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, ESP-IDF, JS, HTML/CSS, 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.
- Utilized **Adobe Premiere** and **Photoshop** to record, script, and edit tutorials and troubleshooting guides for clients, garnering over 1,000 views on YouTube 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*

- 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.

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 Waterloo, ON
Candidate for BASc in Mechatronics Engineering *Expected Jun. 2028*