Samuel I. Peterson

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EDUCATION

Georgia Institute of Technology **Atlanta, GA**

Bachelor of Science in Computer Science **Expected Graduation: May 2027**

GPA: 4.0 / 4.0

Courses: Operating Systems, Computer Architecture, Data Structures & Algorithms, Databases

SKILLS

Programming Languages: C/C++, Rust, Java, SQL, Python, HTML/CSS/JS, Verilog

Tools & Frameworks: Git, Jira, Confluence, GDB, OpenOCD, Visual Studio, Eclipse, Node.js, GNU, Linux, OpenGL

Embedded Systems: STM32 HAL, SPI, I2C, UART, PWM, DMA, JTAG, Device Drivers, FreeRTOS, ARM

Other: HTTP, TCP/IP, UDP, RESTful API, Machine Learning, Computer Architecture, FPGA

EXPERIENCE

Georgia Tech Ramblin' Rocket Club, *Lead GNC SWE* **Aug 2024 – Present**

- Utilized **FreeRTOS stream buffers**, **mutexes**, and **semaphores** to implement flight software for an actively stabilized rocket, achieving a telemetry **latency of 3ms**; published results at the **AIAA** Student Conference
- Developed a hardware-agnostic driver library for sensors and actuators utilizing the **STM32 HAL** library, **SPI, I2C, UART**, **PWM,** and **DMA**, enabling flight software to run seamlessly on new hardware
- Debugged software using logic analyzers, oscilloscopes, **OpenOCD**, **GDB**, and hardware-in-the-loop testing

Quality Bicycle Products, *WMS Developer (Contractor)* **May 2025 – Present**

- Led implementation and redesign of all integrations (SAP, labor management, cartonization, etc.) for a total rewrite of Warehouse Management System (WMS) software, supporting the processing of **10K**+ orders per day
- Modernized the WMS by implementing new **REST API** integrations in **SQL**, improving cartonization efficiency and enabling paid labor incentives for warehouse employees

Quality Bicycle Products, *Data Scientist (Contractor)* **Jun 2024 – Aug 2024**

- Trained an **XGBoost** machine learning model to forecast daily warehouse shipments up to *twelve weeks ahead* with an average of **5% error**, replacing legacy forecasting methods and improving employee scheduling efficiency

PROGRAMMING PROJECTS

Marlin Programming Language **Jun 2024 – Present**

- Designed a **compiler, interpreter,** and **virtual machine** for a custom statically-typed programming language targeting a custom load-store instruction set architecture with dedicated instructions for text I/O
- Developed a **linker** to place strings, constants, and functions into known memory locations

Distributed RGB LED Controller **Jun 2024 – Present**

- Developed a **multithreaded web server** using **Axum** in Rust using **cooperative scheduling** with the **Tokio** asynchronous runtime for controlling real-time RGB effects and parameters across any number of devices
- Leveraged a multithreaded **producer-consumer queue** pattern, asynchronous traits, and closures to communicate with each device independently while maintaining synchronization across device latencies between 10-100ms
- Utilized the **Fast Fourier Transform** and **TCP sockets** to synchronize effects with music and external events

CarlSIM Chess Bot **Mar 2022 – Mar 2023**

- Implemented zobrist **hashing**, alpha-beta pruning, transposition tables, magic bitboard hashing, **bitwise operations**, and **inline assembly functions** to optimize search efficiency, exploring up to **10M** positions/second
- Achieved performance **exceeding FIDE Master-level opponents** in testing (2300+ rating, top 1% of humans)