Abraham J. Marsh

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Objective

Electrical Engineering student with a strong foundation in digital design, circuit analysis, and embedded systems. Experience developing automated systems and optimizing processes to enhance efficiency and compliance. Seeking an internship in robotics, embedded systems, or hardware engineering starting May 2026. Willing to relocate.

Education

Georgia Institute of Technology | Atlanta, GA   *July 2022 – Present*
Bachelor of Science in Electrical Engineering, GPA 3.88   Expected Graduation, Dec 2026

Experience

L3Harris Technologies | Alpharetta, Georgia   *May – August 2025*
Systems Engineering Intern

- Engineered a Python-based touchscreen GUI on Raspberry Pi to control and automate 18 industrial PCB reflow ovens, streamlining operator data entry and reducing errors.
- Integrated oven controller GUI with factory SQL database for configuration and bake data logging, ensuring full traceability of each PCB product across its unique 3-10 bake cycles and supporting failure analysis.
- Established a local Git repository on the factory network for collaboration and version control of the oven controller GUI.
- Automated oven controller GUI updates, ensuring consistent functionality across 18 ovens and removing manual intervention.
- Wrote DXL scripts for IBM DOORS to create requirements traceability matrix for customers and detect missing links between requirements, test cases, and test results for over 200 high level requirements.
- Built a multi-threaded Python parser to process over 10 million test data points for highest volume product, standardized database updates, and integrated results into Power BI for streamlined analysis.

Georgia Tech Integrated Computational Electronics Lab | Atlanta, Georgia   *August 2024 – May 2025*
Undergraduate Researcher

- Integrated analog circuits into an FPAA (Field Programmable Analog Array) audio feature extraction chain, validating toolchain improvements and demonstrating analog computing applications.
- Developed a fixed-location feature in the python toolchain to constrain circuit placement on the FPAA, minimizing parasitic capacitance and routing losses.
- Optimized delay circuit for FPAA architecture to achieve 15 microsecond delays (up from 5 microseconds).
- Quantitatively characterized delay and attenuation across frequencies and biasing modes to assess design trade-offs.

Fluke Corporation | Everett, Washington   *May – August 2024*
Electrical Test Engineer Intern

- Troubleshot and maintained test stations of 27 different product lines in a high-volume facility that produces digital multimeters (DMM), clamps, and process calibrators.
- Used TestStand, LabVIEW, and NI Vision Assistant to create an Automated Optical Inspection (AOI) station that scans the faceplate of 600+ DMMs daily to flag mismatches to prevent units with incorrect or damaged icons being shipped.
- Integrated AOI station with the factory database to auto-generate fail reports including failure step, target icon, and detected icon, enabling rapid technician resolution. Station caught on average 11 erroneous units daily.
- Delivered AOI station cost, setup, and maintenance plan to enable plastics department to replicate the system.
- Owned investigation of 4% clamp meter failure; traced root cause to EMI shielding contacting beeper leads due to out-of-tolerance parts and implemented supplier side lead-trimming as a cost-effective counter measure.
- Presented Run Through Yield and Defective Parts Per Million metrics, which were the Key Performance Indicators of quality, and facilitated cross-functional communication during daily factory meetings to close target gaps.

Skills

Programming: Python, C/C++, Java, MATLAB, C#, SQL, Assembly, VHDL, IBM DOORS/DXL
Software Tools: LabVIEW, TestStand, Git, GitHub, JIRA, Confluence, PLM, AutoCAD (Fusion 360), Cura Slicer, Prusa Slicer, Power BI
Hardware & Embedded Systems: FPGA, ARM Processor, RTOS, Arduino, Raspberry Pi, Linux, SSH, Altera Quartus, Xilinx
Fabrication & Prototyping: 3D Printing, Laser Cutting, Soldering
Lab Equipment: Oscilloscope, Function Generator, LCR Meter, DMM, Calibrators
Engineering Practices: Failure Analysis, Root Cause Analysis, Process Optimization, Requirements Management
Communication: Large Group Presentation, Cross-Functional Collaboration, Technical Manuals and Reviews

Projects

Arm Processor Based RPG Game | Programming for Hardware Systems   *December 2024*
Individual Project
- Developed a top-down 2D game in C++ using an ARM-based MBED processor, LCD, switches, and an SD card reader, with two unique maps, four quests, collectible items and powerups, four unique enemies, a scoreboard, and a final boss.
- Programmed a custom linked list hash table with supporting functions to store 3500 map items.
- Created a save/load game feature that writes and retrieves the game state on an SD card for power-off persistent saves.

Home SSH Server | Personal Project   *January 2024*
- Repurposed an old laptop into a Linux server, for remote access via SSH to host websites and game servers.
- Implemented security measures, including fail2ban, non-default SSH port configuration, and SSH key-based authentication, to safeguard the server and home network.
- Port forwarded on local network through two routers to server for SSH access from anywhere in the world.

Servo Motor Driver on FPGA | Digital Design Lab   *April 2024*
Hardware Lead
- Worked in a team of four people to create a servo motor driver on an FPGA over a four-week period.
- Designed a controller in VHDL for an FPGA to individually move four servos with 180 degrees of resolution.
- Created PWM generator using inputs from four 8-bit registers and clamped outputs to ensure out of range inputs would not damage servo motors.
- Implemented capability to link servos using input from a 5th register, allowing a single register to control more than one motor if desired.
- Utilized signal tap logic analyzer to debug and validate design implementation.

Relevant Coursework

Advanced Programming Techniques: Application of advanced C++ techniques for complex engineering tasks; CMake; SFML 2D graphics; OpenGL; multi-threading; distributed computing; UDP/TCP sockets; CUDA
Embedded Systems: Applying embedded systems principles; RTOS; serial; UART; SPI; I2C; memory mapped IO; ARM Assembly
Digital Design Lab: Design and implementation of digital systems; FPGA; Quartus; computer architecture; assembly; VHDL
Microelectronics: Semiconductor physics, PN junctions, carrier transport, BJTs, MOSFET operation, small-signal models
Circuit Analysis: Methods and principles of DC/AC circuit theory; RLC circuits; node/loop analysis; Thevenin and Norton theorems; superposition; op-amps; phasor and frequency response; Bode plots; Laplace transforms; two-port networks
Signals and Systems: Continuous-time linear systems and signals; mathematical representations; Fourier and Laplace transforms; convolution; input-output responses; stability
Electromagnetics: Fundamental electromagnetic field concepts; maxwells equations; transmission lines; EM waves; antennas
Analog Electronics: Biasing techniques, multistage and differential amplifiers, op-amp circuits, feedback, filters, oscillators

Publications

A. Marsh, S. Shah, A. Gajula, D. J. Hasler and A. Ige, "Extending and Validating High Level Synthesis Tools for Analog Computing on Field Programmable Analog Arrays," 2025 IEEE Opportunity Research Scholars Symposium (ORSS), Atlanta, GA, USA, 2025, pp. 1-4, doi: 10.1109/ORSS66051.2025.11121627.

Rachel Bowens-Rubin, Abraham Marsh, Phil Hinz, Caesar Laguna, Arjo Bos, et al. Performance of large-format deformable mirrors constructed with hybrid variable reluctance actuators III: laboratory measurements of dynamic behavior. Adaptive Optics for Extremely Large Telescopes 7th Edition, ONERA, Jun 2023, Avignon, France.

Extracurricular

Hive Makerspace | Peer Instructor, Machine Shop Specialist   *January 2023 – August 2025*
- Aid students with use of makerspace tools such as laser cutters, 3D printers, and wood working machines.
- Consult students on personal and academic projects to achieve desired outcomes and work around constraints of makerspace tools and design processes.

Kaiser High School | IB Physics Tutor   *January 2023 – Present*
- Tutor online between 3 and 6 IB Physics at Kaiser High School, one hour each per week.
- Average test improvement of 37% between first and final tutoring session.
- Prepared weekly lesson plans for each student, tailored to their individual needs and learning pace