

BLAINE C. RIEGER

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EDUCATION

Loyola Marymount University, Los Angeles, California August 2019 - Expected 2025
Master of Science, Electrical Engineering
Graduate Thesis Title: "Modeling Driver Perception of Accelerator Pedal Input"

Worcester Polytechnic Institute, Worcester, Massachusetts August 2012 - May 2016
Bachelor of Science, Electrical and Computer Engineering
Undergraduate Major Qualification Project Title: "Smartphone-Based 12-Lead Electrocardiogram"

WORK EXPERIENCE

Novanta (Formerly Motion Solutions), Irvine, California November 2022 - August 2025
Electrical Engineer

- Designed and integrated embedded control systems for precision electromechanical subsystems in medical, life science, semiconductor, and defense applications.
- Developed and validated multi-layer PCBs; performed prototyping, troubleshooting, and design revisions.
- Collaborated with cross-functional teams on high-precision motion control systems and automated platforms.
- Tuned motion stages and verified accuracy/repeatability using laser interferometry and precision metrology.
- Supported cable harness assembly and inspection per IPC-A-610 and IPC/WHMA-A-620 standards.
- Authored and maintained schematics, cable drawings, fixture layouts, and operational manuals.

Engineering Innovations, Rancho Santa Margarita, California September 2021 - November 2022
Manufacturing Assistant

- Operated and set up multi-axis vertical mills and lathes to manufacture precision components for government and commercial contracts, ensuring adherence to specifications.
- Managed material inventory, optimizing stock levels to support uninterrupted production workflows.
- Conducted thorough inspections of components, maintaining high quality and compliance with ISO standards, contractual, and regulatory requirements.

Loyola Marymount University, Los Angeles, California May 2019 - December 2022
Graduate Research Lab Assistant

- Assisted in research at the Rehabilitation, Assistive Technology, and Human Control Theory (REACT) Lab, developing, fabricating, and testing electrical hardware and software for laboratory experiments.
- Maintained simulators and test fixtures, ensuring reliable and accurate experimental setups.
- Guided and supported undergraduate students in performing research studies, providing training on lab equipment, experimental procedures, and data collection.

Rye Electric, Rancho Santa Margarita, California May 2020 - August 2021
Engineering Consultant

- Served as a technical advisor on prototype development of wearable devices undergoing the patent process.
- Programmed and modeled components for early-stage prototypes, supporting design iteration and testing.
- Led manufacturing and machining process development to enable scalable prototype production.

Rye Electric, Rancho Santa Margarita, California July 2016 - August 2018
Project Engineer

- Supported commercial electrical engineering projects in accordance with approved technical specifications and engineering drawings.
- Provided on-site technical expertise, advising management on engineering decisions and resolving technical challenges.

RESEARCH PROJECTS

Tripoli Level 3 High Power Rocket

Present

Personal Project - Level 3 Attempt Flight - Min. Total Impulse of 5,120.01 (N·s) - M Class Motor

- Developed an ARM-based embedded flight computer with battery management, deployment circuitry, avionics, and RF/GPS telemetry for real-time tracking.
- Designed and fabricated composite structural and aerodynamic components, simulating flight performance across motor and payload configurations to ensure stability and safety.

Modeling Driver Perception of Accelerator Pedal Input

Present

Loyola Marymount Research Assistant / Master's Thesis

- Designed and implemented hardware and software to investigate the relationship between drivers' perceived accelerator pedal input and the actual measured input.
- Developed a modeling framework capable of generating reference tables for practical application in vehicle control and driver behavior analysis.

Smartphone-Based 12-Lead Electrocardiogram

December 2015

Worcester Polytechnic Institute Major Qualifying Project

- Designed a multi-PCB ECG system with an analog front-end for signal acquisition, interfacing with an ARM microcontroller for analog-to-digital conversion and smartphone communication.
- Fabricated and assembled PCBs, including solder paste application, component placement, reflow, and rework, ensuring accurate ECG signal measurement and reliable system operation.

PUBLICATIONS

Friedman, J., Murphy, S., and **Rieger, B.C.** "Inexpensive, Portable, Smartphone-Based 12-Lead Electrocardiogram." *Worcester Polytechnic University*, 2015.

CERTIFICATIONS

IPC-A-610 Acceptability of Electronic Assemblies

2025

IPC-A-620 Requirements and Acceptance for Cable and Wire Harness Assemblies

2025

Tripoli Level 3 High-Power Rocketry

Expected Completion 2026

Tripoli Level 1 & 2 High-Power Rocketry

2015 - Recertify 2025

AWARDS AND SCHOLARSHIPS

Eagle Scout, Boy Scouts of America

2011

SKILLS

Embedded Systems: STM32, AVR, and ARM Cortex-M microcontrollers; firmware development in C; SPI, I2C, CAN, UART, USB; board bring-up, debugging, and validation.

Hardware Design: Analog/digital circuit design with op-amps, ADCs/DACs, sensors, and actuators; multi-layer PCB layout in KiCad, Eagle, Altium; Verilog and VHDL; fabrication, reflow and hand soldering, and prototype testing.

Testing & Measurement: Oscilloscopes, function generators, logic analyzers, VNAs; thermal and reliability testing; MATLAB and Python for data analysis.

Mechanical & Prototyping: 3D modeling in SOLIDWORKS/Fusion 360; rapid prototyping via 3D printing and machining; BOMs, assembly drawings, and documentation.

Standards & Compliance: IPC/WHMA, ISO, and MIL-STD practices.