

# Atef Elsharkawy.

Controls and Software Engineer | Robotics and Industrial Automation | Python, React, and AI Applications

Troy, MI · Open to remote and relocation · [elshark.atef@gmail.com](mailto:elshark.atef@gmail.com) · [linkedin.com/in/atefelsharkawy1](https://www.linkedin.com/in/atefelsharkawy1)

## SUMMARY

Controls and software engineer with 5+ years in automotive, electric vehicle (EV) battery, and process automation, spanning Programmable Logic Controllers (PLC), robotics, machine vision, and electrical design. Builds in-house artificial intelligence (AI) tools in Python and React that cut engineering design reviews from hours to minutes. Pursuing an MSc in Artificial Intelligence.

## EXPERIENCE

### Controls Engineer · General Motors

Oct 2023 – Present

Warren, MI

- Automate a manual final line with new-to-industry robotics assembling doors, hoods, fenders, and door and hood hinges, using best-fit Atlas Copco bolt runners, bolt and U-nut feeders, net form and pierce, and variation-reduction cameras for gap and flush.
- Validated automation for electric vehicle (EV) battery mini-stack production at Factory ZERO and Orion Assembly, supporting Cadillac, HUMMER, and Equinox battery builds.
- Test, validate, and audit automation against throughput and quality targets; update PLC logic for approved changes.
- Analyze production data and downtime reports to cut recurring alarms by 50%, drive supplier deliverables and buyoff checklists, and track open issues to closure with leadership.
- Build, as sole developer, an AI platform available to all GM Automation engineers and suppliers that audits wiring, power, and network designs in minutes instead of hours or days, catching power supply overloads and missing safety devices.
- Architect its Python/FastAPI, React, and PostgreSQL/pgvector stack with an LLM and RAG assistant, YOLO and OCR drawing reading, and single sign-on; ship through 1,200+ tests, Docker, CI/CD, and Kubernetes on Azure.

### Project Controls Engineer · S and T Controls

Mar 2023 – Jul 2023

Kitchener, ON, Canada

- Developed and debugged Studio 5000 PLC and HMI programs for 5 body shop cells and verified their wiring diagrams.

### Controls Specialist · Onyx Engineering Inc.

May 2022 – Mar 2023

Windsor, ON, Canada

- Designed PLC, HMI, and SCADA logic for 3 plants (distillery, food, wastewater) on Allen-Bradley, Emerson, Modicon, PlantPAX.
- Drew schematics and panel layouts in AutoCAD Electrical and resolved field downtime calls.

### Machine Vision Engineering Technician · Vista Solutions Inc.

Aug 2021 – May 2022

Windsor, ON, Canada

- Programmed, commissioned, and supported all vision cameras in a GM body shop using Matrox Design Assistant for sealer, adhesive, and weld inspection; trained plant staff to troubleshoot them.

### Controls Technologist · SIDAC Automated Systems Ltd

Feb 2021 – Aug 2021

North York, ON, Canada

- Designed 5 control panels in AutoCAD Electrical, including component selection and thermal and power distribution calculations.

## TECHNICAL SKILLS

**Controls and Robotics:** PLC: Allen-Bradley Studio 5000, RSLogix 500, Siemens TIA Portal, STEP 7, GuardLogix safety; Human-Machine Interface (HMI) and Supervisory Control and Data Acquisition (SCADA): FactoryTalk View, Ignition, WinCC, Cimplicity, ThinManager; PlantPAX, EtherNet/IP, Profinet, DeviceNet, FANUC robots, Atlas Copco tightening, machine vision

**Electrical Design:** AutoCAD Electrical, EPLAN Electric P8, wiring diagrams, panel layouts, power sizing calculations, commissioning

**Languages:** Python, JavaScript, TypeScript, SQL, HTML/CSS, Bash, YAML

**Backend:** FastAPI, REST APIs, Pydantic, SQLAlchemy, async Python (asyncio, httpx), JSON Web Token (JWT) auth, rate limiting

**AI/ML:** Large Language Model (LLM) APIs (OpenAI, Anthropic Claude, Databricks), Retrieval-Augmented Generation (RAG), prompt engineering, embeddings, PyTorch, Hugging Face, YOLO, OpenCV, Optical Character Recognition (OCR)

**Frontend:** React, Next.js, Vite, TanStack Query, React Router, PDF.js

**Data and Documents:** PostgreSQL, pgvector, SQLite, FAISS, pandas, openpyxl, PyMuPDF, pdfplumber, ReportLab, python-docx

**DevOps and Testing:** Git, Docker, GitHub Actions, Continuous Integration/Continuous Deployment (CI/CD), Azure (Kubernetes, Helm, Key Vault, Entra ID single sign-on), pytest, Vitest

## EDUCATION

---

**Master of Science, Artificial Intelligence** · University of Leeds, UK Jul 2025 – Jul 2027 (Expected)

**Bachelor of Engineering Technology, Mechatronics**, With Distinction · University of Windsor, ON, Canada Sep 2022 – Aug 2023

**Ontario College Advanced Diploma, Electro-Mechanical Engineering Technology** · Durham College, ON, Canada Sep 2017 – Jun 2020

**Honors:** Dean's Honor Roll; General Motors of Canada Automatic Award

## CERTIFICATIONS

---

Global Common Controls Software (GCCS-2) · General Motors

Global Robot Specifications (GRS) · General Motors

RESS 101 Safety Training

Controls Capability Assessment · Rockwell Automation

EPLAN Electric P8 Basics for GM (v4.6) · EPLAN

Zebra Matrox Aurora Design Assistant Application Development · Zebra / Matrox

Global Common Controls Hardware (GCCH-1) · General Motors

GM Lockout and Energy Control · General Motors

ThinManager Certification · Rockwell Automation

Advanced STEP 7, Levels 1 and 2 · Siemens

FANUC HandlingTool Operation and Programming · FANUC

**Languages:** English (fluent), Arabic (native), German (beginner)

## VOLUNTEER WORK

---

**Meals On Wheels**, Community Care Durham, Whitby, ON, Canada. Delivered meals every week to elderly members of the community with physical and mental health needs. Feb 2022 – May 2022