Kealan Frost

Number ▪ Email ▪ Location ▪ LinkedIn ▪ United States Citizen

Education:

Bachelor of Science in Electrical Engineering – GPA: 3.81 **Aug 2023 – Present**
(UCF) University of Central Florida – Orlando, Fl **Expected Graduation: May 2026**
Relevant Coursework: Electric Machinery, Embedded Systems, Intro to Sensors, Signal Analysis & Analog Communication, Electromagnetic Fields, Semiconductor Devices 1, Electronics 1, Linear Circuits 2, Computer Organization

Work Experience:

Photonic Quantum Semiconductor Devices Lab (Q-Lab) – Undergraduate Research Assistant **Dec 2024 – Present**
- Researching telecom band silicon avalanche photodetectors, maximizing absorption via nanostructures, and ion implantation
- Simulating photon detection efficiency and dark count rate with TCAD software: Ansys FDTD and Ansys CHARGE
- Set up and familiarization with equipment and its uses: optical table, spectrometers, beam splitters, photon counters, etc.

Honda of America Powersports Controls/EV Group – Design and Test Engineering Intern **Jun 2024 – Aug 2024**
- Developed a standalone program via MATLAB that automatically converts CAN message specifications from Excel into a working CAN DBC file, verified with CANdb++ and CANalyzer, increasing testing and development efficiency and speed
- Researched and introduced new EV motor tests and testing methods for motor health and performance testing: motor back EMF, internal spin loss, full load output, and power harmonics/quality measurement, increasing testing and development capabilities
- Facilitated EV drivetrain power efficiency testing, measuring power losses across different drivetrain components: DC/DC converter, battery, motor controller, and motor using DEWESoft and other data acquisition equipment
- Communicated with suppliers sourcing testing equipment for new tests; compiled documents comparing product capabilities and pricings, allowing the purchasing department to accept equipment purchase proposals

Project Experience:

Ultrasonic Rangefinder PCB – Junior Design Class Project **Jan 2025 – Apr 2025**
- Designed and fabricated custom PCBs in Autodesk Fusion 360 for a microcontroller-based system, including schematic capture, component sourcing in Ultra Librarian, and layout for voltage regulation daughter boards and components
- Assembled the PCB boards with surface-mount and through-hole components using solder paste, stencils, reflow oven, pick-and-place machine, and traditional hand soldering techniques
- Programmed an MSP430 microcontroller to interface with PWM-controlled LEDs, ultrasonic sensor, and LCD display

Super State Racer Hybrid Energy Storage EV – IEEE UCF Project Firmware Team Member **Sept 2023 – May 2024**
- Studied motor controller firmware and configuring controller for usage with our specific hardware
- Compiled a list of compatible and cost-effective development boards with CAN, I2C, and UART capabilities; Started CAN bus research for integration across EV's motor controller, battery management, and telemetry system
- Searched for motor encoders and proposed ideas with estimated costs to solve compatibility issues with motor
- Collaborated with mechanical team to discuss device mounting and placement on the EV

Energy Recovery and Vehicle Efficiency Research – Valencia Undergraduate Researcher **Aug 2022 – Dec 2022**
- Reviewed current methods of improving vehicle efficiency, focused on energy retention during vehicle braking
- Surveyed and compiled literature on different energy recovery methods such as mechanical energy storage, electric regenerative braking, and experimental hydraulic energy recovery
- Analyzed literature on electric regenerative braking using temporary supercapacitor storage for superior energy recovery and improved battery health

Skills:

Programming: C (Intermediate), MATLAB (Intermediate), Python (Beginner), Verilog (HDL) (Beginner), MIPS assembly
Software: MATLAB (Intermediate), MATLAB Compiler, LTspice (Intermediate), SolidWorks/CATIA (Beginner), Xilinx's Vivado, Github, Git, CANalyzer, CANdb++, DEWESoft, Ansys Lumerical FDTD (Beginner), MARS MIPS

Affiliations, Honors, and Awards

- **IEEE UCF Chapter Workshop Chair/Director: Apr 2025 – May 2026**
- UCF Burnett Honors College scholar; Dean's list (Fall 2023, Spring 2024, & Fall 2024)
- Valencia Seneff Honors College graduate; President's list (Spring 2021, Fall 2021, Spring 2022, & Fall 2022)