Benjamin Scholar

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SUMMARY

I am a self-motivated Computer Engineering graduate with a long-time passion for all things technology and programming, including experience and experimentation with hardware design, embedded software, and real-time applications.

EDUCATION

Case Western Reserve University **September 2019 - August 2023**
Bachelor of Science in Engineering, Computer Engineering *GPA: 3.8*

- Secondary Major in Computer Science
- Magna Cum Laude
- Relevant Coursework: Data Structures, Algorithms, Operating Systems, Compiler Design, Computer Architecture, Digital System Design, Embedded Systems, VLSI/CAD, FPGAs, Modern Robot Programming, Computer Networking

PROFESSIONAL EXPERIENCE

Case Western Reserve University **Cleveland, OH, USA**
Undergraduate Teaching Assistant *January 2023 - June 2023*

- Taught undergraduate students concepts including hardware design principals, hardware description, validation, and simulation.
- Supported students in the lab portion of the course and graded submissions.

Abbrea Capital **Sausalito, CA, USA**
Data Science Intern *June 2020 - September 2020*

- Utilized machine learning techniques to analyze patterns in positions held by hedge funds.
- Became familiar with PyTorch, TensorFlow, OpenAI gym, XGBoost, and related tooling.
- Gained experience with project management and data analysis.

Monkey Business Camp **Berkeley, CA, USA**
Counselor/Site Director *June 2016 - August 2023*

- Ran summer camp groups consisting of 20+ children ranging from 5 to 10 years old.
- Played a key role in coordinating camp activities, organizing staff, and handling parent communication.
- Assisted younger staff members and youth leaders (11-16 years old) develop organizational and leadership skills.

PROJECTS & LEADERSHIP

FRC Team 5419 Mentorship
Programming and Control Systems Mentor *2023 - Present*

- Provide guidance for a high school robotics team competing in the FIRST Robotics Competition.
- Educate students in the areas of programming basics, software structure, software engineering workflows, elementary control theory concepts, and engineering design principals.

CWRUBotix - NASA Robotic Mining Challenge
Software/Firmware Developer *2019 - 2022*

- Developed software for Case Western Reserve's entries into the NASA Robotic Mining Challenge using Python and C++.
- Assisted in development of the autonomous capabilities of the robot, including the obstacle avoidance and localization systems.
- Designed and programmed multiple CAN enabled sensor boards utilizing embedded ARM microcontrollers and real-time operating systems (RTOS). Developed communication between sensor boards and main computer.

Hardware Team Lead *2021 - 2022*

- Led a team of 5+ undergraduate students, managed finances/inventory, and coordinated between other sub-teams.
- Designed, manufactured, and programmed custom PCBs necessary for our robot's control system.
- Gained experience in PCB design, ARM microprocessors, embedded programming in C/C++/Rust, and project management.
- Furthered my experience with communication protocols such as I2C, SPI, CAN, Ethernet, and UART.

Capstone Project - Autonomous Tennis Ball Collection Robot
Team Member *Fall 2023*

- Developed firmware and software to control a robot capable of autonomously collecting loose tennis balls from a tennis court.
- Robot was able to collect tennis balls and return them to a collection area successfully within the simulator.
- Large emphasis on project management, documentation, and communication.
- Gained knowledge in the areas of OpenCV, Robot Operating System, Kalman filtering, and simulation.

Hardware Design Projects
Student *2020 - 2023*

- Implemented a wide range of RTL designs including a recursive conditional-sum adder and various multipliers/dividers.
- Implemented and verified more complex designs including CPU caches, a synchronous serial port, and a RISC-V processor.
- Reinforced ability to design and implement complex hardware using Verilog, SystemVerilog, and VHDL
- Gained elementary experience with synthesis tools and deployment to FPGAs.
- Designed and implemented Verilog parser and zero-delay circuit simulator in C++.

SKILLS

Programming Languages: Rust, C/C++, Python, Java, Kotlin
Hardware Description/Verification: Verilog, SystemVerilog, VHDL, Quartus, QuestaSim, Mentor ADK, Synopsys/VCS
Development Tools: Gradle, Bazel, CMake, Git, Bash/ZSH, GTest, JUnit, Docker, Debugging (GDB), OpenOCD
Operating Systems: Linux (Fedora, Debian, Ubuntu, Arch), Windows, MacOSX
Misc: Altium Designer, Microsoft Office, LaTeX, Oscilloscope, Digital Logic Analyzer