Samit Madatanapalli

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US Citizen

TECHNICAL EXPERIENCE

Esotaira: Military Omnidirectional UAV (Startup) 08/2025 – Present
Capstone | Embedded Software Lead *University Park, PA*

- Developed C++ control firmware for a military-oriented omnidirectional UAV, implementing precise 0–90° tilt and thrust modulation for omnidirectional maneuvering
- Designed and built the UAV's electrical system, handling wire routing, soldering, heat-shrinking, and hot-glue reinforcement for reliable functionality
- Supported mechanical integration by fitting and finishing Onyx 3D-printed drone parts and contributing to the build of a durable testing enclosure made from epoxy-glass sheets and a wood base
- Delivered weekly project updates to sponsors, communicating progress and technical decisions

Honeywell 05/2025 – 08/2025
Intern | Software Engineer *Pittsburgh, PA*

- Designed and deployed a mobile device free fall feature for the Honeywell embedded Linux devices, implementing real-time sensor processing in C and validating functionality through drop testing using specialized equipment
- Reverse-engineered legacy battery charger systems by analyzing MCU-to-battery communication (I2C, UART, 1-Wire) using Saleae logic analyzers, Perl scripts, and DMM, enabling preservation of critical functionality in next-generation chargers and ensuring safe, reliable operation with both new and legacy batteries
- Developed Python and shell scripts to capture Adaptive Frequency Hopping (AFH) data from Honeywell Bluetooth headset connections and convert logs into 2D channel map visualizations, supporting efforts to understand RF behavior behind a major customer-reported connectivity issue
- Automated performance log analysis by building a Python tool to extract and visualize performance metrics from Honeywell embedded Linux device logs, streamlining debugging workflows and eliminating manual analysis for the electrical team

Flourish: Grow with Self-Care (Startup) 01/2025 – 05/2025
Intern | Full Stack Mobile Application Engineer *Remote*

- Led end-to-end development of the "Plants Encyclopedia" screen, crafting an animated, interactive UI with expandable dual-card layouts, horizontal scrollable selections, and a live search bar using JavaScript and React Native
- Built and integrated backend services with Appwrite and Python, merging plant metadata and user preferences to deliver dynamic, personalized content across platforms
- Collaborated closely with product and design teams to translate feature requirements into intuitive user interfaces, ensuring alignment with the app's visual identity and user experience goals

Thermo Fisher Scientific - Persistent Systems 05/2024 – 08/2024
Intern | Data Engineer Mentee *Remote*

- Refactored and optimized my personal AI Fitness Tracker project using enterprise-grade tools like ER/Studio, SQL, and Excel to align with professional data modeling and governance standards
- Designed normalized database schemas to support scalable storage of user health metrics, dietary inputs, and AI-generated nutritional analysis, improving query efficiency and data integrity
- Collaborated with mentors in daily syncs to refine workflows and apply best practices in data transformation and reporting

EDUCATION

The Pennsylvania State University | College of Engineering — Expected Graduation: 05/2026

- B.S. in Computer Engineering — *University Park, PA*
- Dean's List 2023-2024-2025 — GPA: 3.46

PROJECTS

Offline AI-enabled Drone — 09/2025 – Present

Embedded Lead — *University Park, PA*

- Engineered a self-stabilizing surveillance drone with custom flight controls, real-time video streaming, and sensor telemetry for field surveillance scenarios
- Built on-device AI image recognition to overlay real-time object labels directly onto the video feed.
- Led system integration, hardware prototyping, and iterative flight testing to improve drone reliability and usability within course constraints

5-Stage Pipelined Processor with Hazard Detection and Forwarding — 08/2024 – 12/2024

Independent — *University Park, PA*

- Designed and implemented a pipelined processor in Verilog using Vivado, integrating core modules like ALU, control unit, memory, and hazard/forwarding logic to support 5-stage execution
- Verified functionality through waveform analysis and iterative debugging, ensuring accurate instruction execution under data/control hazards

Audio Amplifier Circuit Design Project — 04/2024 – 05/2024

Test Lead — *Erie, PA*

- Designed and built a multi-stage amplifier circuit, including a summing op-amp (stereo to mono), tone filter, voltage divider, LED volume indicator, and fixed-gain amplifier using NPN/PNP transistors
- Validated signal processing accuracy using oscilloscopes, function generators, and industry data sheets
- Presented project to professor and peers, demonstrating functionality, optimizations, and potential applications

Artificial Intelligence Fitness Tracker Web Application — 07/2023 – 03/2024

Independent — *Pittsburgh, PA*

- Developed a full-stack fitness tracker using Java Servlets, HTML, CSS, and JavaScript, offering an intuitive and natural interface for users to log health data and receive personalized insights
- Integrated ChatGPT API for natural language dietary input, providing real-time nutritional analysis including calories, protein, and carbohydrates
- Designed and connected a MySQL database to securely store user metadata, enabling custom caloric intake calculations

SKILLS

Software: C, Python, Java, HTML/CSS/JS/React, Verilog, SQL, MySQL, Appwrite, OpenCV, TensorFlow, Git, Vivado, ER/Studio, HCS12 Assembly, VS Code, Unity, Linux command line, shell scripts, service files, Perl scripts

Hardware: Arduino, microcontrollers, sensor integration, circuit design, waveform analysis, oscilloscopes, function generators, Saleae logic analyzer, breadboard

Professional: Problem solving, debugging, teamwork, communication, JIRA/Confluence documentation, project management