# MICHAEL ORSCHELN

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## PROFESSIONAL SUMMARY

Computer Engineer with a strong foundation in hardware and software engineering, particularly embedded systems, electronics and computer architecture. Hands-on experience with programming microcontrollers, sensors, digital systems design and developing software solutions. Skilled at understanding and analyzing complex problems to develop and implement innovative solutions. Proven ability to collaborate effectively with cross-functional teams to drive project success. Known for strong people skills and a natural drive to make connections, fostering a cheerful and productive work environment. Committed to continuous learning and professional development, with a passion for integrating technology to create cutting-edge products that make an impact.

- C & C++ Programming
- Embedded Systems
- Hardware Design
- Robotics
- Software Development
- Linux & Unix
- Adaptability
- Team Collaboration
- Problem-Solving

## OVERVIEW OF KEY ATTRIBUTES

- **Embedded Systems |** Well-versed in programming and debugging real-time operating systems with microcontrollers such as ARM STM32, PIC32 and Arduino. Strong understanding of fundamentals like memory performance, clocks, CPU architecture, interfaces, communication protocols (AHB, APB, AXI, UART, SPI, I2C, VGA, Ethernet) and more
- **Software Development |** Versatile in all levels of software including programming using assembly language programming, high-level language programming (C, C++, Python, Java) to design applications and optimize performance with algorithms
- **Hardware Design |** Experienced in ASIC, SoC, FPGA RTL design, simulation, and verification in Verilog and VHDL using Xilinx Vivado and Intel Quartus
- **Robotics |** Lead design and integration of localization subsystem for robotics competition by using sensor data with ROS through the Linux OS. Experience building and scripting custom ROS driver to interpret sensor data for real-time robot positioning via SLAM (Simultaneous Localization and Mapping). Used Kalman Filter to improve accuracy of yaw, pitch, roll angles and orientation

## PROFESSIONAL EXPERIENCE

**Repario |** ***Remote*** **May 2023 – August 2023**
**Digital Forensic Intern**

- Analyzed digital evidence, from various devices including 9 different forensic tools, for contribution in litigation
- Delivered 2 forensic examination reports for use as admissible evidence in court
- Automated the processing of 1030 GB of forensic data to improve eDiscovery throughput
- Collected and or prepared 4776.32 GB of data for delivery to attorneys

**SALTO Systems |** ***Oiartzun, Gipuzkoa, Spain*** **June 2022 – August 2022**
**Project Management Intern**

- Identified 3 Apple Wallet cross-functional pain points and revised product roadmap supporting successful launch of new platforms
- Designed onboarding courses delivered to 64 global business units reducing onboard load by 45% thus driving sales performance and growth into new markets
- Supported cross-functional team collaboration for integration of 3 different product lines, working closely with technical managers from SALTO and Apple Inc to improve business alignment

**Charter Capital Management, Inc. |** ***Boston, MA*** **May 2021 – June 2021**
**Associate Intern**

- Developed fully responsive website with analytical tools resulting in a 152% increase in organic search traffic
- Evaluated real estate investment projects using comparative and cash flow analysis supporting 10 acquisitions with total valuation of $233 million
- Reduced market research workload for residential property acquisitions by 75%

## PROJECTS

**Robotics Localization Lead |** ***IEEE SoutheastCon Hardware Competition*** **August 2023 – March 2024**

- Engineered fully autonomous robot with the ability to complete a series of tasks to send supplies to space
- Worked closely alongside 5 team members to integrate the drive train, power, and edge computing subsystems to be used in Robot Operating System (ROS)
- Lead localization subsystem which helped the robot understand its position and orientation by using gyroscope and accelerometer sensor data interfacing with NVIDIA Jetson Nano. A Kalman Filter and other mathematical models improved data accuracy to be within 1 degree for all 3 axis (yaw, pitch, roll)

**FPGA-Based Designs |** ***Digital System Design*** **August 2023 – December 2023**

- Created a snake game using the Basys3 board featuring VGA interface for display output and pushbutton controls with debouncing routines. Configured onboard oscillator for proper pixel clock to drive VGA signal, ensuring each pixel is displayed at the correct time and within the frame
- Pipelined a multiplier/adder data path to improve performance by adding pipeline registers.
- Designed a UART receiver and transmitter supporting multiple baud rates, 8 data bits, 1 start bit, and 1 stop bit, with framing and overrun error detection. Implemented status and control registers for managing data reception and simulated using custom test benches and ModelSim.

**Embedded Light Intensity System |** ***Microcomputers*** **November 2022 – December 2022**

- Programmed PIC24 microcontroller to sample analog voltage inputs from a photocell every 50 milliseconds, using a 32-bit timer-driven interrupt to control input sampling and 8-bit light intensity variable

**EcoCAR |** ***University of Alabama*** **November 2020 – April 2021**

- Utilized MATLAB and Simulink to simulate energy efficiency of the team's modified 2019 Chevy Blazer
- Designed energy consumption plan to test 4 drive cycle variations and proposed strategy to technical team leads

## EDUCATION

Bachelor of Science (BS) Computer Engineering | **University of Alabama**
Minor in Computer Science, Mathematics & Spanish

- Embedded Systems
- Digital Systems Design
- Digital Logic
- Electric Networks
- Electronics I & II
- Theory of Probability
- Linear Algebra
- Data Structures & Algorithms
- Software Engineering & Design

## SKILLS

**Proficiencies |** C++, C, Assembly, Java, Python, Javascript, Typescript, HTML, CSS, React, MATLAB, Object-Oriented Programming, Verilog, VHDL, Xilinx Vivado, Intel Quartus, FPGA, ASIC, SoC, ROS, Cadence OrCAD, Git, Jira, Docker, Microsoft Office (Word, Excel, PowerPoint), Adobe Photoshop
**Frameworks |** React, Chakra-UI, NextJS, TailwindCSS
**OS |** Linux, Unix, MacOS, iOS, Windows, KaliLinux
**Languages |** English, Spanish
**Other |** Bash, x86, ARM, MIPS, Agile, Visual Studio