

DHRUMIT PATEL

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Mechatronics Engineering graduate with hands-on experience in automated validation, robotic and electromechanical systems, sensor integration, and production-floor troubleshooting. Develops repeatable Python/C/C++ test workflows, collects measurement data, applies pass/fail criteria, and isolates mechanical, electrical, firmware, and software faults.

SKILLS

Mechanical & Fixture Design: SolidWorks, AutoCAD Electrical, GD&T, machine design, part/assembly drawings, 3D printing, DFM, BOMs

Test Development: Python, C/C++, Git, automated test sequencing, pass/fail analysis, telemetry/data acquisition, test reporting

Controls & Robotics: FANUC, ROBOGUIDE, TP programming, Studio 5000, PLC debugging, vision systems, VFDs, safety functions

Sensors & Instrumentation: oscilloscopes, ToF sensors, IMUs, encoder feedback, calibration, signal analysis, fault isolation

Embedded & Interfaces: Raspberry Pi, Arduino, UART, I2C, SPI, Modbus/TCP, EtherNet/IP, hardware/firmware integration

WORK EXPERIENCE

Hardware Validation Engineer Intern

Sep 2024 - Aug 2025

Rockwell Automation Inc. (R&D) | Cambridge, ON

- Developed a Python-based automated test framework to sweep VFD parameters, log real-time telemetry, and evaluate DUT results against pass/fail thresholds, reducing manual execution time by about 40%.
- Executed repeatable board-level tests on next-generation control hardware, measuring voltage/current waveforms, rise time, overshoot, and PWM duty-cycle accuracy with oscilloscopes.
- Performed prototype bring-up and root-cause analysis, tracing schematics and Modbus/TCP and EtherNet/IP behavior to isolate and document hardware/firmware integration faults.

Software Reliability Engineer Intern

May 2024 - Aug 2024

AMD (Advanced Micro Devices) | Markham, ON

- Built Python/C++ test pipelines and telemetry tools to automate data collection and evaluate CPU/GPU performance, stability, power, and thermal behavior under sustained load.
- Executed stress and thermal-saturation tests across hardware platforms to characterize stability limits and identify reliability bottlenecks.
- Reproduced failure modes, analyzed quality and reliability metrics, and connected test evidence to hardware, firmware, and driver corrective actions.

Automation Engineering Intern

Jul 2023 - Apr 2024

Biscuits Leclerc | Brockville, ON

- Provided hands-on production support for a FANUC palletizing cell, diagnosing sensor timing, conveyor, and I/O synchronization faults to restore deterministic operation and reduce downtime.
- Validated a conveyor-mounted vision inspection station against acceptance criteria, evaluating defect detection, false rejects, and downstream diversion of nonconforming product.
- Debugged Studio 5000 PLC logic by tracing I/O states, timing sequences, and reset behavior to verify safe fault recovery and correct equipment response.

SELECTED PROJECTS

Autonomous Delivery and Retrieval Rover | Capstone Team Project

- Contributed to a DFM-focused 4WD rover with custom CAD/3D-printed chassis, motor and sensor mounts, part/assembly drawings, BOM, and wiring integration for an Arduino Due, H-bridge drivers, encoder motors, servos, four ToF sensors, and a 6-DOF IMU.
- Integrated and calibrated sensors using sequential I2C polling, filtering, encoder feedback, and IMU correction; applied staged tests, FMEA, and failure data to identify gripper, drivetrain, and state-machine issues and recommend design improvements.

Automated Hardware Performance Benchmarking Suite

- Developed a Python/C++ framework for repeatable test sequencing, telemetry collection, and latency/throughput measurement across hardware configurations.
- Implemented thermal stress analysis and automated pass/fail reporting to compare reliability and expose performance limits under sustained load.

EDUCATION

B.Eng., Honors Mechatronics Engineering | Ontario Tech University, Oshawa, ON

Sep 2020 - 2026

Relevant Courses: Real-Time Embedded Systems, Actuators & Power Electronics, Microprocessor & Digital Systems, Sensors & Instrumentation