Elil Thirumugam

647-864-5231 | Personal-Website | elilthirumugam23@gmail.com | linkedin.com/in/elilthirumugam | github.com/elil

Education

University of Waterloo Sept. 2025 – Present

BASc. Mechatronics Engineering, Presidents's Scholarship of Distinction

Relevant Courses: Mechatronics Engineering, Digital Computation

Technical Skills

Languages & Frameworks: C/C++, Java, Python, JavaScript, HTML, CSS | yolov8, roboflow, react, firebase

Developer Tools: MS Office, Adobe Acrobat, AutoCAD, SketchUp, SolidWorks, MATLAB, Git, Visual Studio

Libraries and API: Pandas, NumPy, Gspread, Selenium, flet, pycharm, only-office, taskade

Power Tools: Milling Machine, Lathe, Vertical & Horizontal Bandsaw, Drill Press, Belt and Disk Sander, CNC Machine

Experience

Engineering Club Founder & President Mar. 2024 – Jun. 2025

Mayfield Secondary School *Caledon, ON*

- Developed Google slideshow presentations and technical seminars for 30+ students enhancing engagement.
- Demonstrated PID theory through Arduino 360° servos and taught material design concepts using VEX Pieces.
- Mentored and aided students in creating personal passion projects, such as a pill dispenser, by providing pieces and necessary equipment as a culmination of what students learned.

VRC Team Lead Programmer and Drive Team Mar. 2024 – Mar. 2025

Zebra Robotics *Mississauga, ON*

- Incorporated PID control in C++ using motor encoders and an IMU to reduce wasted motion by 15%.
- Built a passive climb mechanism and integrated a toggle element using a 25mm pneumatic cylinder and double-acting solenoid valve, creating a compact and reliable lift system to elevate robot by 1.8 inches.
- Generated skills code using the GNU Compiler Collection-based PROS API to secure 7th place in the skills category at provincials.

Downey's Farm Market Employee Sept. 2022 – Present

Downey's Farm Market *Caledon, ON*

- Independently managed end-to-end food truck operations, processing 300 – 400 customer orders daily while adhering to food safety protocols and effective communication, resulting in improved customer retention.
- Maintained a 30-step operation checklist daily, and tracked 40+ critical inventory items to optimize stock management by handling and organizing deliveries to reduce unnecessary expenses.
- On-boarded 25+ employees on operating a food truck, improving leadership skills and seamless workflow.

Projects

Pill Dispenser | *Arduino UNO, C++, Git* Jun. 2024

- Integrated PWM signals to control the speed and torque of servo motors to ensure pills are dropped accurately.
- Added a push-button interface with an LCD display for mode selection, leveraging a state-machine control algorithm to toggle between 2 operational modes with <100ms response time and 80% input reliability.
- Implemented OR-of-NOT logic in C++ to allow dynamic selection of dispensing quantities.

AI-Powered Smart Waste Bin | *WolfHacks 2nd* | *Fusion 360, Arduino, Gemini API, Computer Vision* May 2025

- Developed a computer vision system using a webcam and Gemini API to classify waste types with 90% accuracy.
- Automated disposal of classified waste into 4 different bins, reducing sorting errors by 70%.
- Manufactured custom cutouts in Fusion 360 to integrate servo-driven bins within the enclosure.
- Programmed servo motors with PWM control signals to direct items precisely into their respective bins.

Laptop Web Scraper | *Python, JavaScript, Selenium, Visual Studio* Aug. 2025

- Developed an end-to-end automated data pipeline in Python using the Selenium library with the ChromeDriver to parse 17,000+ laptop listings, reducing manual research by 95%.
- Implemented DOM interaction-based HTML handling of CSS selection, XPaths, and JavaScript execution to navigate through hidden buttons, nested elements, and embedded SVG tags.
- Transported raw data (laptop names, prices, and discounts) through the pandas data frame and synchronized it with Google Sheets using the gspread API with a 50ms delay to remain within usage limits.