# Mirza Elaaf Shuja

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## EDUCATION

***Masters in Data Science*** 2018 – Present
Information Technology University (ITU) | Lahore, Pakistan 3.33/4.0

***Bachelors in Electrical Engineering*** 2013 – 2017
National University of Sciences and Technology (NUST) | Islamabad, Pakistan

## WORK EXPERIENCE

***Machine Learning Engineer*** Jun 2019 – Present
ADDO AI | Lahore, Pakistan

***Research Assistant*** Mar 2019 – Jan 2020
Information Technology University (ITU)| Lahore, Pakistan

***Firmware Engineer*** Jan 2018 – Feb 2019
BlueEast | Lahore, Pakistan

***Intern*** Jun 2016 – Aug 2016
Ericsson| Lahore, Pakistan

## TECHNICAL SKILLS

- **Machine Learning Techniques:** Instance-based Algorithms ( K-NN, SOM); Regression Analysis (Logistic Regression, Linear Regression); Regularization Algorithms (Ridge Regression, LASSO); Classification (Naive Bayes, SVM, Random Forest, ); Dimensionality Reduction (LDA, PCA, t-SNE); Reinforcement Learning (Q-Learning); Monte Carlo Methods; Association Rule Mining (Apriori); Clustering (DBSCAN, Spectral, Hierarchical, EM-GMM); Deep Learning (CNNs, VGG, ResNet, RNN, LSTM, GRU); Image Segmentation, Object Detection (FCN, UNet, Mask R CNN, YOLO); Generative Methods (Vanilla GAN, CycleGAN, AGCGAN)

- **Languages:** Python; C/C++; JavaScript.

- **Tools and Technologies:** Numpy; Sklearn; Pandas; Tensorflow; Kera; Pytorch; Hadoop; Spark; GCP-AI Platform.

## PROJECTS

### 1. Unsupervised Attention Guided Image to Image Translation

Implementing an Attention guided Cycle-GAN to perform unsupervised image to image translation or Style transfer after training on unpaired image data. [PDF]

**2. Emotion Detection from Face Expression**

Design and train a Haar Cascade + CNN model to classify Facial Expression of Pakistani Talk Shows into emotions and evaluate the bias introduced by the inherent racial bias of training data. [PDF]

**3. Arrhythmia Detection using ECG Classification**

Designed and Trained a Residual CNN to classify ECG waveforms into five different types of arrhythmia using keras with tensorflow backend.

**4. IOT Three Phase Smart Electricity Meter (Final Year Project Bachelors)**

Worked as the Team Lead on the Design and Prototype Development of an IOT capable, 3-Phase, Smart, Budget Oriented Electricity Meter that would serve as a basis for implementing an automated domestic electricity billing system. Designed a 3-Phase Power Measurement Circuit with a current rating of 30A per phase. Used Atmega2560 microcontroller for the measurement of Real, Apparent, Reactive, Instantaneous Power and Power Factor. Established I2C serial communication between the Atmega2560 and nodemcu with Wi-Fi Module ESP-8266 which transmitted data to a ThingSpeak server for analysis. Designed the PCB for the Prototype Electricity Meter testing.

**5. Self-Balancing Robot**

Developed a self-balancing robot using a MPU-6050 (Motion Processing Unit) and Arduino microcontroller. Designed a PID controller against the Yaw, Pitch and Roll of the Robot which controlled the motor drivers.

**6. Artificial Bokeh**

Designed a program in MATLAB to process user provided images and produce varying degrees of Artificial Bokeh using edge detection and filters.

**7. Fire Detection and Alarm System**

Designed a simple fire detection and alarm system using a LM-35 temperature sensor, MQ-2 Smoke Detector and Arduino UNO.

**8. Attendance Management System**

Implemented a student attendance management system in C++ utilizing data encoding and file handling.

## AWARDS AND ACHIEVEMENTS

- 100% Scholarship during Matriculation
- 100% Scholarship during Intermediate
- Bachelors industry adjudged senior design project offered funding for product development NUST SEECS Open House (2017)
- Offered Graduate Fellowship Scholarship during Masters(2019)

## COMMUNITY INVOLVEMENT

- Visiting and distributing basic hygiene kits at Orphanages in Islamabad under the “Ghonsla” foundation and educating them about personal hygiene. (2017,2018,2019)
- Member of the “Street Store” organizing team which provide processed used clothing free of cost to the people in the poverty stricken areas of Islamabad. (2017,2018)

## EXTRA CURRICULAR

- Member of the organizing committee responsible for purchase new stock for “Khaapa” an entrepreneurial project for a course Entrepreneurship.(2017)
- Member of the University House Basketball Team. (2013-2017)
- Member of the SEECS eSports team for DOTA2 and CSGO.
- Swimming, Hiking, Endurance Running.