YASSIEN TAWFIK

SOFTWARE ENGINEER

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PROFILE

Software Engineer with a foundation in biomedical engineering, specializing in machine learning, computer vision, and signal processing. Passionate about building intelligent, research-driven applications with real-world impact. Seeking opportunities to contribute to innovative software projects at the intersection of data and technology.

EDUCATION

CAIRO UNIVERSITY

B.Sc. in System & Biomedical Engineering

2021 - Present

PROJECTS

Oral Cancer Prediction
- Microbiome-based cancer classifier using Random Forest, featuring SHAP explainability and optimized feature selection from TCMA dataset. GitHub Link

Real-Time Patient Monitor
- Live ECG monitoring tool with deep learning-based arrhythmia classification, intelligent alarm logic, and noise-resilient visualization. GitHub Link

Face Recognition with PCA
- Modular face detection and recognition system using Haar cascades and PCA-based embeddings, supporting RGB and grayscale datasets with ROC-based performance evaluation. GitHub Link

Advanced CV & Image Processing Toolkit
- Comprehensive suite of four standalone applications for edge detection, segmentation, image filtering, and feature matching—built with custom algorithm implementations. GitHub Link

Audio Fingerprinting & Recognition System
- Audio recognition and mixing app using spectrogram-based fingerprinting. GitHub Link

Interactive Audio Equalizer & Visualizer
- Equalizer for advanced frequency manipulation and real-time spectrogram analysis. GitHub Link

Digital Filter Designer
- using z-plane zero-pole placement with real-time frequency response visualization. GitHub Link

Beamforming Simulator
- Simulation for analysis in telecommunications and medical imaging. GitHub Link

Dynamic Multi-Channel Signal Viewer
- Desktop application for enhanced medical signal visualization and management. GitHub Link

STM32 Smart Embedded Interfaces
- Embedded suite for display, motor, and sensor control with modular drivers and simulation. GitHub Link

CTG Heart Failure Monitoring System
- Monitors and analyzes HRV and FHR signals to detect health abnormalities. GitHub Link

Hospital Management System
- Developed a secure and comprehensive hospital management system. GitHub Link

TECHNICAL SKILLS

- **Programming:** Python, C++, C, Java, JavaScript, HTML, CSS
- **Machine Learning & Data Science:** Supervised learning, neural networks, feature engineering, model evaluation, SHAP analysis
- **Computer Vision & Imaging:** Segmentation, edge detection, object tracking, SIFT/Haar/Active Contour methods, spectrogram analysis
- **Signal Processing & DSP:** Digital filtering, Fourier & Z-domain analysis, signal reconstruction, real-time visualization
- **Data Analysis & Bioinformatics:** Microbiome profiling, data preprocessing, statistical analysis, TCMA/HOMD datasets
- **Embedded Systems (Basic):** Microcontroller interfacing, GPIO/EXTI driver development, STM32 bare-metal programming
- **Web Development:** Responsive UI design, DOM manipulation, project deployment (basic)
- **Software Design & Architecture:** Object-oriented programming (OOP), modular system design, MVC pattern
- **Databases:** SQL (basic), Firebase (project-based)
- **Tools & Frameworks:** OpenCV, scikit-learn, PyQt5, Jupyter, Git, Proteus, MATLAB

CERTIFICATIONS

- **Frontend Web Development** - HTML, CSS, JS
- **TCCD Research Day** – Presented research on Partial Differential Equations (PDE)

Click Here to see the Certificates

COMMUNITY ACTIVITIES & INTERESTS

Program Ambassador	British Council	2018 - 2020
Swimming Coach	Swimming Star Academy	2020 - 2021
Teaching Assistant	Mr. Omar Sherbiny	2021 - 2022
Operation Room Member	Ministry of Youth and Sports (YLY)
Event Organizer	In The Zone	2023 - 2024
Skydiving Instructor	Al Galaa Airborne	2019 - 2022