Benjamin Rotker

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RELEVANT EXPERIENCE

SharkNinja   Fall 2023 – Present

Test Engineering Contractor

- Applied hardware and software knowledge to the development and enhancement of testing protocols

Image Analysis Software Project

- Created a custom DSLR control, image analysis and spreadsheet generating software in Python
- Programmed an intuitive GUI and file system manager for the above software using the Tkinter library

Testing Device Design Project

- Enhanced a product testing device by redesigning its PCB, software, enclosure, and documentation

Automated Lab Data Analysis Project

- Designed a Python script to automate the data logging and analysis process of a lab environmental sensor

Test Fixture Rapid Prototyping Project

- Built a custom rig and programmed a stepper motor for an urgent product test within a 2.5-day period

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

UNIVERSITY 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
- 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
- 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

SKILLS

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