

ZIAD KHALED

Computer Engineering Undergraduate | AI Engineer Aspirant

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PROFESSIONAL SUMMARY

Motivated Computer Engineering undergraduate at the British University in Egypt with a strong foundation in artificial intelligence, machine learning, and software development. Proficient in C++, Python, PyTorch, Java, and C#, with hands-on experience in computer vision, neural network design, and agentic AI systems. Proven ability to work effectively under pressure while delivering high-quality results. Passionate about contributing to impactful AI engineering projects and building intelligent systems that bridge research and real-world deployment.

TECHNICAL SKILLS

Programming	C++, Python, Java, C#, Assembly
AI / ML	PyTorch, YOLO Segmentation, Neural Networks, Neural Network Architectures, Computer Vision
Software Dev	OOP, Debugging, Version Control (Git)
Hardware	Arduino, 8051 Architecture, Circuit Design
Core Skills	Problem-Solving, Logical Thinking, Time Management, Teamwork, Autonomous Work

EDUCATION

B.Sc. Computer Engineering

Expected: October 2026

The British University in Egypt (BUE)

Relevant Coursework: Machine Learning, Computer Vision, Data Structures & Algorithm Design, Analysis and Design of Algorithms, Distributed Systems, Operating Systems, Database Systems, Software Engineering, Computer Architecture, Discrete Mathematics, Probability and Statistics, Signals and Systems, Digital Signal Processing, Internet Programming, Mobile Computing, Data Communication and Computer Networks, Modelling and Simulation Techniques, Cloud Computing, Cyber Security.

High School Diploma

January 2019

New Pakistan English School, Kuwait

CERTIFICATIONS & TRAINING

- Neural Network Architectures — Codecademy
- Introduction to DevOps — Codecademy
- Build Deep Learning Models with PyTorch — Codecademy
- Learn Advanced Data Structures with Python: Trees — Codecademy
- Learn Advanced Python 3 — Codecademy
- Learn Advanced Algorithms with Python: Hamiltonian Algorithms — Codecademy
- Data Analysis and Visualization (60 hrs) — ICT Hub Egypt
- Cloud Computing (60 hrs) — ICT Hub Egypt
- Optical Fiber & DWDM (60 hrs) — ICT Hub Egypt
- Cyber Security (60 hrs) — ICT Hub Egypt
- Machine Learning & AI (60 hrs) — ICT Hub Egypt
- Web Design Training (60 hrs) — AiTB Educational Services
- High Speed Rail Project Information Session — Siemens Egypt & BUE

EXPERIENCE

Machine Learning Engineer Intern

2026 – Present

FlyRank

- Working as a Machine Learning Engineer intern, applying AI and ML expertise to real-world production tasks within the company's technical team.
- Contributing to the development and iteration of machine learning models and intelligent systems as part of an active internship engagement.

Vice Media of Club FLY

Sept 2022 – Oct 2023

The British University in Egypt

- Directed video production using professional editing software including Adobe After Effects, Premiere Pro, and Sony Vegas.
- Mentored and trained junior students on the fundamentals of video editing, providing structured feedback and hands-on guidance.

GRADUATION PROJECTS

Research Project (RP) — Intelligent Model for User Intention Analysis via Brain EEG Signals

Conducted methodology-focused research on decoding motor imagery intentions from EEG signals. Implemented data processing pipelines using CSP and Riemannian geometry on offline datasets to train an AI model focused on human intention analysis.

■ **Problem:** Raw EEG signals are extremely noisy, non-stationary, and highly subject-dependent, making it difficult to extract consistent motor imagery features across sessions.

✓ **Solution:** Applied Common Spatial Pattern (CSP) filtering combined with Riemannian geometry-based feature extraction to produce session-invariant representations, significantly improving classification stability.

Design Project (DP) — FixZone (AI Car Damage Detection Application)

Co-developed an AI application utilising YOLO segmentation for advanced vehicle damage detection and classification. Integrated a user-facing chatbot and an automated scanning pipeline that instantly generates a comprehensive PDF report detailing damage severity and estimated repair costs.

■ **Problem:** Damage detection accuracy degraded significantly across varying lighting conditions, vehicle colours, and damage types (dents vs. scratches vs. structural damage).

✓ **Solution:** Fine-tuned a YOLO segmentation model on a domain-specific dataset and implemented a multi-class severity scoring system, improving classification robustness across real-world conditions.

PERSONAL AI PROJECTS

JARVIS — Personal AI Assistant Platform

Built an ambitious personal AI assistant platform inspired by Iron Man's JARVIS. Features a cinematic holographic HUD interface, a multi-tier LLM router across Ollama, Claude, Gemini, and OpenAI, always-on voice listening, autonomous agents, plugin hot-reload, retrieval-augmented generation (RAG), web research, semantic memory, and a mobile PWA companion. Orchestrated via a Python FastAPI backend with agent-based computer control.

■ **Problem:** Autonomous agents would falsely report task completion with no real output — for example, a voice command to build a website would return 'done' while no file was ever created.

✓ **Solution:** Engineered an action-tracking layer and output validation gate that verifies concrete artifacts (files, API responses) exist before accepting a task as complete, eliminating premature success reports.

Forge — AI-Powered Fitness & Gym Tracking App

Developed a cross-platform fitness application built with Capacitor and optimised for Google Play deployment. Features include calorie tracking, workout logging, body measurement tracking, and an integrated AI coaching module that provides personalised workout and nutrition recommendations.

■ **Problem:** Providing personalised coaching recommendations without a backend server while keeping the app lightweight and Play Store-compliant.

✓ **Solution:** Integrated an on-device AI coaching module that uses locally stored user history and a rule-based inference engine to generate adaptive recommendations without requiring a live API call.

ACADEMIC & TECHNICAL PROJECTS

Custom Neural Network Implementation

Engineered a binary classification system on the Breast Cancer Wisconsin dataset, designing and optimising both a single-layer perceptron and a multilayer perceptron (MLP) entirely from scratch using NumPy — without any ML frameworks.

■ **Problem:** Standard framework abstractions obscured the underlying mechanics of gradient descent and backpropagation.

✓ **Solution:** Implemented forward and backward passes, weight initialisation, and learning rate scheduling manually, achieving a thorough understanding of how neural networks actually learn.

Attendance Application (Computer Vision)

Built a computer vision application to detect and recognise faces, associate them with names, and automatically store attendance data into a structured dataset.

Bite-Joy Mobile Application

Developed a cross-platform food delivery application with full UI/UX design and backend functionality.

Embedded Water Level Controller

Designed a functional embedded system using Arduino and C++ with LED-based level indication and an automated water pump feedback loop.

TINY/JASON Compiler Scanner

Programmed a lexical scanner with modified logic for accurate tokenisation and specific structural outputs.

Marketing Retail Shop System

Created a comprehensive management system for retail shop operations including inventory tracking and sales management.

Obstacle-Avoiding Car (Electronics)

Designed and built a prototype vehicle that autonomously navigates around physical barriers using continuous sensor input.

Network Protocols Implementation

Implemented server-to-client communication protocols using both TCP and UDP.

X O Game (Digital Design)

Implemented the classic Tic-Tac-Toe game in assembly language, focusing on efficient resource utilisation and low-level logic design.

Address Instruction System

Designed a system utilising register and direct addressing modes to optimise data manipulation and memory access operations.

5-Volt Battery Supply (Electronics)

Developed a hardware circuit to convert AC to DC, ensuring a stable and reliable 5V output suitable for embedded system applications.