David Hsiao **Electrical Engineering Student**

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TECHNICAL SKILLS

Languages
- C
- SystemVerilog
- Assembly

Computer Tools
- Onshape
- Matlab
- Arduino

Electronic Instruments
- Multimeter
- Oscilloscope
- Signal generator
- Soldering iron

EDUCATION

University of British Columbia **Expected Graduation: May 2026**
Bachelor of Applied Science - Electrical Engineering

TECHNICAL PROJECTS

RC Magnetic Field Controlled Robot, UBC **March 2023 – April 2023**
- Acquired knowledge of technical skills: electronics principles, servo, RC transmitter, mosfet H-Bridges, amplifier, peak detector, LPC824, PIC32, and EMF8
- Developed a magnetic field-controlled car using EFM8 microcontroller for the robot and LPC824 for the transmitter, powered by 4 AA cells and a 9V battery.
- Command mode allows the robot to receive instructions through the magnetic field from the controller and execute them accordingly.
- Tracking mode maintains a fixed distance from the magnetic transmitter and holds its heading, but limited to a distance of 50cm and transmitter must be positioned in front of the car.
- Joystick for ease of car control and LCD screen displays options such as stop, left and right turn, forward and backwards.
- A report was created that details the engineering process, including diagrams, blueprints, programming code in C and ARM, analysis, objectives, and enhancements.

Reflow Oven Controller, UBC **February 2023 – March 2023**
- Programmed in assembly language for Reflow Oven Controller software.
- Implemented temperature measurement using K-type thermocouple with cold junction compensation, capable of measuring temperatures between 25oC and 240oC.
- Developed a Reflow Oven Controller that regulates power delivered to a standard toaster oven using a solid-state relay (SSR) through any method, such as Pulse Width Modulation (PWM).
- Built a user interface with selectable reflow profile parameters, an LCD display for temperature and process state feedback, and a Start/Stop pushbutton independent of system reset.
- Created temperature strip chart plot through serial port for real-time feedback about the reflow process.
- Utilized Reflow Oven Controller to assemble EFM8 PCBs with a toaster oven and SSR.
- A comprehensive report was produced that encompasses the entire engineering process, covering diagrams, plans, ARM, C, and Python programming code, analysis, objectives, and improvements.

Measuring Temperature, UBC **February 2023 – February 2023**
- Interfaced the AT89LP51RC2 microcontroller with SPI devices and used the serial port to connect it to a computer for data exchange.
- Measured temperature using the LM335 sensor and performed 32-bit unsigned arithmetic operations using a pre-existing assembly language library.
- Utilized Python scripting to visualize the measured temperature with a plot, and simultaneously display the measured temperature data in degrees on both an LCD screen and the PUTTY terminal.

Potato Machine CPU, UBC **November 2022 – December 2022**
- Developed a synthesizable System Verilog datapath, controller FSM, and testbench to perform addition, multiplication, and operand shift operations on two values stored in RAM.
- Designed a controller FSM to manage the decoder and datapath, execute ISA instructions, and control the program counter, instruction register, data address register, and memory.
- Implemented a register file in the datapath to store and manipulate register values according to the Move, ALU, and memory instructions.

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VEX Robotics Tower Takeover, Heritage Woods Secondary School **September 2020 - January 2021**

- Designed and constructed a robot that can pile up and transport multiple 3-inch cubes.
- Used Onshape to model structures, 3D prints high-strength sprockets, and shear steel components to size.
- Created a tank tread drivetrain with medium intake flaps and a cube stockpiler mechanism.
- Documented the engineering process in a journal containing drawings, designs, code, analysis, goals, and improvements.

PROFESSIONAL EXPERIENCE

Master Badminton Club, Coquitlam, BC **June 2021 – Present**
Badminton Coach

- Provided guidance, instruction, and encouragement to students in a badminton program.
- Worked with parents and other coaches to develop the fundamental badminton skills necessary for students to compete effectively.
- Cultivated strong communication skills and fostered positive relationships with parents, students, and coaches to create an engaging training environment.
- Demonstrated leadership, problem-solving, and communication skills to effectively manage players, coaches, and parents and ensure a positive and safe experience.

Mirco Com System, Burnaby, BC **July 2023 – Aug 2023**
Document Digitization Operator/QC Inspector

- Prepping documents for scanning.
- Examine the scanned data for readability and ensure it meets customer satisfaction in terms of quality.
- Assist employees in addressing customer inquiries and offer additional support as needed.

ENGINEERING STUDENT TEAMS

AgroBots UBC - Chassis and Powertrain team, UBC **May 2023 – Present**

- Conduct research on step motors.
- Carry out extensive testing of step motors.
- Evaluate the control methods of step motors.
- Create documentation related to the research and testing conducted.

VOLUNTEER EXPERIENCE

Red Sales Representatives, Vancouver, BC **October 2023 – Present**
University of British Columbia Engineering Undergrade Society

- Take on the responsibility of aiding in the management of Red Sales operations.
- Support the Red Sales Director in maintaining store hours and promoting merchandise.

Garden Representatives, Vancouver, BC **September 2023 – Present**
University of British Columbia Engineering Undergrade Society

- Maintain and upkeep the ESC garden.
- General planting, planning, and managing the compost bin.

PROFESSIONAL AFFILIATIONS

EGBC **2021 – Present**

INTERESTS & ACTIVITIES

- UBC Go Club, Canadian Go Association
- Badminton, Badminton Canada
- Robotics