

Matthew Choy

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Education

University of Waterloo

Bachelor of Applied Science in Mechatronics Engineering

September 2025 – Present

Work Experience

Machine Vision Co-op | Taymer International Inc.

January 2026 – April 2026

- Engineered and optimized 30+ UV and LED lighting configurations to generate high-quality images that enhanced machine vision model performance, leading to faster inspection times and more reliable quality control for clients.
- Performed soldering and mechanical assembly of machine components based on professional engineering drawings, ensuring accurate integration of electrical and mechanical systems.
- Designed and executed validation tests on machine vision inspection technology, identifying edge cases and improving detection accuracy and reliability across varying product conditions.
- Implemented and documented software updates using C++ and OpenCV, improving the efficiency of generating custom sample reports for prospective clients.

Engineering Projects

Custom Computer Numerical Control (CNC) Machine

December 2025 – Present

- Designed and built a compact 3-axis CNC machine using aluminum extrusions, linear rails, and lead screw drive systems, optimizing structural rigidity and axis alignment to improve positional accuracy.
- Designed custom parts in SolidWorks and generated toolpaths, incorporating DFM principles such as tolerancing, geometry optimization, and designing for easier manufacturing and assembly.
- Reduced mechanical errors by iterating on anti-backlash solutions, bearing supports, and coupler alignment, significantly improving repeatability and positional accuracy under load.
- Implemented fully autonomous motion control using GRBL firmware on an Arduino, wiring and configuring stepper drivers, calibrating steps/mm, and tuning acceleration and feed rates for smooth, accurate multi-axis movement.

WatBot Battlebots

June 2025 – August 2025

- Designed the robot chassis in SolidWorks, optimizing mass distribution to reserve sufficient weight for the spinning weapon assembly while staying within the 1lb class limit.
- Engineered an electrical system on a perforated circuit board with a receiver, ESCs, 6V motors, and a battery – reduced wiring failures and improved vibration resistance.

RC Airplane

June 2025 – August 2025

- Designed and built a RC Airplane, integrating a brushless motor, ESC, and LiPo battery system to meet thrust and flight requirements while achieving stability and an optimal centre of gravity.
- Built and soldered electrical systems, maintaining stable power and accurate signal transmission between the motors and control systems.
- Conducted 20+ iterative test flights to identify stability and control issues, refining mechanical and electrical configurations to improve overall flight performance.

VEX VSLAM Rover

October 2025 – December 2025

- Designed a cable telescopic linear slider mechanism for adjustable scan heights and improved mechanical reliability.
- Built and programmed a VEX mapping rover that performs 360° scans and generates real time 2D maps using the data from the distance sensor.
- Developed C++ software to track robot position relative to an origin using motor encoders and inertial sensors, converting the data into a 128 x 128 on-screen boolean map.

Skills

CAD & Design: SolidWorks, Fusion 360, AutoCAD, Drafting, Machining, 3D Printing

Hardware: Circuits, Soldering, RC Systems, Computer Assembly

Programming: C++, Java, Python

Extracurriculars: Competitive Swimming, Muay Thai, Badminton