

# SAIED SALEM

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## EDUCATION

Faculty of Engineering Cairo University

**B.Sc. Systems and Biomedical Engineering Department**

September 2018 – July 2023

GPA: 3.7

## PROJECT

**Physician support for malignancy score decision in breast ultrasound imaging web app based deeplearning Graduation Project**

[Deeplearning, PACS, DICOM viewer, Automated report generation, CAD system, Django, FastApi, Docker, React.js, Cornerstone.js, Pytorch, TensorFlow, Azure]

- Developed an end-to-end PACS-integrated system for the automatic segmentation and classification of breast cancer ultrasound images using state-of-the-art deep learning techniques
- Integrating the system with a DICOM medical viewer that includes various image processing tools to assist physicians in analyzing malignancy scores

**3D Brain tumor segmentation** [pytorch, tensorflow, Wandb, VAE] [↗](#)

- Fully customized 3d brain tumors segmentation engine that incorporates traditional approaches such as Z-net and DeepLabv3+ and probabilistic approaches like attention Unet with VAE

**Classification of X-ray images with multi-task learning** [tensorflow]

- implementing classification model for 14 different diseases and applying GradCAM to interpret how model learn

**GAN Model for hand written digits generation** [tensorflow, GAN] [↗](#)

- Explaining how GANs works and training mechanism and applying different loss to observe the output changes

**Computer Vision studio** [pyqt, Opencv] [↗](#)

- Computer vision studio that illustrate varies computer vision algorithms such as contours detection hough transform, segmentation algorithms

**Neural machine translation with attention mechanism** [tensorflow] [↗](#)

- Neural machine translation model utilizing LSTM with attention mechanism to convert various date formats into a standardized format

**Speech recognition using word triggering** [tensorflow, pydub, fft, GRU] [↗](#)

- Built a speech dataset by employing DSP concepts, including histogram and FFT, and then utilized a GRU-based model for trigger word detection

**Suicide detection using sentiment analysis** [scikit-learn, nltk, numpy] [↗](#)

- Applying different text-feature extraction like TF-IDF, BOW and Vader with different machine learning techniques like ensample learning

**Medical volume rendering web-app based** [vtk-js, volume, rendering] [↗](#)

- Developed a 3D medical viewer using vtk.js, enabling volume rendering with multiple presets marching cubes

**Digital-filter studio and Real time signal filtering Web-based app** [↗](#)

[ Z-transform, Flask, scipy, danfo.js, plotly.js, b5.js ]

- The application leverages Z-transform concept to construct filters with zeros and poles, capturing the phase and magnitude response then filters real-time input signals and dynamically plots the results in real-time

**Music-Equalizer and virtual instruments** [pyqtgraph, pyqt, fft, scipy] [↗](#)

- Applying DSP concepts for spectrum analysis and instrument manipulations within songs with dynamic visualization

**RTOS-vehicle-direction-and-hazard-controller** [ RTOS, AVR, DIO ] [↗](#)

- Design RTOS-based implementation that employs real-time design patterns for a vehicle direction and hazard indicator control system, effectively managing the vehicle indicator LEDs

## PUBLICATIONS

- Saied Salem, Ahmed Mostafa, Yasien E. Ghalwsh, Manar N. Mahmoud, and Ahmed M. Mahmoud. (Accepted). "Computer-Aided System for Breast Cancer Lesion Segmentation and Classification Using Ultrasound Images" To be presented at the IEEE International Conference on e-Health and Bioengineering EHB 2023 - 11th Edition, Bucharest, Romania, 9-10 November 2023.
- Saied Salem, Ahmed Mostafa, Ommar A. Mansour Yasien E. Ghalwsh, Manar N. Mahmoud, and Ahmed M. Mahmoud. "Deep Learning-Based system architecture for Physician Support in Malignancy Score Decision for Breast Ultrasound Imaging" Journal Article [Manuscript]

## EXPERIENCE

**Astute imaging R&D Engineer**

July 2022 – august 2023

**Working with Astute imaging in our graduation project**

- Design the system's architecture and work flow, integrating it with PACs to automate AI decision-making for new instances from the modality using Orthanc and Fastapi
- Developed a DICOM medical viewer with various measurements and image processing tools for images and videos acquisitions, aiding physicians in their assessments with Cornerstone.js
- Implemented the Segmentation pipeline and achieving the highest dice score on the literature with new hyper parameter optimizations using TensorFlow
- Implemented a configurable breast ultrasound segmentation package for training and deeplearning models using PyTorch, MONAI and WandB

**Treyd Data Scientist Intern**

July 2022 – October 2022

- working on developing human input inspection system, creating data acquisition pip-line with React.js Redux.js ,tesseract.js, Material Ui ,fast API and comparing it with deeplearning field detecting system api
- Design social media data acquisition system and make analysis on them to make better decisions in the company business using Scrapy and Fastapi
- building machine learning model for companies credit limit estimation with Sklearn

## SKILLS

languages : [C/C++](#) [java](#) [Python](#) [Javascript](#)

Software development : [OOP](#) [design patterns](#)

[Fastapi](#) [Flask](#) [SQL](#) [React.js](#) [cornerstone.js](#) [Vtk.js](#)

[Orthanc](#) [Docker](#) [Open-GL](#) [Scrapy](#) [Git](#) [PyQt](#)

Machine learning: [Scikit-learn](#) [Pandas](#) [Pytorch](#)

[Tensorflow](#) [OpenCV](#) [MONAI](#) [WandB](#) [Matlab](#)

Embedded Systems : [Stm32](#) [ARM](#) [RTOS](#)

## CERTIFICATES

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Machine Learning Stanford [!\[\]\(529949c2c3dadbaa4e538e8c643454bc\_img.jpg\)](#)

Deep Learning specialization [!\[\]\(3dfb8d66e81160ad61421a3452093d1b\_img.jpg\)](#)

Introduction to TensorFlow [!\[\]\(99f58673407353e96a019fbca558fd72\_img.jpg\)](#)

AI for Medical Diagnosis [!\[\]\(0f848bbd71cef6b345273b16f905912a\_img.jpg\)](#)

Natural Language Processing specialization [ First , Second]

Object Oriented Programming in Java Duke California San Diego specialization [!\[\]\(a870788d6ed9b8fd294b7654a8c8526b\_img.jpg\)](#)

## EXTRA CURRICULUM ACTIVITY

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**Academy head at BEAT**

- setting and applying general plan for students to enhances their skills

**Mentor at AI Camp**

- creating workshops that guide and teach students how to implement machine learning algorithms that were clarified at the session
- mentoring the assessment of AI tasks and Assist students through the camp