Matthew Julian Haahr

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EDUCATION

Worcester Polytechnic Institute (WPI), Worcester, MA — May 2023
Bachelor of Science in Robotics Engineering, Minor in Computer Science - 3.95 GPA - High Distinction

SKILLS

Languages: C/C++, Python, MATLAB, BASH, Java, Racket (Scheme), LaTeX, x86 and ARM Assembly, ABB RAPID
Software Tools: Git/GitHub, KiCAD, SolidWorks, Fusion360, ROS, BASH, RTOS, MacOS, Linux, Windows
Hardware Tools: Soldering, Multimeter, Logic Analyzer, Oscilloscope, 3D Printer, Laser Cutter
Hardware: ARM Cortex M (STM32, Raspberry PI RP2040, TI M4), AVR/Arduino, ESP32, TI MSP430, Artix-7 FPGA

EXPERIENCE

Embedded Software Engineer I, Certus Critical Care, Sacramento, CA — June 2023 - Present

- Certus Critical Care is developing smart medical devices to help improve quality of life and care for critically ill and injured patients while reducing the load on physicians
- Developing firmware to control and operate advanced and novel medical devices as well as creating prototype hardware and PC applications to de-risk and prove the functionality of the devices

Student Assistant, WPI Robotics Engineering Department, Worcester, MA — August 2022 - May 2023

- Lead labs and held office hours to support students in Unified Robotics III (Robot Kinematics) and IV (Autonomous Navigation)
- Helped students implement and understand concepts including Forward and Inverse Kinematics, Trajectory Planning, Image Processing, Mapping, Localization, ROS, Simulation, and using a Linux Shell

Lead Instructor, BlueStamp Engineering, Palo Alto, CA — June 2022 - August 2022

- Taught high school students the practices and principles of engineering including soldering, Arduino, Raspberry Pi, OpenCV, CAD, and troubleshooting using multimeters and oscilloscopes
- Helped students select, design, and create functional prototypes of robots, IoT devices, facial recognition, prosthetics, smartphone-enabled door locks, and many more

Undergraduate Researcher, Robotic Materials Group, Worcester, MA — December 2020 - December 2021

- Researched cheap and easy fabrication of complex circuits by prototyping inkjet printed circuits on lightweight and foldable materials and taught a graduate student lab about the work by combining circuits printed on paper with off-the-shelf electronic components to blink an LED
- Assembled and used a FlowIO Device, a miniature pneumatics toolkit for control and sensing of Soft Robotics and Programmable Materials, to characterize soft-bistable valves

Firmware Engineering Intern, Kioxia, San Jose, CA — June 2021 - August 2021

- Developed debug tools written in Python to interpret and analyze logged telemetry data from XD6 drives

PROJECTS

RGB LED USB Hub, San Francisco, CA — August 2023 - March 2024

- A 3-Port USB Hub with Integrated Microcontroller and RGB USB-A Ports.
- Utilizes a TI TUSB2046 4-port USB hub controller, Raspberry Pi RP2040, and a 4-layer PCB with impedance-matched differential traces for a correct implementation of USB.

Robotic Ecosystem for Monitoring Climate Change, WPI, Worcester, MA — August 2022 - May 2023

- Developed an untethered underwater glider using soft, fluidic, closed-loop buoyancy control to increase distance traveled while operating close to the surface.
- Designed the electronic system and necessary device firmware to collect important measurements of pressure, temperature, and more using affordable sensors and hardware
- Accepted as a conference publication to the IEEE/RAS RoboSoft 2023 Conference.
K. Bonofiglio et al., ”Soft Fluidic Closed-Loop Controller for Untethered Underwater Gliders,”