

KEVIN NI

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EDUCATION

University of Toronto, St. George Campus

Sept 2021 – May 2026

Bachelor of Applied Science in Engineering Science (Robotics)

Toronto, ON

- Double Minor: Engineering Business; Artificial Intelligence.

- **Relevant Coursework:** Electronics for Robotics, Microprocessors and Embedded Microcontrollers, Robot Modelling and Control, Linear Control Theory, Control Systems, Intro to AI, Intro to Learning from Data, Applied Fundamentals of Deep Learning.

- **Award:** 2025 Jeffrey Skoll Engineering Business Scholarship (\$11,225).

PROJECTS

Autonomous Object-Tracking Drone

May 2025 – Aug 2025

ROS2, C++, NVIDIA Jetson, YOLOv8, MAVROS

- Built a 7-node ROS2 system on NVIDIA Jetson with HSV/YOLOv8 vision, achieving 5–10 ms detection latency for 20 Hz drone control.
- Implemented a 6-state FSM (takeoff → track → search → land) with MAVROS watchdog for fully autonomous, failsafe flight.
- Developed Archimedean spiral re-acquisition on 5 s target loss, using T265 visual-inertial odometry.

Deep Learning Audio Diffusion Model

May 2025 – Aug 2025

Python, PyTorch, NumPy

- Built a diffusion-transformer audio generator with test-time training, improving CLAP alignment scores by over 140% vs. baseline.
- Engineered preprocessing pipeline, standardizing 18.5 hours of audio via resampling, clipping, and normalization to enhance stability.
- Integrated adaptive MLP blocks within 24 transformer layers, enabling real-time model refinement and reducing generation instability.

Embedded Robotic Companion System (STM32)

Jan 2024 – Apr 2024

C, STM32 HAL, PWM, FSM

- Designed an interactive robotic system on a STM32-DISCO integrating touchscreen UI, audio output, sensors, LEDs, and servomotors.
- Implemented a finite state machine with interrupt and timer-driven transitions to model autonomous behaviors and user interaction.
- Configured PWM, ADC, GPIO interrupts, and timers using STM32 HAL to achieve reliable real-time control and I/O synchronization.

EXPERIENCE

FORM Lab, Roy Kwon

Sept 2025 – May 2026

Undergraduate Thesis: ML-Enhanced Statistical Arbitrage Markowitz Portfolio

Toronto, ON

- Determined ML adds value at parameter estimation, not pair selection, by benchmarking 6 models across both pipeline stages.
- Built ML pipeline (ElasticNet + RandomForest → daily QP) over 12,668 CRSP equities; achieved Sharpe 0.661 and +49.4% return.
- Eliminated survivorship bias via CRSP/WRDS (19.4% survival rate vs. ~93% for free sources), quantifying a 73 pp backtest inflation.
- Uncovered regime-dependency: outperformed EW by 18.5% Sharpe in bull markets; limited drawdown to −14.1% vs. −15.3% in 2022.

Smith + Andersen

May 2024 – Aug 2025

Junior Designer, Electrical

Toronto, ON

- Designed electrical and lighting systems for 100+ interiors, ranging from 500 sq. ft. retail to 60,000+ sq. ft. corporate offices.
- Produced 100+ AutoCAD/Revit engineering drawing sets, consistently achieving a one-week average project delivery turnaround.
- Reviewed contractor pricing and material quotes to verify cost accuracy and maintain alignment with client budgets.
- Consulted with architects and contractors to resolve design challenges and develop efficient, code-compliant solutions.

aUToronto, Autonomous Vehicle Team

Oct 2024 – May 2025

Systems, Drivers Member

Toronto, ON

- Automated camera driver configuration in C++/ROS2, cutting setup time by 30% improving reliability in perception system calibration.
- Collaborated with perception and controls teams to streamline sensor integration, enabling faster testing and higher system uptime.
- Annotated and validated 2,000+ training images to enhance perception model accuracy for lane and object detection.

Kevars Autonomous Services

Jun 2023 – Oct 2023

Junior Mechatronics & Embedded Systems Specialist

Remote

- Developed a ROS + Streamlit dashboard integrating real-time robot telemetry, diagnostics, and control interfaces.
- Built a Python-based stereo-vision backend (Open3D) to automate defect detection, cutting analysis time by 40%.
- Deployed and tested embedded systems on autonomous platforms, refining communication latency and system reliability.

PERSONAL

- **Technical:** Python, Java, SQL, MATLAB, C/C++, PyTorch, NumPy, pandas, scikit-learn, Excel
- **Robotics & AI:** Robotics Systems, Embedded Systems, Control Theory, State Estimation, Machine Learning, Optimization, Autonomous Systems
- **Personal:** Swimming, Weightlifting, Cooking, Flute, Ukulele, Scuba Diving, Model Kits