Gavin Tranquilino

1B Mechatronics Engineering Student

gtranqui@uwaterloo.ca
gavintranquilino.com
linkedin.com/in/gavintranquilino
github.com/gavintranquilino

Experience

C/C++ Driver Software Engineer — Apr. 2024 – Present
Wire; Walker Industries Research And Experimentation — *Sussex County, Delaware, US*

- Designed VR headset lens frames using SolidWorks, ensuring precise fit and optimal functionality.
- Engineered a C/C++ WebSocket interface 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*

- 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 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.

Education

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