ALMA BABBITT

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SUMMARY

Computer engineer with hands-on experience with embedded systems and LLM-based automation. Adept with C/C++, Verilog, and hardware/software co-design. Seeking full-time roles starting June 2025 in hardware validation and embedded systems 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: Computer Architecture, Reconfigurable Computing, Analog & Digital Circuits

TECHNICAL SKILLS

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

WORK EXPERIENCE

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

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 methodologies for LLaMA 3.1 on cloud computing GPUs to synthesize testbenches from dependency graphs and metadata
- Organized Agile Scrum meetings 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 a multi-disciplinary team of professors and master's student weekly to discuss curriculum and student progress

PROJECTS

4G LTE Security Camera – *Python, C++, ESP32, RESTful, UDP, RISCV* *March 2025 – Present*

- Developing a battery-powered LTE-connected camera system to send video to a server without 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

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

Matrix Multiply Accelerator – *C++, Kria K26C* *March 2024*

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

Autonomous Robot – *C , FRDM KL46Z, ARM* *September 2023*

- Bare metal 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