Amogh Manoj Joshi

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amogh-joshi

Education

University of Mumbai **2018-*Present***
Bachelor of Engineering in Electronics and Telecommunication Engg. *CGPA: 8.11/10*
Junior Year Undergraduate

Publications

Research Interests: Deep Learning, Computer Vision, Medical Image Analysis

[1] **MedDES: A Deep Learning Based Medical Diagnostic Expert Software System** (*Under Review*)
Student Research Competition, 43 rd IEEE/ACM International Conference on Software Engineering 2021
Amogh Manoj Joshi (solo authored)

[2] **Deep Learning Based Approach For Malaria Detection in Blood Cell Images**
2020 IEEE Region 10 International Conference (*TENCON 2020*)
Amogh Manoj Joshi [1], Ananta Kumar Das[2] and Subhasish Dhal[3]

[3] **A Machine Learning Based Bike Recommendation System Catering To User's Travel Needs**
17 th IEEE India Council International Conference (*INDICON*) *2020*
Ananta Kumar Das[1], **Amogh Manoj Joshi [2]** and Subhasish Dhal[3]

Research Experience

- **Indian Institute of Technology Ropar** **Punjab, India**
  Remote Research Intern *Nov 2020 - Present*
  • Working on COVID-19 3D Lung Volume Segmentation through Deep Learning using models like UNet, UNet++, LinkNet with architectural layouts inspired by ResNet, DenseNet, VGG-Net and EfficientNet.

- **Malaviya National Institute of Technology Jaipur** **Jaipur, India**
  Remote Research Intern *May 2020 - Present*
  • Working on COVID CT Scan Image Classification using Deep Learning and Transfer Learning Approaches. Used the official COVID CT dataset by UCSD Research Group.
  • Augmented the training set with horizontal flip, gaussian noise and rotation which boosted the results. Used Imagenet models like ResNet, VGG, DenseNet, Xception by transfer learning.
  • Proposed parallel CNN model outperformed the existing published works on that dataset.

- **Indian Institute of Information Technology Guwahati** **Guwahati, India**
  Remote Research Intern *May 2020 - Aug 2020*
  •Worked on a research project on public Bike Sharing Systems using Machine Learning techniques. Used the official Divvy Bike System Data in our project.
  • Developed a novel bike recommendation system using ML approaches which recommends bikes to the users based on their travel demands.
  • Grouped bikes with similar behavioural patterns using K-means clustering and built a neural network model to predict the best cluster for user's inputs. The model achieved accuracy of 97%.

- **Indian Institute of Information Technology Allahabad** **Prayagraj, India**
  Winter Research Intern *Dec 2019 - Jan 2020*
  •Studied various Biomedical Imaging Modalities like Ultrasound Imaging, Photoacoustic Imaging, MRI.
  • Simulated phantoms of various shapes using K-Wave toolbox in MATLAB.
  • Studied various Image Reconstruction Algorithms like UBP, TR and implemented different simulation techniques like Monte-Carlo Simulation.

Miscellaneous Projects

- **MedDES: The Medical Diagnostic Expert System** **Dec 2020**
  • Developed a medical diagnostic system for medical image diagnosis using deep learning which has 4 diagnostic tests for Malaria, COVID-19, Pneumonia and Brain Tumour. The system also generates a detailed patient report after testing.
  • Built 4 light weight CNN models using Keras and Tensorflow backend, one for each test and were trained on respective official datasets. The highly accurate models have an avg inference time of 84 msecs.
  • For enabling easy access, system was built as a web application using Streamlit and deployed using herokuapp.
- **Image-To-Sketch Translator using CNN** **Oct 2020**
  • Built an image style translator using VGG-19 model with access to intermediate layers using Tensorflow.
  • Set the content weight to 0.01 and style weight to 0.001 and trained the model for 1000 iterations. Used the artworks dataset to obtain sketch images.
- **Malaria Detection from blood cell images using Deep Learning** **July 2020**
  • Built a light CNN model for malaria detection from microscopic blood cells using Convolution, Max Pooling and Batch Normalization layers.
  • Used the official NIH Gov's official malaria dataset. The proposed model trained with 5-fold cross validation outperformed state-of-the-art results with a testing accuracy of 99.44 and AUC of 99.40.
- **Accident Avoidance Alert System For Drivers** **Mar 2020**
  • Worked on an object detection project that detects road signs, vehicles and pedestrians and notifies it to the driver by giving a count of objects detected.
  • The system further uses HC-12 module connected to Arduino for alerting the neighbouring vehicles about the overspeeding vehicle in time. Secured third prize in IEEE Technical Paper Presentation Competition for this project.

Awards and Honors

- Got interviewed jointly by IBM and Coursera Officials for IBM's upcoming video project. Was among the top performers worldwide of IBM's APPLIED AI course on Coursera and got selected for final interview after few selection rounds [2020]
- 3rd Prize in IEEE Technical Presentation Competition 2020 held in my institute for my research work titled **"Accident Avoidance Alert System for Drivers"** [2020]
- My team was ranked among the Top 60 teams among a pool of 1913 participating teams at COVID-19 Hackathon organized by Indian Institute of Technology Bombay for our solution: **COVID-19 App** [2020]
- Volunteered in 11th International Conference on Intelligent Human Computer Interaction (IHCI 2019) as a Research Intern held at IIIT Allahabad during 12-14 Dec 2019 [2019]

Technical Skills

Programming Languages	- Python, C++, Java, HTML
DL/ML Libraries	- Keras, TensorFlow, PyTorch, OpenCV, Numpy, Pandas, Scikit
Image Processing Libraries	- OpenCV, ImageIO, Scikit-Image, Pillow
Software	- MATLAB, Simulink, Jupyter Lab, Pycharm, VS Code

Online Coursework

- Stanford CS 230 (Deep Learning)
- MIT 6S.191 (Deep Learning)
- Stanford CS 231n (Convolutional Neural Networks For Visual Recognition)
- Deep Learning Specialization by Andrew NG (Coursera)
- Medical Image Analysis Specialization by deeplearning.ai (Coursera)