

Gavin Tranquilino

1B Mechatronics Engineering Student

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EXPERIENCE

Mechanical Engineering Associate

Jan. 2024 – Present

Sheartak Tools Ltd.

Waterloo, ON

- Utilized SolidWorks to create 15 custom woodworking cutterhead assemblies, ensuring precision and manufacturing specifications.
- Applied engineering knowledge to create 24 installation manuals based on parts lists, ensuring accurate assembly processes for the clients.
- Utilized Adobe Premiere and Photoshop to record, script, and edit tutorials and troubleshooting guides for clients, garnering over 1,000 views on [YouTube](https://www.youtube.com) and enhancing client satisfaction.
- Developed a Python script to upload 2000+ products on Shopify and OpenCart, automating the process and saving 5 hours of manual work per week.

Robotics Design Team Leader

Feb. 2023 – May 2023

Skills Ontario Competition

Etobicoke, ON

- Leveraged embedded C/C++ programming and electrical signal processing to drive 3-phase motors.
- Led custom protoboard assembly using SMD and TH soldering, saving 30% chassis space.
- Designed and routed electronics using KiCad, resulting in efficient and customized layouts.
- Streamlined milling techniques to fabricate competition compliant hardware housing.
- Employed innovative design techniques, utilizing drill batteries and avoiding pre-built kits for electronics housing to reduce 80% of project expenses.

Intake Mechanism Designer

Nov. 2021 – Jun. 2023

FIRST Robotics Canada

Waterloo, ON

- Collaborated to design an intake mechanism using SolidWorks for large tennis balls, contributing to our qualification for the FIRST Robotics Worlds championship.
- Enhanced intake reliability and maneuverability through material testing, 3D modelling and 3D printing boosting pickup success from 50% to 80% and optimizing tight-corner performance.

PROJECTS

Self-Balancing Unicycle Game/Physics Simulation | C++, OpenGL, CMake, Raylib, Control Theory, PID, OOP

- Derived equations of motion using Lagrangian and linearization techniques to estimate and optimize trig calculations.
- Utilized C++ and CMake to develop a graphical simulator, demonstrating cascading PID control to effectively manage both the angle and position of the unicycle.
- Implemented Git submodules to reference third-party OpenGL wrappers, creating a UI for the simulator.

Blink Twice If You Need Help | Python, OpenCV, Twilio, Git, GitHub, Face Tracking

- Engineered a computer vision wearable for real time eye tracking, triggering immediate calls for assistance.
- Integrated Twilio for swift emergency contact, reducing response time.

IoT Light Switch Bot/Mount | Python, Flask, 3D Modelling, 3D Printing, Fusion360, Linux, HTTP, TLS

- Designed a 3D-printed mount with an integrated web application for remote light switch control.
- Implemented a Raspberry Pi web server, enabling remote access to room lights globally.
- Innovatively enhanced safety by designing a physical light switch mount, eliminating high-voltage work.

Hand Tracking Math Learning Tool | Python, MediaPipe, OpenCV, OOP

- Initiated hand-tracking solution to create an interactive math learning tool, enhancing student engagement and accessibility.
- Achieved Mediapipe connectivity to custom Python game engine, enabling real time hand tracking and gesture recognition.
- Led a team of 3 to develop a user-friendly interface, ensuring seamless integration with MediaPipe and OpenCV.

EDUCATION

University of Waterloo

Candidate for BAsC in Mechatronics Engineering

Waterloo, ON

Expected Jun. 2028