Khairy Islam Shaheen

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Summary

AI/ML and embedded systems engineer with hands-on experience in PyTorch edge inference, HuggingFace NLP pipelines, computer vision on constrained hardware, and gaze-controlled HCI research. Built a real-time drowsiness detector (DenseNet121 + CUDA), a 3-subsystem Arduino robotics platform, and a zero-trust LLM-powered enterprise chatbot with Gemini 1.5 Flash.

Education

Egypt-Japan University of Science and Technology (E-JUST) Oct 2023 – Feb 2028
B.Sc. Computer Science & Engineering | cGPA: 3.2
Coursework: Data Structures (C), Advanced Programming (OOP), Computer Networks, Signals & Systems, Electronics Engineering, Probability & Statistics

Experience

Shaheen for Import & Export Aug 2022 – Present
IT & Digital Operations Lead Tanta, Egypt
- Built a zero-trust WhatsApp AI chatbot (FastAPI + Gemini 1.5 Flash) with environment-level access control, hardcoded keyword fence interceptor neutralizing prompt injection before LLM exposure, and stateful per-user conversation sessions
- Developed Arabic text normalization middleware (`normalize_arabic()` with Unicode variant mapping: alef/taa-marbuta/alif-maqsura standardization) enabling automated bilingual filesystem operations across 1,343 enterprise files

Digital Egypt Pioneers Initiative (DEPI Round 5) Jul 2026 – Present
Cybersecurity Trainee Remote
- Simulating secure network architectures, routing protocols (OSPF, EIGRP), and defense topologies in Cisco Packet Tracer

PC Building Store Jun 2019 – Aug 2022
Technical Assistant Tanta, Egypt
- Assembled 40+ custom PCs; diagnosed hardware issues (thermals, BIOS, driver conflicts)

Projects

MRL Eye State Classification – Drowsiness Detection *PyTorch, DenseNet121, CUDA 12.6, OpenCV*
- Fine-tuned DenseNet121 (pretrained ImageNet) for binary classification (awake vs sleepy) on MRL Eye Dataset – 15 epochs, Adam optimizer, NVIDIA RTX 3050 (4GB VRAM)
- Built real-time webcam inference pipeline: Haar Cascade eye ROI extraction, temporal smoothing to prevent classification flicker, async inference for non-blocking feed, visual + audible drowsiness alerts
- Developed 21 scripts: augmentation, retrain iterations (v2-v4), quantization, benchmarking, camera tests

ErgoX-UI – Gaze-Controlled Accessible Interface (contributor) *SwiftUI, ARKit TrueDepth, iPhone 16 Pro*
- Contributed UI to a team SwiftUI gaze-controlled interface based on CHI'25 "Stretch Gaze Targets Out" research – built the contacts/messages view, media player, and playlist views
- Worked with adjustable dwell-time selection (500-1000ms) and the ARKit TrueDepth gaze-tracking pipeline

Arduino Robotics Competition – 3 Autonomous Subsystems *Arduino C++, Sensors, Algorithms*
- **Maze Solver:** Ultrasonic wall-following robot (NewPing + HC-SR04) implementing left-hand rule traversal with threshold-based turn logic and continuous distance mapping
- **Light Seeker:** Differential-drive robot using LDR sensors with analog threshold motor control
- **Arena Robot:** Bluetooth-controlled (RemoteXY) with DHT11 temperature/humidity + MQ gas sensing

ESP32-CAM – AI Smart Stick for Visually Impaired *Embedded C, Computer Vision*
- Engineered a navigation aid for the visually impaired with custom embedded dataset research and edge-device model optimization under severe memory/processing constraints

Customer Ordering System *FastAPI, HuggingFace API, Docker*
- Integrated HuggingFace distilbert for automated support ticket priority detection (URGENT/NORMAL sentiment classification)
- Built PII redaction middleware and PromptInjectionGuard; validated with 146-line pytest suite

NMEA Serial Radar Simulator *Python, Serial Communication, NMEA 0183*
- Generated NMEA 0183 GGA (GPS fix) + HDT (heading) sentences with configurable COM port, baud rate, and threaded interactive lat/lon/heading control

Technical Skills

AI/ML: PyTorch (DenseNet121, fine-tuning, CUDA 12.6), HuggingFace Inference API (distilbert), Google Gemini API (1.5 Flash), OpenCV (Haar Cascade)

Embedded: ESP32-CAM, Arduino (RemoteXY, NewPing, DHT11, MQ, LDR, HC-SR04), NMEA 0183 serial

Languages: Python, C++, C, Swift, Arduino C++, JavaScript, SQL

Frameworks: FastAPI, Django 6 + DRF, SwiftUI + ARKit, React 19

Tools: Docker, Git, CUDA Toolkit, Cloudflare, Figma, LaTeX (Overleaf)