Jack Balthasar

jlbalthasar@crimson.ua.edu 404-895-1721 jb.balthasars.com

OBJECTIVE

Seeking a full-time role in IoT, Robotics, or AI/ML to apply and grow technical skills in developing innovative systems.

EDUCATION

Ph.D. Candidate in Electrical Engineering, The University of Alabama, Tuscaloosa AL, May 2029

Bachelor of Science in Electrical Engineering, The University of Alabama, Tuscaloosa AL, May 2025

WORK EXPERIENCE

USGS FLOW Summer Academy, Tuscaloosa, AL, Summer 2025 May 2025 – August 2025

- Mentored teams on robotics, IoT, edge computing, and sensor integration for real-world water monitoring challenges.
- Improved solar-powered, IoT-based flood warning systems with real-time alerts and multimodal sensing (LiDAR + camera).
- Provided field support for sensors, drone imaging, and remote sensing for water quality monitoring.
- Supported development of high-frequency water level systems using PIV, LiDAR, and low-cost edge devices.
- Assisted with autonomous ASV/AUV deployment for current velocity profiling post-flood using ADCPs.
- Coached students on data acquisition, system integration, and deployment aligned with USGS HIF workflows.
- Collaborated with faculty and USGS engineers to troubleshoot hardware/software issues in real-time field deployments.

Mercedes-Benz USA, Vance, AL, August 2024 – May 2025

- Developed automated auditing system for shower test stations, improving reliability and traceability across team operations
- Designed custom PCBs in KiCad integrating microcontrollers, RF modules, ADCs, and power management (boost converters)
- Engineered components using 3D printing and CNC machining for functional prototypes and hardware integration
- Collaborated cross-functionally with quality assurance, manufacturing engineers
- Implemented RF-based wireless communication between microcontrollers and embedded Linux systems (e.g., Raspberry Pi)
- Designed product enclosures and mechanical interfaces in SolidWorks for prototyping and production
- Programmed Python scripts with serial communication to log and analyze real-time sensor and device data
- Built interactive Power BI dashboard for logging, filtering, and visualizing car fault metrics from production line

Mazda Toyota Manufacturing, Huntsville, AL, Summer 2024 May 2024 – August 2024

- Evaluated panel board energy usage and split utilities
- Created html web-view and Windows form app for interactive map and to store data from energy panel usage in database
- Power Distribution Board automation project
- Presented findings to engineering and management
- Power BI dashboard design and custom embedding into software with SQL database
- Worked with controls engineers to debug and solve issues

MMIC Medical Systems, St Johnsbury, VT, Summer 2021 May 2021 – August 2021

- Controls Software Engineer contractor
- Evaluated different software for engineers to use for data automation
- Ignition, XLReporter, Excel data Management
- Developed automation software using python and excel to display data
- Monitoring of Air Temperature, Relative Humidity, Room Temperature, Water Resistivity, Water Temperature

LEADERSHIP EXPERIENCE

Technical Lead, IEEE Hardware Competition, Tuscaloosa, AL, Augst 2024–May 2025

- Responsible for integration using Raspberry pi 4 and camera module
- Used Open CV and April Tag libraries for real-time computer Vision and processing
- Ultrasonic accelerometer, gyroscope, and compass for field navigation
- Microcontroller and microcomputer communication
- Used Arduinos and motor drivers to control motors for movement
- Supervised and Reinforcement Learning

TECHNOLOGY EXPERTISE

- Designed custom PCBs, 3D printed, and coded exoskeletons and environment
- Have built web scraping bots to pull information from websites
- Home automation (Self making bed, Automated window blinds, connected home) using ESP8266s, Solidworks, Bluetooth, AWS Lamba, IFTTT, APIs