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Wilson J. Holmes

Computer Engineer / Robotics Developer / Team Leader

GitLab: wilsonjholmes
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I am a Computer Engineer who is passionate about robotics and surgical innovation. I am fluent in GNU/Linux and many programming languages. I have created programs with python and C/C++ for embedded devices and robots/gazebo simulations using ROS middleware. Recently, I saved our research group tens of thousands of dollars by building custom hardware, electronics, and developing software for open-source bioreactors. I have used static/dynamic analysis tools like GDB to debug projects locally and remotely, and have experience working with Valgrind to identify memory management issues. I am familiar with agile software development methodologies like Scrum and Kanban (like Jira) and use version control tools like git, GitHub, and GitLab for both personal and team projects. I am excited to bring my innovative skills and teamwork to the team.

Education

Bachelor of Science in Computer Engineering, *Michigan Technological University, Houghton, MI* — Graduated Fall 2021
3.56 cumulative GPA, Cum Laude

Early College Program (53 credits while in high school), *Northwestern Michigan College (NMC)* — Fall 2016 — Spring 2018
Dean's List every semester

Manufacturing Technology Academy (MTA), *Traverse City, MI* — Fall 2015 — Spring 2017
Achieved the Career Tech Center Principal's Honor Roll every semester

Dual Enrollment: Buckley High School/ Home School, *Buckley, MI* — Graduated Spring 2017
GPA: 4.0

Skills

Software Tools	GNU/Linux, Robot Operating System (ROS), GDB, Valgrind, git, GitHub, GitLab, OpenCV, CI/CD
Programming Languages	C/C++, Python, Java, MATLAB, BASH, LaTeX, MarkDown, HTML, CSS, JS, (learning Rust)
Technical	Electronics design (SMD, THT), 3D printer building, Arduino, Nios II, I2C, SPI, UART

Technical Experience

Research Lab Assistant / Developed open-source software and hardware: — **Fall 2019 — Fall 2021 (Paid)**
Michigan Tech's Open Sustainability Technology (MOST) Lab, Led by Dr. Joshua Pearce — *Houghton, MI*
- I implemented pH control on the chi.bio bioreactor system for use in the Plastic-to-Food DARPA-funded project.
- Built and operated chi.bio bioreactor units using BeagleBone single-board computers with Debian GNU/Linux.
- Modeled and 3D printed parts for retrofitting bioreactors using code-CAD programs like OpenSCAD.
- Used python, Qt, flask, JS, OpenSCAD, Bus Pirates, among other open-source software and hardware tools.
- Designed open-source parts and control software for a cost-effective tig-based metal 3D printer for Dr. Shane Oberloier.
- Co-authored and collaborated on doctoral research with Dr. Shane Oberloier.

President and Software Lead of the Open Source Hardware Enterprise (OSHE) — **Spring 2020 — Fall 2021**
Michigan Technological University — *Houghton, MI*
- Created a web interface for an open-source autonomous agricultural robot, using HTML, CSS, JavaScript, and Python
- Wrote CLI and TUI tools for the robot, as well as a full gazebo simulation using ROS Noetic, ArUco tags, and OpenCV
- Lead contributor to the organization's open-source code base on GitHub

Material Handling Intern / Working with 2D and 3D robot vision — **Summer 2020**
FANUC America Corporation (FAC) — *Rochester Hills, MI*
- Replicated sensor firmware bugs found by customers and tested fixes for them.
- Developed and documented an accuracy testing procedure for iRVision's calibration.
- Edited user documentation (served via a static site) using HTML, CSS, and JS.

Robotic Systems Enterprise (RSE) — **Summer 2019**
Michigan Technological University — *Houghton, MI*
- Built, and programmed a GNU/Linux based, ROS enabled robot (Turtlebot3 by Robotis)

CAD Detailing/ Machine Operator Intern — **Summers 2016 — 2018**
Verified Path Machining (VPM) — *Elk Rapids, MI*
- Reverse engineered piling components using optical comparators, CAD software, and other instruments. Operated CNC Lathes.

CAD Detailing Intern — **Summer 2017**
Integrated Controls Incorporated (ICI) — *Traverse City, MI*
- Digitized electrical schematics/prints using AutoCAD.
- Worked alongside electricians assembling control panels for wastewater treatment facilities and power plants.

Leadership and Service Work

I run the soundboard, play ukulele, acoustic and electric guitar, and sing at my church on Saturdays and Sundays — 2016 — 2021
MTU Broomball Team Captain of "Just Yote It!" — Spring 2020
MTU Undergraduate Student Government Food Quality Representative — Fall and Spring 2019