

Aryan Mehrotra

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Work Experience

SpringLab, Embedded Systems Lab (ESL) - Northeastern University

August 2024 – Present

Research Assistant

Boston, MA

- Developed firmware for the PC821 FPGA using C++ to allow data collection across multiple input channels simultaneously.
- Implemented a multi-threaded double-buffered system which allows for continuous DMA receive from the ADCs and efficiently saves data without losing samples.
- Diagnosed and resolved performance limitations in data recording system by systematically testing binary and ASCII formats under different channel and burst size conditions, ultimately implementing a binary-based solution that accelerated data processing and storage.

VJ Electronix

July 2022 – February 2023

Software Engineering Intern

Chelmsford, MA

- Re-designed GUI interfaces in C# and Visual Basic to interact with new hardware and wrote custom plugins according to client specifications which helped them record data more efficiently.
- Programmed a web server with REST APIs and Node.js to allow for remote communication with VJ Electronix component counting machines and stored the results in MongoDB. The system was automated and interfacing directly with the client's component storage system which let them efficiently gather data on their inventory with minimal operator interaction.
- Co-designed a web app which was used as the main UI for a product which allowed the company to enter a new market segment. Developed the frontend design with React Native and implemented user authentication with OAuth 2.0. Created a relational database in PostgreSQL to store necessary information for the web app based off feedback from beta testers. The product prototype was demonstrated to potential customers at an exhibition in Las Vegas.

E Ink Corporation

July 2021 – January 2022

Electro-Optical Technician

Billerica, MA

- Designed and constructed a 3-axis stage for testing E Ink displays, incorporating a newly 3-D printed component to secure the measurement probe and minimize variability in measurement positions.
- Developed a Python interface to control the motors of the 3-axis stage, enabling precise movement commands. Conducted extensive accuracy testing to ensure motor calibration and prevent drift over prolonged testing periods. The interface allows users to move the display along the XY axis or adjust the measurement probe along the Z axis by specifying position values.
- Conducted spectroscopy and microscopy tests on display samples and provided validated data and summaries to the research, development, and production teams.
- Communicated with research, development and production teams on selecting the appropriate test suites for various ink runs, along with providing status updates on long term stress tests on displays. Advised members of the R & D team with troubleshooting specific samples in the event of faulty results.

Education

Northeastern University - Boston, MA

M.S. in Computer Engineering, GPA: 3.88

May 2024

- Selected Coursework: VLSI Design, Computer Hardware Security, Operating Systems, Software Security

B.S. in Computer Engineering and Computer Science, Major GPA: 3.79

June 2023

- Selected Coursework: Electronic Design, Computer Architecture, Computer Systems, Object-Oriented Design, Mobile Application Development, Algorithms and Data Structures

Skills

- **Programming:** C, C++, C#, Python, Verilog, Java, Matlab, JavaScript, Typescript, Swift, Assembly (x86, MIPS)
- **Applications and Frameworks:** VLSI Design, Vivado, PSpice, Cadence Virtuoso, MongoDB, PostgreSQL, Firebase, LaTeX, Vim, Git, Linux, Node.js, React, React Native

Projects

32-Bit Arithmetic Logic Unit (ALU), Academic Project

- Co-designed a 32-bit ALU with support for 7 operations using CMOS and pass-transistor logic in Cadence Virtuoso. Completed layout designs along with DRC and LVS for a portion of the schematics.
- Optimized transistor sizes and placement to achieve a 230 MHz critical path clock speed and a maximum power draw of 9 mW with a final load of 20 fF.