Zachary Kull

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Education

University of Illinois at Urbana-Champaign Expected May 2028

Bachelor of Science in Electrical Engineering, Minor in Semiconductor Engineering ***GPA 3.74 /4.0***

- **Relevant Coursework**: Analog Signal Processing, Computer Systems and Programming, Integrated Circuits, Digital Systems Laboratory, Semiconductor Electronics

Experience

TenderTrak May 2025 – Aug. 2025

Hardware Engineering Intern *Palatine, IL*

- Developed a low-power marine tracking device integrating Bluetooth, GPS, LoRa, and solar charging
- Designed the schematic, PCB layout, and bill of materials for the tracking device using **KiCad**, optimizing component selection and layout to achieve an efficient, cost-effective, and compact form factor for the design
- Integrated serial communication buses (**I2C**, **SPI**, **UART**) at the hardware level during PCB design
- Optimized a reference design's power consumption in **C++**, enabling the device to operate entirely on solar power

Ghost Electric Motorcycles Jan 2025 – Present

Electrical Team Member *Champaign, IL*

- Collaborated with the electrical team to design a high-capacity battery system for an electric motorcycle
- Performed electrical and energy calculations to optimize battery performance, safety, and efficiency
- Designed the battery pack layout and form factor in **Fusion 360** for 18650 cells, ensuring compatibility with chassis constraints while maintaining structural integrity and effective thermal management

Mariano's Mar. 2024 – Aug. 2024

Bakery Clerk *Palatine, IL*

- Delivered proper customer service by assisting customers with product selection, answering questions, and maintaining a clean, welcoming, and well-organized bakery environment
- Prepared, packaged, and labeled bakery products in compliance with food safety and sanitation standards
- Trained and onboarded new team members on departmental procedures to ensure consistent performance

Projects

Real-Time Stock Ticker LED Display Jan. 2026

- Designed and implemented a real-time stock ticker using **Python** and a **Raspberry Pi** with an LED matrix
- Built a multithreaded data-fetching system using the Finnhub API to retrieve live stock prices, compute percent changes, and update color-coded trend displays in real time
- Automated retrieval of NASDAQ-100 tickers using **Pandas** with web scraping and CSV caching for fault tolerance
- Tuned RGB LED matrix hardware parameters (PWM, GPIO mapping, brightness) for flicker-free display output

Robotic Car with Audio Triggered Controls Dec. 2024

- Designed an autonomous robotic car integrating a multi-stage audio processing circuit—including amplification and peak detection—with PWM-controlled H-bridge drivers for bidirectional movement
- Debugged and tuned motor speed control using **power supplies** and **oscilloscopes** for PWM analysis

Technical Skills

Design Tools: KiCad, Altium, LTSpice, Fusion 360
Lab Equipment: Oscilloscope, Logic Analyzer, Function Generator, Power Supply, Multimeter, Soldering
Programming Languages: C, C++, Python, MATLAB, SystemVerilog
Developer Tools and Platforms: Git, GitHub, Bash, Zephyr RTOS, Arduino Framework, PlatformIO, VS Code

Extracurriculars

Beta Theta Pi Philanthropy Chair May 2025 – Dec. 2025

- Developed and managed a comprehensive philanthropic calendar, ensuring the timely execution of all fundraising campaigns and volunteer efforts, with proceeds benefiting the chapter's designated charity
- Organized and led a chapter-wide fundraising event, raising $1,000+ in support of philanthropic causes
- Implemented regular volunteer service outings with local non-profits for the first time chapter history, increasing chapter's total semester service hours by over 50% compared to previous semester