Ahmed Elbadawy Mohamed

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Machine learning engineer (MSc, Western University) specializing in deep learning and medical image analysis, with hands-on experience across the full stack, from model development to embedded and web applications.

Education

Bachelor's degree in Systems and Biomedical Engineering,
Cairo University, Grade: Excellent, 3.83
07/2022 | Cairo, Egypt
Ranked 3rd of 105 in the final year.
Thesis (ranked 2nd in department): Investigated the role of DNA-repair-gene mutations in cancer evolution.

Master's degree in Machine Learning in Health and Biomedical Sciences, *Western University*
09/2024 – Expected 09/2026 | London ON, Canada
Developing deep-learning and image-processing methods for thoracic CT imaging

Experience

Research Assistant, *Western University*
09/2024 – present | London ON, Canada
- Trained a residual U-Net to denoise CT perfusion maps from low-temporal-resolution scans; lightweight architecture and pretraining compensated for limited data.
- Developing a segmentation model to delineate ischemic penumbra and core infarct on cerebral perfusion maps to guide treatment decisions for stroke patients.
- Built a single-acquisition pipeline utilizing image registration, signal processing, and physiological decomposition to generate lung Ventilation/Perfusion maps from a single CT scan.

AI Research Assistant, *Sejong University*
03/2024 – 09/2024 | Seoul, South Korea
Built a multi-stage deep-learning pipeline to detect and grade lumbar spinal stenosis from MRI.
- Used a YOLO model to localize the region of interest on lumbar MRI scans.
- Applied an EfficientNetV2 CNN to grade stenosis severity (normal, mild, moderate, severe).
- Integrated an LLaMA-based LLM to generate text explanations for each grading decision.

Clinical Engineer (Mandatory Military Service),
Elhelmia Military Hospital
01/2023 – 02/2024 | Cairo, Egypt
- Preventive maintenance for critical care equipment (defibrillators, ventilators, ECG machines), coordinating with vendor teams for escalated repairs, and handling routine clinical-engineering administration.

AI Engineering Intern, *Valeo*
09/2022 – 12/2022 | Giza, Egypt
Explored using LLMs to automate unit-test generation for embedded developers, aiming to save developer time.
- Fine-tuned a CodeT5 (T5-architecture) model on C code to automatically generate unit tests for C methods; produced a working proof-of-concept.
- Conducted a literature review on LLM-based test generation and presented the approach and its potential value to the team.

Bioinformatics Research Intern (Remote),
Center for Genomic Regulations (CRG), Weghorn Lab
08/2021 – 07/2022 | Barcelona, Spain
Investigated the role of DNA-repair-gene mutations in cancer evolution.
- Decomposition of the mutational signatures and quantify the contribution of deficient DNA-repair genes to cancer mutations.
- Built Wright–Fisher simulations to model how repair-gene mutations elevate overall mutation rates and increase the likelihood of acquiring cancer-driving mutations.
- Engineered Python data-processing pipelines on Azure to process 3M+ mutational records.

Technical skills

Languages: Python, C++, Java, MATLAB, R, JavaScript

ML & Data: PyTorch, TensorFlow, scikit-learn, PySpark, Weights & Biases, Power BI, Snowflake

Web: React, Angular, Node.js, Flask, HTML, CSS

Databases: SQL, MySQL, SQLAlchemy

Cloud & DevOps: AWS, Azure, Docker, Git

Embedded & Other: C, ESP32, Assembly (8051), OpenGL, PyQt

Awards

2nd Place — Smart Cities Hackathon (Smart Surveillance track) Powered by AWS, *Benha University, Egypt*
03/2022
Built "Smart Surveillance for Alzheimer Patients," a wearable IoT and ML system: an ESP32 reads WiFi signal strengths (RSSI) fed to an XGBoost model for indoor localization that alerts staff if a patient leaves a safe zone, with onboard sensors tracking heart rate and sweat rate to flag emergencies such as falls; included a Progressive Web App (HTML, CSS, Node.js).

Publications

Evaluating AI-Powered Predictive Solutions for MRI in Lumbar Spinal Stenosis: A Systematic Review,
Artificial Intelligence Review Journal
05/2025

Artificial Intelligence Segmentation Framework for Identifying Significant Pathological Areas Causing Lumbar Spinal Stenosis,
Proceedings of The IRES International Conference 2024
07/2024 | Jeju Island, South Korea

Manuscripts in Preparation
1. Generating Perfusion Maps from Multiphase Coronary CTA for Myocardial Ischemia Assessment
2. CT perfusion for simultaneous imaging of lung ventilation and perfusion (VQ)

Scientific presentations

CT perfusion for simultaneous imaging of lung ventilation and perfusion (VQ), *Oral presentation at SPIE Medical Imaging (Vancouver, 2026). Accepted for AAPM (Vancouver, 2026) — Science Council Innovation in Medical Physics finalist.*

Generating Perfusion Maps from Multiphase Coronary CTA for Myocardial Ischemia Assessment,
Accepted as an oral presentation at AAPM (Vancouver, 2026)

Projects

Lumbar Spine Segmentation (Python, PyTorch, MONAI, W&B)
Built a U-Net with Squeeze-and-Excitation attention to segment five lumbar spine structures from axial MRI for lumbar spinal stenosis assessment.

Computer vision Library (C++, Python)
Implemented classic CV algorithms from scratch: noise filters, Harris corner detection, edge detection, and Hough transform.

Seizure-Detection (Python)
SVM-based detection of seizure events in human EEG recordings.

Self-driving Car (Python, Node.js, Arduino,ESP32)
Arduino-built car with manual and autopilot modes, controllable via mobile app or website.

Sound Equalizer (Python, Pyqt)
DSP app with frequency-band equalization, playback, and a spectrogram viewer with persistent settings.