TAWFIK MOHAMMED OSMAN

tmosman@asu.edu · https://www.linkedin.com/in/ tawfik-osman-11935b14a · 480-452-6734

EDUCATION:

Electrical Engineering, MSE & B.S.E (4+1)   **Arizona State University**   *GPA: 4.00*
- Ira A. Fulton Schools of Engineering | BSE Graduation May 2020 | MSE Expected Graduation May 2021
- **Awards**: MasterCard Scholars Foundation Scholarship | Fulton Undergraduate Research Initiative(FURI) Funding | Master's Opportunity for Research in Engineering (MORE) Funding
- **Relevant Coursework**: Artificial Neural Computation, Communication Systems, Digital Signal Processing, Detection and Estimation Theory, Digital Circuit Design, Wireless Networks, Communication Networks, Python for Rapid Eng. Solutions.

Electrical & Electronic Engineering, B.S.C.   **Ashesi University**   *GPA: 3.73*
- Honors: First Class Honors | Graduation May 2019

SKILLS:

Programming: Python | MATLAB | R | C&C++ | HTML $ CSS
Design: Cadence | Simulink | Hardware Prototyping & Testing | Microsoft PowerPoint
Statistics: R-Studio | Tableau Software | Microsoft Excel
Libraries: PyTorch | TensorFlow | NumPy | OpenCV | CNN | SciPy | Scikit-Learn | Matplotlib |Pandas | pyQt5 & tkinter
Certification: Deep Learning Specialization in Coursera by Andrew Ng

PROJECTS AND RESEARCH EXPERIENCE:

Master's Opportunity for Research in Engineering (MORE): Graduate Research Assistant   *Spring 2021*
Employing Deep Learning and GPS positioning for Vision-Aided mmWave Beam Prediction in Phased Array mmWave Testbed.
- Interfacing GPS-RTK Board and ZED2 camera to the Testbed using Python Object Orientated Programming, Socket library and SDK.
- Planned to use a Labeling Program in python, to create labeled images dataset in YOLO format, essential for the object detection modelling to be performed in PyTorch.
- Anticipated on building the mmWave predictor model from pre-trained Convolutional Neutral Networks (ResNets) using transfer learning technique, the preprocessed Vision dataset, and the GPS position dataset.

Fulton Undergraduate Research Initiative (FURI): Undergraduate Research Assistant   *Summer 2020*
Leveraged on Deep Learning to build ML Model that can Predict the Optimal Beam Index, Using Wireless Sensing Localization.
- Contributed in coding the Signal Processing blocks implemented in the mmWave Testbed, using modules from UHD Python API.
- Integrated an indoor Positioning System with a mmWave Testbed, using libraries from python and a GUI program from Marvelmind.
- Collected dataset of beam directions and coordinate positions from the mmWave Testbed and preprocessed it, using Pandas library.
- Developed a Multi-layer neural network from scratch using python modules from **PyTorch** framework. The cleaned dataset was used to train the beam predictor model with an inference performance of 98% Top-3 accuracy.

Simulation of Wireless Communication with GNU Radio and MATLAB   *Fall 2019*
Used SDR transceivers to emulate a wireless communication system, by successfully transmitting and receiving a generated sequence of bits.
- Built signal processing blocks such as FFT, & filters. And explored the used of software-based spectrum analyzer from GNU radio
- Implemented basic modulation and demodulation schemes, Phase & Time Offset Correction, and channel estimation with MATLAB.
- Learned to establish the SNR of the wireless channels, using the calculated BER for each the modulation scheme employed.

WORK EXPERIENCE:

Graduate Research Assistant, *Wireless Sensing, Learning, and Communications Laboratory*   *August 2020-Present*
Project: Interfacing a Prototype of Reconfigurable Intelligent Surface (RIS) with a Vision-Aided sub-6GHz Testbed.
- Calibrated and verified the NI-USRP transceiver's maximum power at line-of-sight transmission using Spectrum Analyzer.
- Accomplished the integration of stereo camera sensor, wireless positioning system(GPS), and mm-Wave Testbed with the RIS system, using a Low-level networking interface in python**.**
- Contributed in the generation of codebook for the RIS system using a Reinforcement machine learning algorithm.
- Participated a month-long field test measurement, to verify the performance of the RIS system without computer vision.
- Built a Graphical User Interface(GUI) to monitor image output and signal power received at the receiver base station.

Graduate Service Assistant, *Arizona State University, Tempe-AZ.*   *May 2020 - December 2020*
- Facilitated lab activities in coursework of Digital Design Fundamentals, using Intel DE10-Lite FPGA board to implement logic circuits.
- Supported the ASU Sync modality by assisting a faculty member in organizing and controlling the teaching and learning equipment.
- Successfully Held up to 2 hrs./week sessions to help students with their assignments and projects in Python and Machine learning.

Undergraduate Teaching Assistant, *Arizona State University, Tempe-AZ.*   *January 2020 - May 2020*
- Coordinated and assisted a faculty member in teaching a Python for Rapid Engineering Solution (EEE591) class of 140 students. And 40% of the class had grade A.
- Exploited the Scikit-learn library and utilized its classification algorithms such as Support Vector Machine, KNN, Logistic regression and Perceptron to build an optimized model capable of predicting 98% of counterfeit bills.
- Assisted students to build a CAD Tool Driver Program that utilizes the libraries of Python to generate an inverter-chain Hspice file with an optimized number of inverters and path effort, at a minimum path delay.

Engineering Intern, *Ghana Broadcasting Corporation, Ghana*   *June 2018-August 2018*
- Actively involved in monitoring the strength of Radio Signals received and transmitted within a Town of about 200 square miles.
- Participated in troubleshooting faulty communication equipment and assisted in the technical maintenance activities.