

# Gavin Tranquilino

*Mechatronics Engineering Student*

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## SKILLS

**Mechanical:** SolidWorks, AutoCAD, Fusion360, KiCAD, Mechanical Design, 3D Printing, Soldering, Machine Tools

**Software:** C/C++, CMake, Python, Linux, Git, Arduino, I2C, SPI, UART, NFC, Bluetooth, SQL, OpenCV, OpenGL

## EXPERIENCE

### Hardware Engineer

Apr. 2024 – Present

*Wire; Walker Industries Research And Experimentation*

*Miami, FL*

- Designed VR headset lens frames using **SolidWorks**, ensuring precise fit and optimal visibility.
- Developed a **C/C++** WebSocket interface on top of **open sourced drivers** to transmit tracking data, replacing HID transport for headset wireless connectivity.

### Mechanical Engineering Associate

Jan. 2024 – Apr. 2024

*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.
- Created internal **Selenium** tooling to scrape competitor websites, providing competitive analysis and market insights.
- 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*

- Developed embedded **C/C++** program to drive 3-phase motors and bluetooth controls.
- Designed custom protoboard assembly using **SMD** and **TH soldering**, saving 30% chassis space.
- Designed and routed electronics using **KiCad**, resulting in efficient and customized layouts.

### 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 through material testing and **3D printing** boosting pickup success from 50% to 80% and optimizing tight corner performance.

## PROJECTS

### Self-Balancing Unicycle | 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, to visualize the simulation.

### 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 **Linux** web server, enabling remote access to room lights globally.
- Innovatively enhanced safety by designing a physical light switch mount, eliminating high-voltage work.

## EDUCATION

### University of Waterloo

*Candidate for BAsC in Mechatronics Engineering*

Waterloo, ON

*Expected Jun. 2028*