Benjamin Rotker

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SUMMARY

Detail-oriented Computer Engineering graduate from the Commonwealth Honors College at UMass Amherst. Hard worker with hands-on experience in embedded software development, troubleshooting and optimization.

SKILLS

C, Python, MATLAB, Java, Linux, Arduino, Verilog, Soldering, KiCad, LTspice, Microsoft Suite

EDUCATION

University of Massachusetts Amherst May 2023
Bachelor of Science in Computer Engineering GPA: 3.57
Commonwealth Honors College, Dean's list
Coursework: Abstract Data Structures with Java, Discrete Mathematics, Embedded Systems Lab, Security Engineering, Hardware Design, Communication Systems, Digital Signal Processing, Systems Programming

RELEVANT PROJECTS

Honors Thesis Project Fall 2022 -Spring 2023

- Trained a machine learning model for automated truncation of lecture recording audio in Python
- Created a unique dataset by labelling hundreds of audio segments based on a novel classification scheme
- Navigated the dataset with the Python command line and wrote scripts to evaluate the model's accuracy
- Defended 43-page thesis paper and research results in front of faculty board at honors exhibition

Senior Design Project Fall 2022 – Spring 2023

- Designed, populated, and tested a low noise, mixed signal PCB for modulating electric guitar audio
- Implemented I2S and SPI protocols to communicate data between the MCU, ADC, DAC, and LEDs
- Simulated Op-Amp circuits in Spice to reduce noise before implementing them in the KiCad schematic
- Debugged ADC, DAC, and Op-Amps with a function generator, oscilloscope, and spectrum analyzer
- Analyzed oscilloscope data in MATLAB to determine system SNR and THD

Low Power Embedded Systems Project Spring 2023

- Developed a solar powered sensing application with a Texas Instruments energy harvesting module
- Programmed an ESP32 MCU in Arduino to light LEDs based on sensor data communicated with UART
- Modified the energy harvesting module's hardware to provide the MCU with optimal current and voltage

Image Processing Lab with FPGA Spring 2022

- Programmed an Altera FPGA to capture and process images using a Terasic D5M camera module
- Implemented image processing functions in C, such as timestamps, inversion, and black/white conversion

Networking Security Lab with Python and Linux Fall 2021

- Designed a Python function to compute RSA public and private keypairs using the Euclidean algorithm
- Uploaded RSA & DES encryption code to the ARM processor of an Altera FPGA using Linux
- Encrypted a DES key using RSA and used that key to encrypt an image on the client server
- Sent the encrypted image to the host server through the socket, before decrypting it with the DES key

LEADERSHIP & ACTIVITIES

UMass Dance Marathon
Volunteer Fall 2018 – Spring 2023

- Promoted events and raised funds for Baystate Children's Hospital for five consecutive years

Director of Alumni Relations Fall 2022 – Spring 2023

- Coordinated networking events, maintained contact database, and oversaw Facebook group