

YOUSSEF MAHMOUD

EDUCATION

Bachelor of Science in Computer Engineering (Co-op)

University of Manitoba

- Expected date of graduation: December 2026

WORK EXPERIENCE

Embedded System Engineering Intern

05/2026 – Present

Wabtec (Full Time)

- Lead validation of **networking and dynamic memory requirements** for embedded railway software, developing and executing **43 test cases** within a **300+ case** system verification effort.
- Applied **Linux, Python, Scapy, and packet-level analysis** to validate **ARP and LLDP** behaviour, reproduce software issues, and support defect investigation and resolution.
- Saved engineers and senior leaders approximately **2–3 hours per week** by developing an **IBM CLM to Power BI pipeline** that automates data ingestion and delivers decision ready project dashboards.
- Eliminated **two weekly progress meetings** and saved **10 engineering hours per week** by developing a live **Streamlit dashboard** that transformed Excel test-case data into centralized progress reporting for a **five person engineering team**.

Software Test Engineer Intern

05/2025 – 08/2025

Wabtec (Full Time)

- Built a modular Python engine that migrated **455 unique test cases** and **26 test plans** from Rally to IBM CLM via REST APIs, integrated a Selenium regression suite to validate the workflow, delivering the project **4 weeks early** and **accelerating project onboarding by 57%**.
- Re-architected the results submission pipeline, enabling direct ingestion into IBM CLM and **eliminating an entire tracking tool**, reducing operational overhead
- Detected gold plating degradation during vibration testing, preventing overheating prone **\$7K locomotive control modules** from advancing to production and mitigating significant recall and field failure risk.
- Performed **APACER SSD firmware flashing** and validation, debugging storage issues through controlled testing to verify reliability and compatibility in embedded train systems.
- Developed and maintained Python based automated test frameworks using **GitLab version control, Playwright, Selenium**, and **Robot Framework**, executed in **Linux-based** CI environments.

Data Engineering Intern

05/2023 – 08/2024

Manitoba Hydro (Full Time)

- Designed and deployed **10+ production-grade data pipelines** in **Azure Synapse & Databricks**, streamlining ETL workflows and improving data delivery reliability.
- Authored a **60-page data-engineering** guide adopted as onboarding material for the team.
- Processed, cleaned, and transformed datasets up to **2M+ records** using Python, SQL and Pandas, improving data quality and enabling accurate business reporting.
- Delivered **10+ Power BI reports** and presented new analytics features to an **audience of 500+ employees** as part of the Power BI Community of Practice Experts, establishing myself as a key subject matter contributor.
- Orchestrated end-to-end pipeline workflows using **Git-based repositories**, improving system performance through API integrations, monitoring, and automated optimizations.
- Coordinated **DevOps processes** and **Agile** ceremonies, including sprint planning, standups, and backlog refinement, improving team alignment and sustaining predictable sprint velocity across multi-team projects.

TECHNICAL SKILLS

Programming languages — Python, SQL, C/C++, Java, MATLAB, Javascript, HTML, Verilog, R, ARM Assembly, DAX, CUDA and Swift.

Computer & Tools — Git (GitLab, GitHub), Linux/Unix, Bash, Azure (DevOps, Synapse, Data Factory, Databricks), CI/CD, Microsoft Power BI, Figma, MPLabX, STM32Cube, Robot Framework, Playwright, Selenium, Rally, IBM CLM, Slack

Languages — Fluent in English, French, and Arabic.

PROJECTS

Capstone Project - Coupler Strength & Status Diagnostic System

- Built an embedded diagnostic prototype for train coupler monitoring by integrating sensor data acquisition with a neural network to estimate remaining coupler force.

ESPBoy — 1st Place, UMAKE Hardware Hackathon 2026

- Won 1st place at the UMAKE Hardware Hackathon by developing a dual-ESP32 handheld gaming system using C/C++ and ESP-NOW, with embedded games and a live web interface for spectator controlled gameplay.