EVAN SMITH

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EDUCATION

Bachelor of Science in Electrical Engineering - Computer Engineering Graduated May 2024
Ingram School of Engineering - ABET Accredited Program
Texas State University - San Marcos, Texas
Minors in Applied Mathematics and Computer Science
Magna Cum Laude - 3.7 GPA

RELEVANT COURSEWORK

- Intro to Machine Learning
- Digital Signal Processing
- Digital Systems Design & HDL
- Intro to VLSI Design
- Operating Systems
- Software Engineering

TECHNICAL SKILLS

- **Software** - Numpy, Scipy, Pandas, Anaconda: Jupyter Notebook, GitHub, Arduino IDE, VS Code, Maven, Vivado, LT SPICE, MicroWind, Unity, Visual Studio, Mixed Reality Toolkit, Scikit-Learn, TensorFlow, STM32CubeIDE, Putty, Keras, Matlab, SLURM, Powershell, GitHub Copilot, MS Office Suite, Flask, Jira, Gitkraken, React, Firebase, Bitbucket.
- **Languages** - C/C++; C#; Python; Java; Unix/BASH; MIPS32; MATLAB; SystemVerilog; LaTeX; Git; JavaScript; HTML;
- **Hardware** - Soldering, Computer Components, Arduino, Mobile Audio Systems, Remote Super Clusters, STM32, Raspberry Pi, Oscilloscopes, Function Generators, and HoloLens 2. I2S, WebSocket, IP, I2C, UART, SPI

EXPERIENCE

Undergraduate Research Assistant - HiPE Lab June 2023 - August 2023
Texas State University, San Marcos

- Contributed to research findings, *published in the 2024 IEEE 14th Annual Computing and Communication Workshop and Conference (CCWC)*, demonstrating that AR technology has the potential to significantly enhance hygiene training for children with ASD, fostering better habits through engagement and interactive learning.
- Developed an innovative augmented reality handwashing application for HoloLens 2 using Unity and C#, featuring a simulated bathroom environment with interactive elements (sinks, soap dispensers, towels) and a dynamic UI providing step-by-step guidance through audio, visual cues, and interactive feedback.

Customer Service Assistant - H-E-B January 2018 - Present
San Marcos and Leander, TX

- Provided exceptional customer service and contributed to shrink reduction solutions for perishable items.

Senior Design & NASA TSGC Project

- **Ultrasonic Anomaly Detection System** - Contributed to the development of a cutting-edge system in collaboration with a team, utilizing an STM32H7 MCU and MEMS microphones equipped with conical horns for enhanced gain. The system was designed to detect ultrasonic frequency anomalies by continuously calculating the Fast Fourier Transform (FFT) of signals received from six MEMS microphones. Implemented a noise floor creation mechanism for effective noise filtration, while a dynamic detection system employed an offset from the established noise floor. The project also encompassed a user-friendly touchscreen GUI for alarm and voice communication settings.
- **Audio Output System** - Engineered an innovative audio feature for the ultrasonic detection system using an ESP32 MCU as a slave to the STM32 MCU. The ESP32 was programmed to receive FFT data via UART communication, which it then used to sonify detected ultrasonic anomalies through a speaker, akin to a Geiger counter. The ESP32 handled the continuous streaming of voice data over IP, capturing audio through I2S microphones and transmitting it to a server via WebSocket.
- **Ultrasonic Anomaly Localization** - Implemented a localization system utilizing MEMS and machine learning. Utilized a range of technologies, including MEMS microphones, STM32, MATLAB, and Python, along with various machine/deep learning models. Configured the STM32 MCU for continuous FFT calculations, capturing magnitude data for models to use to predict a region an anomaly is located in. Key contributions encompassed the creation of a comprehensive dataset and the development of predictive models for ultrasonic localazation, *published in the 2024 IEE World AI IOT Conference*. Rigorous model assessment employed recall, learning curves, and AUC-ROC metrics to select an ANN, boasting a training/testing accuracy of 99%/97%.

PROJECTS

- **HDL Processor** - Utilized System Verilog and Vivado to develop a processor incorporating matrix and integer ALUs, instruction memory, execution engine, and main memory. Implemented various matrix and integer operations for 16-bit numbers on 256-bit data busses.
- **VLSI 8-bit Adder** - Created a standard-cells layout library of basic CMOS gates in Microwind layout editor designed in 90 nm technology for minimum space and quality of layout work. Designed basic CMOS gates, simulated and sized NMOS and PMOS for equal rise and fall delays in LT-Spice.
- **SWE Web Application** - Collaborated with a team following the Scrum Agile methodology, utilizing for project management and Bitbucket for source control to develop a To-Do List Scheduling App. Designed using React, the application features a user-friendly interface and is hosted on Firebase, providing robust back-end functionality and real-time data synchronization.

ACTIVITIES

Scholarship Chair, Kappa Sigma Theta Lambda December 2020 - Spring 2024
Technical Lead, Texas State University IEEE / Robotics Spring 2023 - Spring 2024

- Organized technical workshops, professional development sessions, and industry representative seminars.
- Led a comprehensive workshop on game development using Unity and C#.