Max Guo

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EDUCATION

University of British Columbia   Vancouver, BC
Bachelor of Applied Science Electrical Engineering   *Expected Graduation May 2027*

WORK EXPERIENCE

Firmware Engineer Team Member   Jan 2025 – Present
UBC Open Robotics   *Vancouver, BC*
  * Utilized ROS 2 to configure a GitHub repository in Linux for sensor driver implementation, enabling seamless integration and version control.
  * Simulated firmware in Gmock to benchmark multiple IMUs to determine which IMU best fits hardware specifications

3D Model Designer   June 2023 – September 2023
Open Gate Architectural Scale Models   *Vancouver, BC*
  * Designed industry-level 3D models of miniatures using Sketchup and AutoCAD, adhering to project requirements and design specifications
  * Troubleshot and resolved modelling issues to ensure proper 3D printing

TECHNICAL PROJECTS

Self-Balancing Inverted Pendulum Robot | *C, Micro-controller, Circuit Assembly*
  * Built real-time firmware with FreeRTOS on an ESP32, integrating parallel processing and priority scheduling across a dual-core system to keep operations fast and responsive
  * Programmed an Arduino Nano in C to implement steering control for a self-balancing two-wheeled robot through the use of embedded IMU and a PID controller
  * Designed and 3D-printed a self-priming catapult mechanism in OnShape to challenge robot balance
  * Created a multi-MCU architecture with an Arduino Nano dedicated to IMU data processing and PID balancing, while an ESP32 handled sensor integration and motor control, synchronized via UART communication

RC Metal Detecting Robot | *C, Micro-controller, Circuit Assembly*
  * Collaborated in a four-person team to design a metal detecting robot, leveraging inductance to detect likeliness of metallic objects
  * Designed transmitter and receiver circuits, integrating a JDY-40 UART radio module, H-bridges, octocouplers, and LCD displays
  * Programmed microcontrollers in C, integrating master-slave radio communication, custom timers, and metal detection signal processing for smooth response between controller and robot

RISC CPU MACHINE | *Verilog, Quartus, ModelSim*
  * Wrote Verilog code for various modules of a RISC, including a register file, ALU, IF, and finite state machine controller
  * Ensured correctness of each module by designing and running testbenches in Modelsim

SumoBot | *Welding, Prototyping, Circuit Design*
  * Led a team of four in building a SumoBot that won first place in a competitive tournament
  * Coordinated closely with team members to brainstorm and prototype various concepts, guaranteeing compliance with restrictive competition guidelines
  * Refined upon mechanical design concepts including possible gear ratios to maximum torque efficiency, and exterior design most suitable in maintaining upright position

TECHNICAL SKILLS

Software: Altium, SolidWorks, Quartus, Github, Onshape, Linux, LTSpice
Language: Java, Python, C/C++, SystemVerilog, Assembly, MATLAB
Electrical: Circuit Design, Debugging, Schematic Implementation, Analysis, Simulation, Multimeter, Soldering, Arduino, Datasheet