# Ben Boguslavsky

647-877-1805 | bbogusla@uwaterloo.ca | linkedin.com/in/ben-boguslavsky | github.com/BenBoguslavsky18

## Education

**University of Waterloo** Sep. 2022 – May 2027

*BASc Candidate for Mechatronics Engineering,* ***GPA: 3.95/4.00*** *Waterloo, ON*

- Awards: President's Scholarship of Distinction, President's Research Award
- Certifications: TCPS 2, CSWA, French Immersion Certificate

## Experience

**Machine Vision Engineer Co-op** May 2025 – Present

*Taymer International Inc.* *Markham, ON*

- Created a C++/OpenCV cable defect detection module in an MFC application using ONNX-based models, with custom filtering, NMS, and Picks-Per-Inch computation to eliminate the need for manual cable measurements and inspection
- Accelerated inference of YOLO PyTorch models by 30% using ONNX Runtime with CUDA & TensorRT execution providers, building a C++ pipeline with pre/post-processing to cut deployment time from 5 min to 53 sec and eliminate engine tuning
- Secured $75K in government funding by leading a research project benchmarking dynamic vs. static input object detection models, analyzing metrics across PyTorch, ONNX, and TensorRT to optimize inference speed and deployment scalability
- Integrated Teensy 4.0 with C++ into a $50K AI cable inspection system for real-time PWM lighting control and 24-channel I/O expansion, reading camera-generated PWM signals and interfacing with MFC software via serial communication

**Robotics Undergraduate Research Assistant** May. 2024 – Present

*Active and Interactive Robotics Lab - University of Waterloo* *Waterloo, ON*

- Created a collision avoidance system for a KUKA robotic arm using 2D pose detection from Ultralytics YOLO processed in OpenCV and RealSense depth data to track human position, sending spatial info in Java to the Sunrise controller over UTP
- Designed and implemented a human-robot interaction experiment to study emotional and physiological responses to collaborative robot behavior, programming trajectory deviations on the Sawyer robot using Python and ROS
- Captured GSR data with Shimmer3 GSR+, analyzed results using pandas, and visualized intended vs. actual robot motion in real-time via a custom Pygame interface, enhancing user experience in human-robot interaction trials

**Product Development Engineer Co-op** Sep 2024 – Dec 2024

*Virtek Vision International* *Waterloo, ON*

- Built C# scripts and WinForms apps using .NET, REST APIs, and Swagger Codegen with RabbitMQ functionality to demonstrate API integration, enabling clients to create personalized software solutions and reduce support inquiries by 25%
- Migrated mobile app to a Nginx-hosted webserver with a Windows installer using Wix Toolset, enabling multi-device projector access and improving workflow efficiency across large-scale manufacturing environments

**Junior Developer in Test Co-op** Jan 2024 – Apr 2024

*AGF Management Limited* *Toronto, ON*

- Built Selenium Webdriver tests with JUnit 5, SQL, and Page Object Model design pattern, doubling overall test coverage
- Collaborated with technical experts to optimize existing test scenarios, leading to a 20% reduction in testing cycle time

**Software Quality Analyst Co-op** May 2023 – Aug 2023

*Infrastructures for Information (i4i)* *Toronto, ON*

- Created tool to transfer and format data from Excel to Word using Python and XSL, saving employees 2 hours of daily work
- Conducted functional, regression and usability testing, participating in defect triage meetings to reduce post-release defects

## Projects

**Hole/Sticker Detector @ Toyota Innovation Challenge** | *Python, Keras, OpenCV, Jupyter*

- Developed a CNN using OpenCV and Keras to classify hole and sticker features on extrusions with 98% accuracy

**Two-Axis Machine Control** | *C, STM32, UART, ADC, PlatformIO*

- Programmed a 2-axis STM32 motor control system with ADC-based speed input, limit switch interrupts, and L6470 drivers

**Virtual Reality Clothes Shopping @ Hack The North** | *C#, Unity, Shopify API, META Quest*

- Won Best Use of Shopify API & Ubisoft Game Challenge by creating a VR app to try on clothes from online stores

**Home Security Camera** | *C++, ESP32CAM, IR/Ultrasonic Sensors, Servo Motor, 3D Printing*

- Built an ESP32-CAM system with live streaming, servo panning, IR-based password access, and ultrasonic proximity detection

## Technical Skills

**Programming Languages**: C/C++/C#, Python, Java, MATLAB, VHDL
**Tools & Frameworks**: Git, SVN, ROS, Linux, OpenCV, CUDA, TensorRT, Numpy, pandas, Jupyter/Google Colab, Roboflow, Selenium WebDriver, Junit 5, Microsoft & Atlassian Suite
**Electrical, Embedded & Control Systems**: I2C, SPI, USB, CAN, UART, STM32, FPGA, Oscilloscope, Soldering, PLC
**Miscellaneous**: SolidWorks, AutoCAD, Fusion360