Umar Masud

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Education

Jamia Millia Islamia **August 2019 – Present**
Bachelor of Technology in Electronics and Communications (9.44/10 till 4th Sem) *New Delhi*

The Frank Anthony Public School **April 2004 – March 2019**
Science Stream (98%, ICSE 12th) *New Delhi*

Relevant Coursework

- Data Structures
- Database Management
- Computer Architecture
- Digital Signal Processing

MOOC

- Machine Learning: From Basics to Advanced
- Python and Flask Framework

Experience

RESEARCH

University of Surrey **October 2021 – Present**
Research Intern

- Exploring the topic of scene text recognition and text-based VQA at *SketchX Lab @Centre for Vision, Speech and Signal Processing (CVSSP).*

IIIT-Allahabad **May 2021 – July 2021**
Summer Research Intern

- Worked on the topic of "Automatic Detection of Image Splicing", under Prof. Anupam Agarwal, in *Interactive Technologies and Multimedia Research (ITMR) Lab.*
- Did literature review and comparative analysis, implemented five baseline papers from scratch and ran various experiments/simulations, cross-evaluated the SOTA papers with different datasets and out-of-distribution training/testing environments. Concluded a study that the latest methods have an overestimated performance and are unsuitable for real-world applications.

Jamia Millia Islamia **April 2021 – Present**
Undergraduate Researcher

- Working on a problem pertaining to "Facial Mask Detection and Positioning", under Prof. Sarfaraz Masood.
- Designing a research participation form and collecting a dataset from scratch for our purpose. Exploring various benchmark Facial Recognition datasets, literature review and analysis, applying latest Object Detection techniques on a novel sythentic dataset we developed by image stitching using homography matrix for our purpose.

ENGINEERING

Omdena Global **September 2021 – Present**
Junior ML Engineer

- Collaborating in a team of 50+ ML engineers to develop a production-ready deep vision system that uses geospatial data to provide accurate rooftop solar PV analysis, inlcuding factors such as total roof-area, roof obstacles, shadows/solar potential, rooftop material, etc. This project is in association with Rebase Energy.

OPEN SOURCE PARTICIPATION

- Successfully completed the Hacktoberfest'20.
- Contributed in Winter of Code, IIT Kharagpur (kWoC).

Projects

MACHINE LEARNING

Classical ML

- Reproduced 5 papers on the topic Image Forgery Detection that uses hand-crafted features for classification of pristine and tampered images.
- Diabetic Retinopathy Detection using Texture Features and Ensemble Learning (paper implementation). Achieved F1-score = 0.97 and accuracy = 97.2%
- Fog detection in images using GLCM based features and SVM (paper implementation). Got F1-score = 0.83 and test accuracy = 82.3%
- Phishing URL detection system based on URL features using SVM (paper implementation). Achieved F1-score = 0.99 and test accuracy = 99.2%

OpenCV Projects

- *Air-Piano*, an air-based piano enabling the person to play through hand(fingertip) movements.
- *Air-Drum* System, an air-based drum beat generator.
- *Background Color Detection*, uses 2 techniques to detect a suitable background for the input image.

Deep Learning

- Experimenting with different channel descriptors instead of the common GlobalAveragePooling2D in external attention modules such the Squeeze and Excitation block(SE), Convolutional Block Attention Module(CBAM), etc. (ongoing)
- *Background Remover* tool for portrait images of humans, made using a U-Net model trained for semantic segmentation of the image. The model achieved 0.981 IOU-score on test data. Also deployed on a web-app.
- Implemented the paper - Medical image denoising using Convolutional Denoising Autoencoders(CAE). Achieved a loss = 0.106 or Structural Similarity Index(SSIM) = 0.894 .
- Image similarity measure through Siamese network on fashion apparels. Got an evaluation accuracy of 94.2%
- Plant Pathology Challenge, a FGVC8 workshop challenge at CVPR-2021 for multi-label classification of plant leaf diseases. Got 87.34% accuracy with a pre-trained model as feature extractor.

WEB DEVELOPMENT

- *Banking System*, contains a simple banking system that enables to transact between the customers. It uses HTML, CSS, bootstrap, PHP, and MySQL, with the local server provided by the XAMPP.
- As a part of the InnerveSOC competition, designed a complete website template for Innerve Tech-Fest 2020, IGDTUW. **I was the adjudged winner.**

Miscellaneous

SKILLS

Languages: Python, Java, HTML/CSS, JavaScript, PHP
Libraries: NumPy, Pandas, Matplotlib, Sklearn, OpenCV, Keras, TensorFlow, PyTorch, Flask
Database: MySQL, PostgreSQL
Interpersonal: Communication, Public Speaking, Critical Thinking, Team Leadership, Team Management.

POSITIONS OF RESPONSIBILITY

ML/AI Dev - Google Developer Student Club, JMI
Youth Ambassador - HundrED Global Organisaton

AWARDS AND HONORS

5th Summer School of AI 2021 - IIIT Hyderabad: One amongst 500 participants worldwide.
INSPIRE Science Award For Top 1%: Scholarship for Higher Studies by Govt. of India.
Mr. Harbinder Singth Dugal Rolling Trophy: Awarded for Proficiency in Science ISC-XII.
Mr. G W Mayer's Merit Scholarship: Awarded for excellence in Mathematics and Science.
Shanker Sumeda Rolling Trophy: Awarded for Excellence in Academics.