

# Rafat Ashraf Joy

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## RESEARCH INTERESTS

Interpretable Machine Learning, Generative Models, Time Series Forecasting, Reinforcement Learning

## EDUCATION

Shahjalal University of Science and Technology  
Bachelor of Computer Science and Engineering; GPA: 3.54/4.00

Sylhet, Bangladesh  
Jan 2018 - Dec 2022

## STANDARDIZED TEST SCORES

Graduate Records Examination (GRE) :

Total	Quantitative	Verbal	Analytical
328	169	159	4.5

International English Language Testing System (IELTS) :

Total	Listening	Reading	Writing	Speaking
8	9	8	7.5	7

## EXPERIENCE

Pioneer Alpha  
Software Engineer ML

Dhaka, Bangladesh  
July 2020 - Sep 2020

- Deployed ML models to productions utilizing Flask web framework.
- Got hands on experience with PyTorch framework.

## PUBLICATIONS

- Fine Tuning the Prediction of the Compressive Strength of Concrete : A Bayesian Optimization Based Approach**, in IEEE Xplore. doi:10.1109/INISTA52262.2021.9548593
- An Interpretable Catboost Model to Predict the Power of Combined Cycle Power Plants**, in IEEE Xplore. doi:10.1109/ICIT52682.2021.9491700

## PROJECTS

**osman**: A pip package which lets data scientists/developers oversample class imbalanced binary data by using deep generative models. It offers two APIs, they are: WGAN-GP and Variational Auto Encoder. The APIs were written utilizing PyTorch framework. In future, diffusion model will be added to it

**Super Resolution GAN for precipitation downscaling**: A super resolution GAN based approach for converting low res precipitation data(for south asia region) to its high res equivalent. The low res data is 16\*16 and the high res data is 64\*64. PSNR and SSIM were used to measure the performance

**Snap the Leaf**: This web-app lets the users diagnose the disease of plants just by uploading the image of an infected leaf. Four deep learning models run in the backend of this web app, which will perform the prediction task. One model is Baseline CNN and other 3 models are Transfer learning based (DenseNet, ResNet, ImageNet). The deep learning models were trained using Keras API on Tensorflow Backend.

**Battery Voltage Predictor**: A desktop GUI application built using PyQt5 to predict battery voltage from six features. Two machine learning models run under the hood of the application to make inferences. The machine learning models were trained on DFT calculated voltage data. In addition, the predictions are explained by SHAP, which is a machine learning interpretability library.

## PROGRAMMING SKILLS

**Languages**: Python, Javascript, Scala, C++, SQL, Java

**Frameworks**: Flask, React JS, Express JS, Node JS

**Libraries**: PyTorch, Tensorflow, Scikit-learn, Numpy, Pandas

**Others**: Git, Linux, Latex