Umar Masud

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Education

August 2019 - Present — **B.Tech ECE,** Jamia Millia Islamia, New Delhi, (9.07/10 till 2^{nd} Sem)

April 2004 - March 2019 — **Science Stream,** The Frank Anthony Public School, New Delhi, (98%, ICSE 12^{th})

MOOC

Mar 2021 (Issued) — Machine Learning: From Basics to Advanced

May 2021 (Issued) — Python and Flask Framework

Oct 2020 (Issued) — Developing Innovative Ideas for New Companies: The First Step in Entrepreneurship, Finance for Startups

Work Experience

Research

May 2021 - July 2021 — **SUMMER RESEARCH INTERN,** IIIT-Allahabad.
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.

April 2021 - Present — **UNDERGRADUATE RESEARCHER,** Jamia Millia Islamia.
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

September 2021 - Present — **Junior ML Engineer,** Omdena Global.
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 potatential, rooftop material, etc. This project is in association with Rebase Energy.

December 2020 - January 2021 — **Web Development & Design Intern,** The Spark Foundation.
Completed two tasks of building a demo-banking system and making a donation webpage with payment gateway integration.

December 2020 - February 2021 — Web Development Volunteer, M.I.N.D.S
Responsible for the development and timely updating of their website.

Open Source Participation

October 2020 - November 2020 — Succesfully completed the Hacktoberfest'20.

December 2020 - January 2021 — 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

- *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.
- Human Emotion Detection, Pneumonia Prediction models.

Web Development

Banking System

- The project 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.

Website Template for InnerveSOC

- 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, PHP, Javascript
Libraries	NumPy, Pandas, Matplotlib, Sklearn, OpenCV, Keras, TensorFlow, Flask.
Database	MySQL, PostgreSQL
Interpersonal	Communication, Public Speaking, Critical Thinking, Team Leadership, Team Management.

Positions of Responsibilty

August 2021 - Present	**ML/AI Dev,** Google Developer Student Club - JMI.
January 2021 - Present	**Youth Ambassador,** HundrED Global Organisaton.

Awards and Honors

August 2021	5**th Summer School of AI** 2021 - **IIIT Hyderabad:** One amongst 500 participants worldwide.
June 2019	**INSPIRE Science Award For Top 1%:** Scholarship for Higher Studies by Govt. of India.
September 2019	**Mr. Harbinder Singth Dugal Rolling Trophy:** Awarded for Proficiency in Science ISC-XII.
August 2017	**Mr. G W Mayer's Merit Scholarship:** Awarded for excellence in Mathematics and Science.
	Shanker Sumeda Rolling Trophy: Awarded for Excellence in Academics.