Shay McKim *Mechatronics Engineering - Varsity Athlete*

Personal Portfolio smckim@uwaterloo.ca linkedin.com/in/shaymckim

Skills

Software: C++, Python, VHDL, JavaScript, HTML/CSS, Java, LLM Integration, Arduino IDE, Git
Hardware: Arduino, Microcontrollers, Motor Control, Sensor Integration, PCB Design, UART, I2C, PWM, GPIO, PLC, FPGA
Design Tools: Fusion 360, SolidWorks, AutoCAD
Manufacturing: 3D Printing (FDM), CNC Machining, Design for Manufacturing
Certifications: Google Project Management Certificate, Lean Six Sigma Yellow Belt

Education

University of Waterloo, *Mechatronics Engineering* Sep 2024 – Current
- Varsity Men's Volleyball Team member balancing 30+ hours/week of high-performance training with engineering coursework. Built strong teamwork and communication skills through strategy meetings focused on KPIs and team performance.

Work Experience

CAD Electrical Technologist, *Manitoba Liquor and Lotteries - Crown Corp.* May 2025 – Aug 2025
- Independently updated AutoCAD electrical and fire alarm drawings for 2 multi-floor casinos and 60+ retail stores, improving drawing accuracy for maintenance and renovation firms.
- Interpreted handwritten electrician markups and collaborated with electricians and architects to resolve layout and circuiting discrepancies using layers and Xrefs, maintaining drawing standardization.
- Compiled 21 data points across 60+ stores, producing a tool that streamlined project prioritization for senior management.

Web Scheduling Application Developer, *PolySense - Mechatronics Startup* Jun 2024 – Sep 2024
- Developed a web-based scheduling tool (HTML, CSS, JavaScript, FullCalendar.js) enabling clients to book equipment and track usage directly through PolySense's site.
- Improved equipment coordination by enabling clients to visualize usage trends and manage bookings, optimizing lab space and machine availability.

E-Commerce Founder, *3D Printed Product Design & Manufacturing* Mar 2020 – Jan 2022
- Designed, iterated, and manufactured custom products using Fusion 360 and FDM 3D printing, delivering tailored solutions through small-batch production.
- Managed printer maintenance, troubleshooting, design, customer service, and shipping, achieving 800% ROI and 5-star customer rating.

Selected Projects

Algorithm Controlled 4-Axis Robotic Arm, *Unbeatable Game Opponent*
- Designed a cost-constrained 4-axis robotic arm optimized for FDM printing using Fusion 360; created 10+ custom components and C++ firmware to coordinate 5 servos with ±5 mm positioning accuracy.
- Built a Python minimax algorithm to compute optimal moves and transmit decisions over serial, interactive matches.

Automated Culinary Robot, *Full-Stack Team Leadership*
- Coordinated a 4-member team to deliver a fully integrated pudding-preparation robot, guiding task division and system integration; recognized by professors as the most intricate project in the cohort.
- Designed powder and water dispensing mechanisms and programmed DC motor control with LCD interface in C++, applying timing-based logic for reliable operation.

Award-Winning Water Filtration System, *>100L/Day Output - Top Design in Division*
- Led a 5-member team to design a water filtration system for isolated northern communities.
- Designed, programmed, and wired Arduino-based chlorination and agitation subsystems, sourcing components and ensuring reliable automation.
- Modeled and 3D-printed a custom water pump in Fusion 360, reducing costs compared to off-the-shelf alternatives.

Spring-Loaded Net Launcher, *Sub-500g Drone Capture System*
- Designed 8 custom Fusion 360 components optimized for FDM printing, reducing system weight to <0.5kg for portable drone defense applications.
- Iterated trigger mechanism through 20+ CAD revisions to improve trigger actuation smoothness and mechanical reliability.

200lb Trebuchet, *250ft Range Siege Engine*
- Built a 12-ft trebuchet capable of handling 150 lb dynamic loads and launching projectiles over 250 ft using only recycled materials.