrasonic range sensors and LIDAR
- Wrote Arduino code to control individual LEDs and program effects further than simple tracking
- Integrated and modified existing firmware for Adafruit Feather and NeoPixel controller integration
- Modeled and 3D printed single assembly for final design for the control units, distance sensor and power delivery
- Rebuilt system architecture in C++ to allow for fully-fledged Data Structures, enabling a Tetherball-like game to be playable on the LED loop using custom controllers

Project Objective: Develop image-editing software to perform color transformations and effects

- Created complex UI for image modification, including color tint, inversion, blur and sharpen, as well modification using image filter kernel.
- Developed application to load, convert, and save multiple image formats, including PNG, JPG, BMP, and two custom binary image formats.
- Used event-driven programming principles to monitor GUI for changes and interactions, and functional programming concepts to perform iterative image transformation on data matrices.
- Styled UI using FXML and CSS to create a visually appealing and intuitive interface following the Windows design paradigm

Project Objective: Model a full ARMv4 system architecture using VHDL

- Developed five stages of architecture from base components in VHDL, including the Instruction Memory, Decoder, Arithmetic Logic Unit, Memory Control Unit, and peripheral controller
- Built custom disassembler in C++ in order to interpret raw machine code values on control signals as human-readable GNU Assembly language
- Created custom interpreter-style assembler to enable conversion of single-line Assembly into binary instructions
- Simulated full system on FPGA hardware, including memory-mapped peripherals

OPEN-SOURCE CONTRIBUTIONS

Portfolio: https://github.com/xiugaze

Secret Network Rust Library:

- Created custom API for integrating bech32 encryption into the library, including custom data types for encrypted string conversion
- Developed custom numeric types and associated mathematical operations
- Translated and refactored existing Python libraries into a single library written in Rust, creating large performance gains through zero-cost abstraction
- Developed custom error types that prevent program panic while providing adequate information to users
- Facilitated efficient network communication through multithreading by using async/await design patterns

WORK HISTORY

- **Asset Control Manager** | MSOE IT Helpdesk | September 2021 - May 2022 | 19-20 hrs/wk
- **Waterfront Staff/Lifeguard** | Camp Zion | May – August 2021, May – August 2022
- **Receptionist** | Trinity Holistic Health Center | 2018 - 2020
- **Ride Operator** | Six Flags | February – September 2019
- **System Integrator** | Self-employed | 2017-2018

TECHNICAL SKILLS

- Java
- CSS/HTML/JavaScript
- JQuery
- C/C++
- ARM Assembly
- Rust
- Circuit theory and design
- VHDL and Quartus Prime
- IT Support

LEADERSHIP & CO-CURRICULAR INVOLVEMENT

Embedded Systems Team | SAE Formula Hybrid | September 2022 - Present | 3-6 hrs/wk
Jazz Band | January 2021 - Present | 2hrs/wk
Society of Software Engineers | September 2021 - Present