Alexander Aron

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EDUCATION

University of Florida   Gainesville, FL

M.S. in Computer Engineering   *(Expected) May 2027*
B.S. in Computer Engineering   *GPA: 4.0, May 2026*

Achievements:
- College of Engineering Dean's List: Spring 2023 & Fall 2024, University Scholars Program

Notable Coursework:
- Data Structures and Algorithms, Operating Systems, Microprocessors, Digital Design

EXPERIENCE

2x Software Engineering Intern   May - July 2024/2025
Home Depot   *Remote*
- Developed and maintained data pipelines using **BigQuery**, resulting in a 30% improvement in data processing efficiency and ensuring timely availability of analytics data for business decision-making.
- Collaborated with cross-functional teams to design and deploy scalable data solutions with the use of **Docker**, enhancing overall data infrastructure.
- Utilized **Python** to automate data validation, reducing manual data handling by 40%.

Teaching Assistant - Data Structures and Algorithms   August 2024 – December 2024
University of Florida   *CISE, Gainesville, FL*
- Led workshops on C++ data structures and algorithms: AVL trees, page-rank, hash tables and graphs
- Conducted code reviews that reduced errors and improved clarity
- Developed supplemental study materials and practice problems that reinforced lecture topics and improved student comprehension.

Teaching Assistant - Digital Logic and Computer Systems   January 2025 – May 2025
University of Florida   *ECE, Gainesville, FL*
- Hosted weekly lab sessions and office hours to support student understanding of digital design concepts
- Guided students through creating/debugging Block Design Files(BDFs) in Quartus and writing **VHDL** modules
- Proctored exams and assisted in grading to ensure fair assessment and timely feedback

Undergraduate Research Assistant   January 2023 – Present
University of Florida   *Engaging Learning Lab, Gainesville, FL*
- Utilized **Rust** and **WASM** to develop a dual-modal code editor targeted towards beginner programmers
- Assisted in the finalization of research paper focused on compiler usage in CS exams
- Found a significant improvement of over 10% in compile-and-run scores through the analysis of data comparing pseudocode and compile-and-run exams

PROJECTS

32-bit MIPS Processor | *VHDL, Quartus Prime, ModelSim, Git*   January 2025 – May 2025
- Designed and implemented a 32-bit microprocessor in VHDL with a custom instruction set inspired by MIPS architecture.
- Built datapath and control units from scratch, supporting arithmetic, memory, and branching instructions.
- Simulated processor behavior using ModelSim and verified functionality with provided assembly test programs.
- Integrated components including ALU, register file, memory, and FSM-based controller into a complete working CPU.

Lilypad | *Rust, WASM, VScode, Git, Python, C#, Java*   March 2023 – Present
- Developed a next generation dual modal code editor that currently supports **Python**, **Java**, and **C#**
- Integrated tree-sitter into Lilypad to enable real-time parsing and syntax highlighting for **C#** and **Rust**, extending editor capabilities through custom grammar bindings.
- L. Rosenfeld and J. Blanchard, "Beyond Blocks: Lilypad, a Text-Based Visual Code Editor," in 2023 IEEE Symposium on Visual Languages and Human-Centric Computing (VL/HCC), Washington, DC, USA, 2023

Microcontroller Piano | *C, AVR Microcontroller, DAC, DMA, Timers, Interrupts, USART*   November 2024
- Programmed an AVR microcontroller to generate analog waveforms using a DAC and lookup tables.
- Used DMA to transfer waveform data to the DAC, reducing CPU usage and enabling real-time audio.
- Generated sine and decay waveforms to produce musical tones at varying frequencies.
- Leveraged timers, interrupts, and USART to control tone changes from keyboard input.
- Validated waveform voltage and frequency with an oscilloscope.

TECHNICAL SKILLS

Languages: System Verilog, VHDL, Rust, Python, C/C++, Java, HTML, C#
Developer Tools and Frameworks: Git, React, Node.js, Django, WASM, BigQuery, SQL, Tailwind, Docker, Quartus