

Aiden Robinson

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EDUCATION

McMaster University

Hamilton, ON

Mechatronics Engineering and Management IV; GPA: 3.8/4

2021 to Dec 2027

- **Courses:** Robotics, Dynamic Models and Control, Embedded Systems Design, Real Time Systems, Scientific Computation, Probability and Statistics

SKILLS SUMMARY

- **Languages:** Python, C/C++, MATLAB/Simulink, SQL
- **Robotics & Embedded:** MuJoCo, Isaac Lab, ROS2, OpenCV, STM32, CAN, Linux, Raspberry Pi, Jetson Orin Nano
- **AI/ML:** PyTorch, TensorFlow, Reinforcement Learning (OpenAI Gym), NVIDIA Cosmos-Reason2
- **Cloud & Tools:** Docker, Kubernetes, Google Cloud Platform, Git

EXPERIENCE

Tesla

Palo Alto, CA

Software Engineer Intern, Distributed Systems

May 2026 to Aug 2026

- **Third-Party Platform Deployment:** Owned deploying Iteneris, a third-party vehicle engineering platform of about \$1M a year, from an unmanaged VM onto internal Kubernetes servers. Tech: **Kubernetes, containers, Linux**
- **Re-entrancy Root Cause:** Fixed silent part-number corruption in production by carrying a verdict across a re-entrant call. Tech: **Java, thread-locals**

Tesla

Palo Alto, CA

Software Engineer Intern, Dynamics Modeling and Simulation

Jan 2026 to May 2026

- **C++ Simulation Backend:** Built a drop-in C++ backend for the Python vehicle simulator, switched by one environment variable, and proved it bit-identical across 10 driving maneuvers with 108 unit and 10 integration tests. Tech: **C++, Python, nanobind, pytest**
- **Firmware in the Loop Integration:** Root caused an eight week torque freeze to a firmware initialization bug, then shipped the production rack control firmware into vehicle sims as a peer Modelica controller, replacing a hand-tuned PD approximation. Tech: **C, Modelica, Dymola, Python**
- **Benchmarking Finding:** Showed the C++ port's 2-31x infra gain vanished on real workloads, redirecting the term. Tech: **C++, Python, benchmarking**

Korrelate

Toronto, ON

Software Engineer II Intern, Internal Tooling

May 2025 to Aug 2025

- **System Design Ownership:** Owned the schema and full backend of an autonomous CRM, saving about 10 hours a week. Tech: **Python, MySQL, SQLAlchemy**

TELUS

Toronto, ON

Software Engineer Intern, Energy Management

May 2023 to Aug 2024

- **Data Center Energy Optimization RL Model:** Prepared an energy optimizing HVAC reinforcement learning model for a new data centre build. Tech: **GCP, Python, OpenAI Gym**
- **Unsupervised Learning Analysis:** Found \$170k/year in savings with k-means and correlation analysis on battery health data. Tech: **BigQuery, Python**

McMaster Formula SAE Electric Racecar

Hamilton, ON

Firmware and Electric Subteam Member

Nov 2021 to Present

- **Over the Air CAN Reflashing:** Built OTA CAN firmware reflashing from a Raspberry Pi into the STM32 ROM bootloader. Tech: **Linux, SocketCAN, python-can, STM32, MCP2515**
- **Bus Timing Failure Analysis:** Root caused a multi-node CAN failure to the controller having no stable clock for bit timing. Tech: **MCP2515, CAN, oscilloscope work**

PROJECTS

EMG to Force Prediction (Final Year Design Project)

Hamilton, ON

Capstone Team Member

Aug 2026 to Present

- **Hybrid EMG to Torque Network:** Built a TCN into Hill muscle model network that beats physics-only torque estimates. Tech: **PyTorch, MyoSuite**
- **Sensor-Free Torque Ground Truth:** Labelled elbow torque without a force sensor using free weights, stereo pose estimation and MuJoCo inverse dynamics, fused with the suit's IMU. Tech: **RTMPose, OpenCV, MuJoCo**

FabBench: Cosmos-Reason2 Video Reasoning Benchmark

Hamilton, ON

Personal Project

Oct 2026 to Present

- Built a video reasoning benchmark for NVIDIA Cosmos-Reason2 on factory footage, with held-out factories and bias controls, showing the 8B at chance on temporal questions. Tech: **NVIDIA Cosmos-Reason2, MLX, PyTorch, MuJoCo, ffmpeg, OpenCV**
- **Synthetic video QA in MuJoCo:** Built a MuJoCo synthetic video QA generator with exact labels. Tech: **MuJoCo, MjSpec, Python, ffmpeg**
- **Isaac Lab Quadruped Locomotion:** Trained a Unitree Go2 walking policy with PPO in Isaac Lab, headless on a 6 GB GPU, and exported it to ONNX. Tech: **Isaac Lab, Isaac Sim, PyTorch, rsl_rl PPO, ONNX**
- **Diffusion Policy Impedance Control:** Reimplemented a CoRL 2026 impedance control method for articulated object manipulation in MuJoCo, matching the authors' reference code to about 1e-10. Tech: **PyTorch, MuJoCo**
- **Kalman Filtered IMU Sensor Fusion:** Real-time IMU fusion with a custom Kalman filter, streamed to ROS2 and containerized. Tech: **Arduino, ROS2, Python, Docker, Kalman Filter**
- **Embedded Pacemaker:** Built a HIL and SIL pacemaker with an interactive frontend for dynamic pacing modes. Tech: **STM32, Simulink, Python**