

# ALMA BABBITT

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## PROFESSIONAL SUMMARY

Computer engineer with hands-on experience with embedded systems and LLM-based automation. Adept with FreeRTOS, C/C++, Verilog, and hardware/software co-design. Seeking full-time roles starting June 2025 in embedded systems engineering, digital design and verification, or network engineering.

## EDUCATION

**BSE Computer Engineering** – Arizona State University

Graduation: December 2024

**Honors:** New American University Scholar, 4x Dean's List

GPA: 3.62/4.0 - Magna Cum Laude

**Relevant Coursework:** Comp. Architecture, Reconfigurable Computing, Analog & Digital Circuits

## TECHNICAL SKILLS

<b>Languages:</b>	C, C++, Python, Verilog, Assembly, Bash, Tcl
<b>OS &amp; RTOS:</b>	Debian, Ubuntu, FreeRTOS
<b>Hardware:</b>	ESP32, FRDM KL46Z, PYNQ-Z2, Kria K26C, Artix 7
<b>Tools:</b>	Git, LTSpice, MATLAB, Cadence, Vivado, Questasim, Vitis
<b>Protocols:</b>	UART, SPI, I2C, UDP, TCP

## PROFESSIONAL EXPERIENCE

**LLM Research Intern** – Arizona State University | Python, Bash, Verilog, Questasim

August 2023 – December 2024

- Developed Python pipelines and Bash tools to scrape and preprocess HDL repositories into structured datasets
- Created graph-based algorithms to analyze Verilog module dependencies and auto-generate optimized Makefiles
- Evaluated prompt engineering methods for LLaMA 3.1 to synthesize testbenches from dependency graphs and metadata
- Collaborated with professors weekly to analyze progress and set goals

**Teacher Assistant** – Arizona State University

August 2023 – December 2024

- Developed course assignment and graded programming homework for 100+ students
- Provided 1-on-1 guidance on algorithm design and complexity analysis
- Met with professors and master's student weekly to discuss curriculum and student progress

**Retail Associate** – Bass Pro LLC., Mesa, AZ

June 2022 – Present

- Providing customer-focused service in collaboration with my team members to generate \$10K-\$20K in weekly revenue

## PROJECTS

**GPRS Security Camera** – Python, C++, ESP32, FreeRTOS, UDP

March 2025 – Present

- Independently developing a battery-powered LTE-connected camera system with no Wi-fi dependency
- Implemented multithreaded FreeRTOS tasks to synchronize real-time image capture and network transmission
- Switched from TCP to UDP to reduce latency and improve throughput; achieved **325 kbps & 10fps** with SVGA compression
- Adapted TinyGSM to support UDP APIs (connect, begin, write, end, close)
- Designed metadata tagging and chunking system for MTU-aware file transfer and reassembly
- Planned future enhancements: H.265 hardware accelerator, SSL encryption, advanced multithreading

**Matrix Multiply Accelerator** – C++, Kria K26C

March 2024

- Built a high-speed matrix multiplication IP core using Vivado HLS
- Applied loop unrolling and pipelining for 10% performance gain over software implementation

**Differential Amp** – Cadence

November 2024

- Constructed and simulated differential amplifier with passive load and current source biasing
- Validated theoretical vs. simulated performance metrics and met power and voltage specification thresholds

**Autonomous Robot** – C, FRDM KL46Z

September 2023

- Programmed real-time motor control using PWM and I2C sensors
- Leveraged documentation and register level debugging to achieve autonomy

## LEADERSHIP ROLES

**Service Missionary** – Church of Jesus Christ of Latter-Day-Saints

2018 – 2020

- Managed large-scale humanitarian efforts including disaster recovery and home construction impacting hundreds of lives

**Eagle Scout** – Boy Scouts of America

2012 – 2016

- Led Volunteer groups of 20 people in community restoration and service projects