Aiden Robinson

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Education

- **McMaster University** — Hamilton, ON
  Mechatronics Engineering and Management IV ; GPA: 3.8/4 — *2021 - 2027*
  Courses: *Predictive Control, Real Time Systems, Embedded Systems, Control Systems Operating Systems, Data Structures/Algorithms*

Skills Summary

- **Languages**: Python, C/C++, MATLAB/Simulink, Go, SQL
- **Embedded & Robotics**: STM32, Arduino, ROS2, Isaac Lab, OpenCV, CAN, RTOS, Linux
- **AI/ML**: TensorFlow, PyTorch, Reinforcement Learning (OpenAI Gym), Computer Vision (OpenCV, YOLO)
- **Cloud & Tools**: Docker, Kubernetes, Google Cloud Platform, Azure, Git, MySQL, Liquibase, Altium Designer

Experience

- **Tesla** — Palo Alto, CA
  Software Engineer Intern- Dynamics Modeling and Simulation — *Jan 2026 - May 2026*
  - **Physics Simulation**: Redesigning a real time system for FMU based physics simulation. Tech: **C++, FMU, Python**
  - **Control System Integration**: Creating pipeline to bring control firmware into FMUs for simulation. Tech: **C/C++**
- **TELUS** — Toronto, ON
  Software Engineer Intern- Energy Management — *May 2023 - Aug 2024*
  - **Data Center Energy Optimization RL Model**: Implemented a reinforcement learning model for the HVAC on a modular central office, projected to reduce annual energy consumption by 13%. Tech: **GCP, Python, OpenAI Gym**
  - **Network Equipment Predictive Maintenance** : Designed and tested system for IoT data on chillers to be pulled into the cloud and run a classification model to identify inefficient equipment, projected to save $50,000/year. Tech: **Google Cloud, Python, TensorFlow, SNMP, MQTT, IoT**
  - **Unsupervised Learning Analysis**: Applied unsupervised learning techniques on large battery health dataset. Found $170k/year in savings by reducing maintenance plan scheduling. Tech: **BigQuery, Python**
  - **Real-Time AI Systems**: Migrated a multimodal chatbot from a low-code environment to a Kubernetes cluster on GCP, building API endpoints and backend pipelines for robust AI integration. Tech: **Python, Flask, Docker, Kubernetes**
- **Korrelate** — Toronto, ON
  Software Engineer II Intern- Internal Tooling — *May 2025 – August 2025*
  - **Backend Architecture**: Designed and implemented the backend for an autonomous CRM system in **Python, SQLAlchemy, and MySQL**, automating email ingestion/classification and saving 10 hours/week of manual effort.
  - **Data Engineering**: Built ingestion and storage systems with real-time change detection and deduplication, improving data reliability and enabling downstream analytics/automation.
  - **Deployment and Infrastructure**: Containerized and deployed services using **Docker, NGINX, and Azure OAuth**, ensuring secure, modular, and production-ready operation across company infrastructure.
- **McMaster Formula SAE Electric Racecar** — Hamilton, ON
  Firmware and Electric Subteam Member — *November 2021- Present*
  - **Wireless CAN Update**: Designed system to remotely CAN flash firmware from RPi to ECU's. Skills: **Linux**
  - **Wheel Speed Sensor Integration**: Firmware for tachometer to measure wheel speed Skills: **C++,STM32**
  - **Automatic Sensor Calibration**: Firmware for calibration of steering wheel and pedals Skills: **C++,STM32**
  - **High Voltage Controller Respin**: Redesigned the high voltage safety system and PCB for the car. Responsible for schematic design, part sourcing, PCB routing, manufacturing, and testing. Skills: **Altium Designer, Soldering**
  - **Relay Economizer Board**: Designed an energy saving board that reduces the hold phase current for relay contacts across the car. Skills: **Altium Designer, Soldering**
- **McMaster Artificial Intelligence Society** — Hamilton, ON
  President — *Oct 2023 - Present*
  - **Responsibilities**: Overseeing 50+ students across 5 technical, logistic, and financial domains

Projects

- **Kalman Filtered IMU Sensor Fusion**: Developed a real-time sensor fusion system with a custom Kalman filter for stable roll, pitch, and yaw estimation, streamed to ROS2 for 3D visualization in RVIZ. Containerized the full stack for plug-and-play deployment and reproducibility. Tech: **Arduino, ROS2, Python, Docker, Kalman Filter**
- **PID Ball Balancing Robot**: Built a LEGO-based ball balancing robot with Arduino, servo motors, and ultrasonic sensing, tuning PID gains (K_p, K_i, K_d) to achieve stable and precise real-time ball positioning. Tech: **Arduino, PID Control**
- **Radio Signal Explorer**: Built a Docker-based system for capturing, demodulating, and decoding digital radio signals with RTL-SDR, supporting multiple modulation/decoding modes for structured RF signal analysis.Tech: **Docker, Shell**
- **Embedded Pacemaker**: Created a HIL and SIL pacemaker with interactive frontend to represent dynamic pacing modes of a pacemaker using accelerometer data. Tech: **STM32, Simulink, Python**
- **IoT Locker Service (Deltahacks 2024 Winner)**: Mobile app can lock/open a locker for food delivery. IoT data is passed to Raspberry Pi through a real time database to control servo motor. Tech: **Firebase, Python, C++, Flutter**
- **Segment Display Recognition Neural Network**: Built a feed-forward neural network in C++ from scratch with backpropagation to recognize digits from 7-segment brightness inputs, robust to noise and missing segments . Tech: **C++**