Scott Torzewski

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EDUCATION

Lafayette College: *Bachelor of Science, Electrical and Computer Engineering | Math Minor* *May 2025* | **Easton, PA**
Saint Louis University: *Engineering Study Abroad* *Spring 2023* | **Madrid, Spain**

SKILLS

Languages & Platforms: LTspice • Altium • KiCad • Python • SQL • MATLAB/Simulink • LabVIEW • SystemVerilog
Technical: PCB Layout & Design • Analog & Digital Circuits • Embedded Systems & Microcontrollers (I²C/SPI/UART) Power & Control Systems Modeling • Optoelectronic Instrumentation • Semiconductor Devices • Signal Processing

PROJECT EXPERIENCE

Adaptive Smart Home for Users with Motor Impairments *Submitted to the IEEE, May 2025*
- Developed a scalable smart home frame-work incorporating an adaptive remote control device for directional input.
- Integrated transmissive photomicrosensors with custom physical hardware to interrupt laser and enable signal register.
- Designed automated security system with motion-sensing 320x240 JPEG capture at 10 FPS for real-time monitoring.
- Achieved sub-second latency (0.9s worst-case) from image capture to display by optimizing UART transmission.
- Designed robust smart locking system with redundant power supplies. Utilized MOSFET and photocoupler electrical isolation for power reliability. Optimized PCB layout and simulated in LTspice to reduce inrush current by 40%.

Fluorescence-Based Spectrometer with High-Performance Analog-Front End *September 2025*
- Engineered a fluorescence detection system with a PWM-controlled LED excitation source and a multi-stage analog front-end, including a zero-drift integrator and a logarithmic amplifier to maximize range for fluorescence signals.
- Integrated differential output stage to eliminate common-mode noise and boost SNR for ADC conversion.
- Validated hardware design by characterizing fluorescein's spectral behavior (495nm excitation, 520 nm emission).

Biomedical Systems: Mathematical Modeling, Laboratory Experimentation *December 2024*
- Modeled enzyme clustering in MATLAB/Simulink, achieving 92% predictive accuracy for metabolic behavior.
- Optimized signal acquisition protocols across 20+ physiological trials for ECG, EEG, and spirometry measurements.
- Applied sensor instrumentation and circuit design principles to extract actionable biomedical insights from real-world cardiovascular, respiratory, and nervous system datasets, supporting wearable and clinical monitoring applications.

WORK EXPERIENCE

ABEC, Inc. - *Electrical Engineer* *June 2025 - Present* | **Bethlehem, PA**
- Designed and implemented power and control systems for bioreactors, fermenters, and chromatography platforms.
- Integrated sensor arrays (UV, NIR, pH, O_2/CO_2, conductivity, optical density, RTDs) into 24 VDC, 480 VAC circuits.
- Applied EE principles to measurement and control of cellular and biochemical processes, linking instrumentation to cell therapy platforms. Collaborated with biopharma clients to ensure compliance with U.S. & international standards.

Day & Zimmerman | Mason & Hanger - *Electrical Engineering Intern* *May 2024 - August 2024* | **Lexington, KY**
- Modeled critical power infrastructure in CAD/BIM platforms for federal government and military facilities.
- Supported 3 successful project bids through detailed schematics, system modeling, and cost estimates.
- Leveraged mathematics and problem-solving skills to address high-priority challenges. Optimized power connections across large complex by implementing innovative daisy-chaining design, saving ~$20,000 by removing power supply.

LEADERSHIP EXPERIENCE

Johnson & Johnson - *Technology Awareness Program (TAP)* *June 2022*
- As project lead, orchestrated the design of a scalable mobile hospital network featuring optimized navigation and an HTML-based web interface, successfully enabling patient health capabilities in underserved regions of Nigeria.

Boy Scouts of America - *Eagle Scout | Meritorious Award | World Conservation Award* *March 2013 - August 2018*
- Spearheaded construction of durable roof for local dog shelter, leading 35 volunteers. Totaled 125 project hours.

RECOGNITION & COURSEWORK

Awards: Eagle Scout, BSA • Marquis Scholar, Lafayette College • Bergh Family Fellow Recipient
Relevant Courses: Sensors & Electronic Systems • Digital Circuits • Embedded Systems • Engineering Electromagnetics Solid State Circuits • Biomedical Systems • Signals & Systems • Communication Systems • Statistics • Probability