Ben Boguslavsky

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Education

University of Waterloo Sep. 2012 – May 2027

BASc Candidate for Mechatronics Engineering, ***GPA: 3.95*** *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 Industries *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 speed by 30% using ONNX Runtime with TensorRT and CUDA execution providers, reducing new model deployment time from 5 minutes to 53 seconds via caching and eliminating GPU-specific engine file 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*

- Engineered a collision avoidance system for a KUKA robotic arm using Ultralytics YOLO pose detection (RealSense, OpenCV, Python) and implemented real-time control logic in Java via UTP transmission to the KUKA Sunrise controller
- 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 L6470 drivers, limit switch interrupts, ADC-based speed input

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

- Created VR app enabling users to try on clothes from online stores, won Best Use of Shopify API and Ubisoft Game Challenge

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, CAN, UART, STM32, FPGA, Oscilloscope, Soldering, PLC
Miscellaneous: SolidWorks, AutoCAD, Fusion360