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 deeplearing Graduation Project

[Deeplearing, 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

CT lung Nodule Classification package [pytorch, MONAI, WandB]

- Configurable classification package for 3D lung Nodule CT that incorporates MLOps and Automated-parallel hyper parameter tuning

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

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, Ahmed F. Elnokrashy and Ahmed M. Mahmoud. (**Accepted**). **"Computer-Aided System for Breast Cancer Lesion Segmentation and Classification Using Ultrasound Images"** IEEE International Conference on e-Health and Bio-engineering 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

R&D Engineer at Astute imaging

July 2022 – august 2023

- 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

Data Scientist Intern at Treyd

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

Machine Learning Stanford

Deep Learning specialization

Introduction to TensorFlow

AI for Medical Diagnosis

Natural Language Processing specialization [First , Second, Third]

Object Oriented Programming in Java Duke California San Diego specialization

EXTRA CURRICULUM ACTIVITY

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