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.