

# ASSEM ELQERSH

AI/ML Engineer ♦Computer Vision ♦Generative AI

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## PROFESSIONAL SUMMARY

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AI/ML Engineer and Computer Software Engineering graduate with hands-on experience building AI applications and ML pipelines across computer vision, medical AI, NLP, and applied Generative AI. Published IEEE research on medical-image super-resolution, with three additional IEEE conference papers listed as accepted and forthcoming. Experienced with Python, PyTorch, TensorFlow, FastAPI, and integrating model capabilities into usable software systems.

## TECHNICAL SKILLS

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**Programming:** Python, Java, C, C++, JavaScript, TypeScript

**Machine Learning & Vision:** PyTorch, TensorFlow, scikit-learn, OpenCV, NumPy, Pandas, CNNs, sequence models, model evaluation

**LLMs & Generative AI:** Vision-language models, LLM integrations, tool-calling agents, prompt-based workflows, Hugging Face

**Backend & Data:** FastAPI, REST APIs, MongoDB, MySQL, Redis, Celery, Docker, Docker Compose, Git, GitHub

## EXPERIENCE

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### MechaML

Jan 2026 – Oct 2026

Head of Deep Learning R&D

Hybrid

- Led deep learning R&D initiatives across project-based engagements, investigating novel methods, mechanisms, and model architectures to address diverse technical challenges.
- Collaborated on research activities and publication development, contributing to literature review, experimental investigation, and technical analysis.
- Designed, implemented, and evaluated AI/ML systems and prototypes, translating research findings into practical technical solutions.
- Contributed to multiple technical review and research sessions, supporting experimentation, knowledge sharing, and R&D direction.

### Information Technology Institute (ITI)

Jul 2025 – Oct 2025

Generative AI & Python / Web Development Intern

Remote

- Implemented Generative AI prototypes, model pipelines, and Python backend components for applied ML services.
- Integrated ML models into interactive web dashboards for model use and performance visualization.

### NeuronetiX

Aug 2024 – Oct 2024

Machine Learning Intern

Remote

- Built data-preprocessing and feature-extraction pipelines, then trained and validated ML models as part of collaborative code-review workflows.

### Mindset Training

Aug 2024 – Sep 2024

Machine Learning Intern

Remote

- Implemented foundational ML/DL models, including CNNs and RNNs, and created reproducible data-manipulation workflows in Python.

### Creativa Hub Alexandria

Aug 2024

Data Science Intern

Onsite

- Developed baseline models and feature-engineering workflows for time-series and tabular datasets.

## SELECTED PROJECTS

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### MedFlow-V2 — AI-Assisted Hospital Management System

Graduation Project I & II – Grades A+ / A

[GitHub](#)

- Built a clinical workflow platform with FastAPI, MongoDB, React/TypeScript, and Docker, integrating Google MedGemma for AI-assisted chest X-ray analysis and clinical reporting; implemented role-based workflows, visit sessions, and audit trails.

### RepoDigest — GitHub Repository Intelligence for LLMs

[GitHub](#)

- Created an open-source Python/FastAPI tool published on PyPI as `ghdigest` that converts repositories into LLM-ready text digests and structured JSON, with AST-based parsing, caching, token estimation, and multi-provider analysis workflows.

## **AIOps Brain — Autonomous AI Operations Agent**

[GitHub](#)

- Developed a customer-support agent using Mistral tool calling and n8n orchestration for ticket classification, contextual responses, audit logging, and Slack escalation.

## **NewsLies — Arabic Fake-News Detection**

[GitHub](#)

- Benchmarked AraBERT and a two-layer LSTM for Arabic misinformation classification on AFND, using Arabic-specific text normalization and tokenization.

## **Arabic Sign-to-Text Translation**

[GitHub](#)

- Developed a real-time assistive prototype translating continuous Arabic sign-language gestures into text using MediaPipe skeletal landmarks and temporal sequence models.

## **PUBLICATIONS & RESEARCH**

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### **A Systematic Framework for Evaluating the Diagnostic Impact of Super-Resolution Models in Medical Imaging**

*JAC-ECC 2025, Published*

[IEEE Xplore](#)

- Evaluated five CNN-, GAN-, and Transformer-based super-resolution models for pediatric chest X-ray diagnosis under domain shift; FreqFormer reached  $AUC = 0.87$  and recovered approximately 52% of the diagnostic-performance gap without changing the downstream classifier.

### **Path-Aware Positional Encoding for Raster-Scan Autoregressive Image Generation in CRT Signal Space**

*NILES 2026, Accepted, forthcoming*

- Reported a 0.73 bits-per-dimension improvement after removing redundant 1D sequence positional encoding on Oxford Flowers 102 at  $32 \times 32$ ; traversal locality correlated strongly with performance across nine image traversals ( $r = 0.996$ ).

### **Resource-constrained Dual-task Edge Intelligence for Agricultural Monitoring Using Multi-preprocessing Architectures**

*JAC-ECC 2026, Accepted, forthcoming*

- Designed an offline ESP32 edge node combining an INT8-quantized YOLOv8s-cls model for plant pathology and a lightweight C decision tree for irrigation demand; the reported 14-day field test reduced water consumption by 37.4% versus timer-based scheduling.

### **Where Does Identity Hide in Wi-Fi Sensing? Localizing Leakage Shortcuts in CSI Physiological Data**

*JAC-ECC 2026, Accepted, forthcoming*

- Investigated identity leakage in channel-state-information physiological sensing; post-hoc attackers achieved 100% identity recovery under the tested adversarial strengths, while first-difference and DC-removal preprocessing reduced linear-probe performance close to the 0.333 baseline.

## **EDUCATION**

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### **B.Sc. in Computer Software Engineering**

*Oct 2021 – Feb 2026*

*Egypt-Japan University of Science and Technology (E-JUST)*

Relevant coursework: Deep Learning, Computer Vision, Robotics, Cryptography, Parallel Computing and Distributed Systems, Data Structures and Algorithms, Numerical Analysis, Computer Architecture, Operating Systems.

## **LEADERSHIP & VOLUNTEERING**

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### **Treasurer, IEEE E-JUST Computer Society Student Branch**

*Oct 2024 – Oct 2025*

- Managed budgets and sponsorships for 10+ workshops and seminars; coordinated logistics for JAC-ECC 2024, Robo-Rave 2025, and FireFighting Boat 2025; represented E-JUST at the IEEE Region 8 CS SYP Conference 2024.

### **TechX Ambassador, IEEE CS SYP**

*Jan 2025 – Jan 2026*

### **MENA SYP Ambassador, IEEE Region 8**

*Jun 2025 – Sep 2025*