Zaid Hoda

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Education

University of Calgary September 2022 – April 2027
Bachelor of Science in Electrical Engineering, Minor in Mechatronics Engineering *GPA: 3.5/4.0*

Coursework: *Computer Architecture, Digital Systems, Control Systems, Communications and Networks, Mechatronics*
Awards: *Dean's List, Jason Lang Scholarship, SSE Summer Research Award*

Skills

Programming Languages: C/C++, Python, SystemVerilog, HTML/CSS, JavaScript
Software and Tools: KiCad, Altium Designer, LTSpice, Multisim, Xilinx Vivado, Linux, GitHub, ROS 2
Hardware and Embedded Systems: FPGAs, microcontrollers (Arduino, Raspberry Pi, ESP32, PIC24), soldering

Experience

Schulich School of Engineering | ***Machine Learning Research Assistant*** January 2025 – present
- Developing a prosthetic device to emulate finger movements at the HERO lab under Dr. Junho Park.
- Conducted an in-depth literature review on existing research, investigating machine learning methods for prosthetic design including reinforcement learning and neural networks.
- Performed data analysis in **Python** on forearm EMG signals using libraries such as **NumPy** and **pandas.**

CalgaryToSpace | ***Electrical Subteam Member*** January 2024 – present
- Contributed to the design, assembly, and testing of **7+** circuit boards for Calgary's first student-made satellite, utilizing **KiCad** and **Altium Designer** for PCB design and implementing custom testing and troubleshooting procedures to ensure device safety and functionality.
- Developed an **Arduino** program in **C++** to interface a load tester for the solar panels used by the satellite, reducing testing time by approximately **90%**.
- Trained new members in Arduino/C++ and circuit board testing, improving team efficiency.

Schulich School of Engineering | ***Electrical Engineering Research Intern*** May 2024 – August 2024
- Worked on the development of an assistive humanoid robot for the City of Calgary under Dr. Henry Leung at the Autonomous Systems and Intelligent Sensing Laboratory.
- Implemented 7 custom **ROS 2** packages for real-time data processing using a Hokuyo UST-20XL laser scanner, enabling mapping and navigation functionality for the robot.
- Wrote **Arduino C++** code to interface an MPU6050 gyroscope/accelerometer with an Arduino ESP32 Wroom.
- Developed a ROS 2 pipeline to convert serial data into structured ROS 2 IMU messages.
- Diagnosed and troubleshooted network issues concerning the robot's laser scanner and its Ethernet interface.
- Administered **version control** and general organization by maintaining a **GitHub** repository for the project as well as technical documentation to ensure clarity and reproducibility for future users.

Projects

TrashAuto January 2025 – present
- Serving as the project manager and technical architect for the development of an outdoor garbage collection robot.
- Developed software for the navigation system in **C** using a **PIC24** microcontroller, incorporating predefined paths, obstacle avoidance, and events for garbage detection and collection.
- Interfaced a **Raspberry Pi** with the PIC via **I2C** in a master-slave configuration, allowing for seamless data transmission between the robot's machine learning model and navigation system.

F1 Reaction Time Game January 2023 – April 2023
- Collaborated with a team of four to engineer a handheld F1 reaction time game powered by an Arduino Uno.
- Wrote **Arduino C++** code and developed circuitry to interface an MPU6050 accelerometer. Authored a comprehensive technical report on the design process of the project and received a grade of **100%**.