Shrief Abdelazeez
Biomedical Engineer

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About me I am a Biomedical Engineer eager to use my experience in this field to serve the community and industry. I got my Bachelor degree from Faculty of Engineering Cairo University, System and Biomedical Engineering Department. My cumulative grade was excellent with honor with GPA 3.9. Then, i have finished my pre-master subjects with excellent grade and GPA 4.0. Finally, i have gotten my master degree in the field of Biomedical Engineering from the Faculty of Engineering Cairo University. My research interests are Machine/Deep learning Algorithms, Artificial Intelligence (AI)Algorithms, Statistical Analysis, Mathematical Modeling, Digital Signal Processing (DSP) Algorithms, Image Processing Algorithms, Control Systems Algorithms, Adaptive Control Algorithms, Stochastic Processes Algorithms, and High Performance Computing (HPC).

Work Experience

July 2021 - present

- Assistant Lecturer at Faculty of Engineering Cairo University, System & Biomedical Engineering Department.
- Senior & Team Lead Control & DSP Algorithm Engineer at BioBusiness Company

July 2020 - July 2021

- Teacher Assistant (TA) and Demonstrator at Faculty of Engineering Cairo University, System & Biomedical Engineering Department.
- Junior Control & DSP Algorithm Engineer at BioBusiness Company

Jan 2017 - Jun 2020

- Teacher Assistant (TA) and Demonstrator at Faculty of Engineering Cairo University,System & Biomedical Engineering Department.
- Senior Calibration Engineer at Medical Equipment Calibration Lab (MECL).

July 2016 - August 2016

- Service Engineer Trainee at Siemens Company.
- Maintenance and installation processes for MRI, CT Equipment.

Training & Courses

Deep learning course from Udacity using Pytorch.

Jan 2015 - May 2015
C++ Course at Smart Apps Company

- Object Oriented Programming Concepts.

- Templates and Standard Template Library (STL).

Aug 2014 - Oct 2014
C Programming Language Under Linux at Smart Apps Company
Working under linux operating environment using c programming language.

July 2014 - Aug 2014
Trainee at El Gomhoria Company

- Monitors.

- Spectrophotometer.

- X-ray.

Education

Master of Science in Systems & Biomedical Engineering at Faculty Of Engineering, Cairo University 2017 - 2021
Title: "Transfer learning based framework for Multi class classifications of breast cancer using Whole Slide Images (WSIs)".

Bachelor Degree - System & Biomedical Engineering at Faculty Of Engineering, Cairo University, 2011 - 2016

- Excellent Degree with honor.

- **Graduation Project**:High Performance Distributed Volume Rendering on Heterogenous Platforms.

- Excellent Degree for Graduation Project.

- My rank is third of class.

- My GPA is 3.9.

Skills

Programming Skills

- C/C++
- Qt Creator
- Matlab
- MySQL
- OpenMP
- OpenCL
- Python
- Pytorch
- Latex
- Git
- CMake

Projects

Projects Associated to BioBusiness Company

1. **DSP algorithms for detection and monitoring of power quality disturbances , 2022**

   - Event disturbances detection such as Transient, Rapid Voltage Change (RVC), Interruption, DIP, SWELL, and frequency.
   - Calculation and monitoring of power parameters such as active, reactive, and apparent power, True power factor, Displacement power factor, Crest factor, phase unbalance, Total harmonis distortions... etc

2. **Desktop application for system calibration of BioVent A-series device using .Net , 2022**

   - Design the front-end user interface for the desktop application
   - Develop the back-end algorithms using .Net framework
   - USB serial communication protocol for transmitting and receiving data between the device and PC

3. **Non-Invasive Ventilator (NIV) Modes, BioVent A-series device project , 2022**

   - Mathematical modeling for Pressure signal driven from the blower used in the device using Matlab (Simulink)
   - Design PID controller to control pressure out from the blower using Matlab (Simulink)
   - Design Continuous Positive Airway Pressure (CPAP) mode algorithm
   - Design Auto-CPAP mode algorithms
   - Design Bi-Level-Spontaneous Positive Airway Pressure (BiPAP -S) mode algorithms
   - Design Bi-Level-Spontaneous and Time Positive Airway Pressure (BiPAP -ST) mode algorithms
   - Design Bi-Level Volume Target (BiPAP -VT) mode algorithms
   - Design Pressure Controlled Ventilation (PCV) mode algorithms
   - Design Pressure Support Ventilation (PSV) mode algorithms
   - Moving Average Low Pass Filter algorithm to get rid of noise associated to the pressure and flow sensors

4. **High Flow Nasal Canula (HFNC) Project, 2021**

   - Mathematical modeling for flow signal driven from the blower used in the device using Matlab (Simulink)
   - Design PID controller to control mix flow using Matlab & C
   - Non-linear mathematical model for oxygen flow signal driven from the proportional valve used in the device using Matlab (Simulink)
   - Design PID cascade controller to control flow driven from the proportional valve using Matlab & C
   - Developing an algorithm in order to detect tube obstruction or disconnection

Projects Associated to Faculty of Engineering Cairo University, System & Biomedical Engineering Department

1. **Master Project, Transfer learning algorithm for multi-class classification of breast cancer whole slide microscopic images using PyTorch, 2019 - 2021**

   - Image preprocessing using Torchvision Package.
   - Image augmentation techniques using ImageDataGenerator in Keras.
   - Use DenseNet201 as a pretrained model and adding my proposed classifier model
   - Using combination between Adam algorithm and step decay scheduler as an optimization technique.
   - Training the model on cloud computing using Colab.
   - Testing the model empirically and achieving average accuracy 95%

2. **Graduation Project, High Performance Distributed Volume Rendering on Heterogeneous Computing Platforms, 2016**

   - An efficient rendering pipeline targeting interactive volume rendering of large scale volumes that are acquired by advanced state-of-the-art medical scanners, and cannot fit on the memory of single rendering device.
   - Multi-GPU framework that is suitable for clinics equipped by Multi-GPU workstations, and for mid-size volumes.
   - Cluster implementation for large radiology stations to handle very large scale volumes.
   - Implemented both sort-first and sort-last parallel rendering techniques to handle different types of processing for different applications.

3. **Computer Vision Project, Face Recognition using Principle Component Analysis (PCA) and Sum of Square Difference (SSD), 2016**

   - Image preprocessing.
   - Extract eigenfaces features using PCA.
   - Use SSD as a classifier.
   - Plotting ROC curve to evaluate the performance of the model.

4. **Bio-statistics Project, ECG binary classification using energy feature extraction and KNN classifier, 2014**

   - Signal preprocessing such as low pass filter to remove the noise.
   - Extract features using energy of the signals.
   - Classify the ECG signal into normal or abnormal using KNN classifier.
   - Evaluate the model based on some metrics such as accuracy, sensitivity, and Specificity.

Publications

1. **Paper in EMBC 2016**: *"Parallel generation of digitally reconstructed radiographs on heterogeneous multi-GPU workstations," 38th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC), 2016.*

2. **Paper in ISC 2015**:*"Speaker Recognition Using MFCC and Vector Quatization," Annual International Student Conference of Biomedical Engineering (ISC), 2015,* 2nd best paper.

Awards

2nd best Paper in the International Student Conference (ISC), 2015
Title:*"Speaker Recognition Using MFCC and Vector Quatization"*

Certificates

- **Master Degree**: Master Of Science in Biomedical Engineering & Systems, 2022 (Link)

- **Sololearn**: HTML Course, 2021 (Link)

- **Test Automation University**: Java Programming Course, 2021 (Link)

- **Bachelor Degree**: Biomedical & System Engineering, 2016 (Link)

Language Skills

1. **Arabic**: Native Language.

2. **English**: Excellent.

3. **Deutsch**: A1.1.

References

References upon request.