William Tyrrell

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EDUCATION

Worcester Polytechnic Institute (WPI), 100 Institute Rd, Worcester, MA 01609 August 2021- May 2025
Bachelor of Science in Electrical and Computer Engineering. GPA 3.97/4.0
Master of Computer Science. GPA 4.0/4.0

PROJECTS

AI-Powered 3D Facial Generation for Robotics Interfaces, Major Qualifying Project August 2024 - May 2025

- Worked with a partner to develop an AI model for generating facial video for a humanoid robot, focusing on realism and adaptability to 3D surfaces
- Developed a facial generation model using Audio2Face and Unreal Engine and mapped these faces to a flexible LCD in Blender
- Applied FVD, CLIP, and SyncNet scores to evaluate and enhance face realism, incorporating feedback into the Stable-Baselines3 reinforcement learning framework
- Future implementation into a social robot that can answer questions and provide human-like expressions and audio

FPGA-Based Light Sensor with SPI Interface March 2024 - May 2024

- Designed an FPGA-based light sensor system on the Basys 3 FPGA using Verilog and SPI communication to read data from a PMOD ALS (Ambient Light Sensor).
- Implemented a finite state machine (FSM) to manage SPI read cycles and synchronize data on a seven-segment display.
- Developed a clock generation module with a two-stage synchronizer to prevent metastability and ensure proper SPI timing.
- Conducted timing analysis and optimized signal paths to eliminate negative slack, ensuring robust operation.

Texas Instruments EK-TM4C1294XL-Based Digital Oscilloscope October 2023 - December 2023

- Designed and implemented a feature-rich oscilloscope on a Texas Instruments EK-TM4C1294XL microcontroller, including PWM generation, ADC conversion, and real-time signal display with scalable voltage and time divisions
- Integrated RTOS functionality by refactoring interrupt-driven tasks into Hwi objects and organizing waveform, processing, and display tasks using semaphores for synchronization
- Optimized CPU utilization with DMA, significantly improving performance and enabling the implementation of more CPU-intensive features like FFT mode, frequency counter, and audio output

PROFESSIONAL EXPERIENCE

Field Engineer, Northern Construction Service LLC, 1520 US-20, Palmer, MA 01069 May 2024 - August 2024

- Conducted survey layouts and validated construction benchmarks using electronic measuring tools.
- Analyzed and reported production metrics, aiding in project planning and execution.

SPS Intern, American Superconductor, 114 East Main Street, Ayer, MA 01432 May 2023 - August 2023

- Assisted in developing, testing, and assembly of superconducting coils and wire-based systems.
- Designed wiring diagrams and test stations for advanced superconducting applications.
- Utilized SolidWorks, LabVIEW, and Python to analyze and optimize superconductor research and testing methodologies.

IT Intern, IPG Photonics, 50 Old Webster Rd, Oxford, MA 01540 June 2022 - August 2022

- Managed access control and network security to safeguard critical data assets.
- Diagnosed and repaired hardware/software issues for company-wide IT infrastructure.

TECHNICAL SKILLS

Languages/Frameworks: C, Verilog, Python, TypeScript, SQL, JavaScript, HTML/CSS, React, Tailwind, NEXT,js, Node.js, GIT, MIPS
Software: Xilinx Vivado, Code Composer Studio, Solidworks, MATLAB, Visual Code Studio, LabVIEW, Multisim, AWS, Linux, Vitis
Concepts/Lab Techniques: AI, Reinforcement Learning, Digital Circuits, Embedded Circuits, FPGAs, Computer Organization and Assembly Programming, Object- Oriented Programming, Database Structures, Circuit Testing, Electronic Circuit Design, Control Systems, Cryptography, Networks, MicroBlaze, Pipelining, GPIO, ASICs, SoC

AWARDS & ACTIVITIES

WPI Varsity Football Team | *Captain* | *First team All-Conference* | *Academic All-District Team* August 2021 - November 2024
WPI Team IMPACT August 2023 - May 2025
WPI Sigma Phi Epsilon Fraternity August 2021 - November 2025