

# Ziyad ElFayoumy

☎ (+20) 106 759 3998    🌐 Ziyad-HF    🌐 Ziyad ElFayoumy    ✉ ziyad.h.elfayoumy@gmail.com

## EDUCATION

**Bachelor of Engineering, Cairo University,**  
*Systems and Biomedical Engineering*  
GPA: **3.7/4**      Sep 2020 - Jul 2025

**Graduation Project: Multimodal AI-based Detection and Tracking of Autistic Behavioral Patterns,**  
Developed a system for diagnosing autism spectrum disorder in children, integrating **egocentric vision** for eye contact analysis, **stereotypical behaviors** detection, **graphomotor patterns** assessment, and **LLM-based audio-visual** symptom recognition.

## INTERNSHIPS

**Siemens EDA, Software Engineer Intern** ✍  
Enhanced Design Packager for new QuestaSim release, optimizing performance and usability.

**Siemens Healthineers, Service Engineer Intern** ✍  
Attended training; serviced medical devices onsite;

**Dar Al Fouad Hospital, Clinical Engineer Intern** ✍  
Learned hospital operations, codes, protocols; assisted medical device setup and calibration.

## RESEARCH PROJECTS

**Exploring Cognitive Control via fMRI,**  
*Preprocessing, 1st Level, Higher Level Analysis* ✍  
• Analyzed Flanker Dataset, preprocessing, managing, quality control, & statistical analysis.

**Climate Change Modeling, Math Research** ✍  
• Developed a mathematical model using PDEs to simulate climate change, focusing on Navier-Stokes equation, Presented @ **TCCD** Research day

## SKILLS

- **AI & Data Science:** Data Cleaning & Visualization, Feature Engineering, Machine Learning, Deep Learning, TensorFlow, Scikit-learn, PyTorch.
- **Computer Vision:** Image Processing Techniques, Convolutional Neural Networks, Transformers, Multi-Scale Vision Transformers, OpenCV, YOLO.
- **Natural Language Processing:** NLP Algorithms, Fine-Tuning, Hugging Face, Large Language Models (LLMs), Vision-Language Model.
- **Software Development:** Design Patterns, SOLID Principles, Software Development Life Cycle (SDLC), Code Refactoring, Version Control, Agile.
- **Ubuntu Administration:** Linux, Bash Scripting.
- **Web development:** HTML, CSS, Bootstrap, Django.
- **Mobile Application:** Flutter, Dart.
- **Medical Planning:** AutoCAD, Hospital Design.

## EXTRACURRICULAR ACTIVITIES

**DSC, Head of AI Committee & DL Instructor** ✍

**IEEE EMBS, Clinical Engineering instructor** ✍

**BEAT, HR member, PR member & Event Organizer** ✍

## TECHNICAL PROJECTS

**FitMate: AI-Powered Fitness Trainer, OpenCV, MediaPipe, PyQt5** ✍  
• Delivered real-time feedback, tracking, analysis, and rep counts.

**Pandora BCI: EEG Movement Prediction, DL, Flask, Desktop App** ✍  
• Built a deep learning model to predict patient movements from EEG data, trained on the WAY-EEG-GAL dataset.  
• Deployed the model on a Flask web server with a desktop app.

**VisionVerse, Computer Vision Algorithms** ✍  
• Implemented desktop applications image processing tasks: edge detection, feature extraction, segmentation & face recognition.

**CT Toolkit, Computed Tomography, DICOM, Python, PyQt5** ✍  
• CT reconstruction tool with advanced visualization features.

**MammoCLAE, Mammography, Breast Cancer, CNN** ✍  
• Simulated contrast impact and evaluated it via CNN model.

**Ultrasound Beam Simulation, MATLAB, Python, PyMust** ✍

**Fat-Water Separation Using Dixon Algorithm, MRI Sequence** ✍  
• Developed a Streamlit application for MRI fat suppression using the Dixon algorithm, producing water-only and fat-only images.

**FaceX, Viola-Jones, DeepFace, PCA, OpenCV** ✍  
• Spot on faces, eyes & smiles detecting emotions, gender & age.

**News Classifier, NLP, Machine Learning** ✍  
• Built an NLP-based decision tree model to detect fake news.

**Thyroid Cancer Recurrence, Research Paper, Ensemble Learning** ✍  
• Created an ensemble model with SVM, Decision Trees, Random Forests, KNN, and ANN to get TCR, Reported in research Paper

**Cancer Mortality Rates Model, Data science, Linear Regression** ✍  
• Analyzed link between socioeconomic status & CMR

**SoundScan: Comprehensive Audio Fingerprint Recognition, PyQt, ML, Digital Signal Processing, Desktop Application** ✍  
• Employed a Support Vector Classifier (SVC) for accurate speaker and word recognition using MFCCs as sound feature extraction.

**Graphics Toolbox, Game Graphics, OpenGL, C++** ✍  
• Learned OpenGL for creating graphics, including Shapes & scene creation, animation, developing a Car collision avoidance game.

**TheraPlan, AutoCAD, IEC/IAEA Standards, UI/UX, Budget Model** ✍  
Designed a radiotherapy facility with full systems integration.

**DICOM Volumizer, VTK, DICOM Data Handling** ✍  
• Built a DICOM file volume renderer using VTK and Qt, featuring surface and ray casting rendering with adjustable iso values.

**ADVIA 1800 Prototype, Medical Equipment, Hardware, Arduino** ✍  
• Clinical analyzer for sampling, mixing & photometric analysis

## WORKSHOPS & AWARDS

**ITIDA, Funded by the ITAC Graduation Projects Support Program** ✍

**Dell Technologies, Envision the Future Competition**  
• Recognized among the **top 20** out of 259 senior projects from 77 universities across 20 countries in MENA & Turkey in **2025**.

**STP, Level Up 3.0 Competition** ✍  
• Built a Decision Tree model to predict academic risk of students, Got **3rd Place** on Kaggle Competition.

**GDSC, Machine Learning Workshop and Competition** ✍  
• Participated in a Kaggle NLP competition, Got **1st place**.

**Orange Digital Center, Mobile Application** ✍  
• Learned Flutter, built apps, applied acquired skills in final project.