SUMANYU MUKU

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EDUCATION

New York University *September 2021 - May 2023*
Masters, Computer Science
Coursework: Operating Systems, Deep Reinforcement Learning, Natural Language Processing

Delhi Technological University(DTU) *August 2016 - May 2020*
Bachelor of Technology, Computer Science **8.13/10.0**

PUBLICATIONS AND PREPRINTS

Does Data Repair Lead to Fair Models? Curating Contextually Fair Data To Reduce Model Bias - *IEEE Winter Conference on Applications of Computer Vision (WACV) 2022 (h-index=62)*

Artificial Intelligence-Assisted Chest X-Ray Assessment Scheme for COVID-19 - *European Radiology 2021 (Impact Factor: 5.31)*

A Survey of Black-Box Adversarial Attacks on Computer Vision Models - *ArXiv*

EXPERIENCE

Research Assistant, NYU Langone Health *November 2021 - Present*
Currently working with Prof. Sumit Chopra and Prof. Rajesh Ranganath in the intersection of machine learning and healthcare. Specifically, we are trying to reduce the turn around time in MRI diagnosis by analyzing undersampled k-space data.

Research Fellow, Computer Vision Group, IIT Delhi *June 2020 - August 2021*
Devised an Attention based framework for assisting a radiologist in detecting Covid-19. Also, conducted work in the area of data curation techniques for mitigating representational bias. These projects were accepted for publication in European Radiology 2021 and WACV 2022 respectively.

Research Intern, Social Computing Lab, IIIT Delhi *February 2019 - April 2020*
Analyzed Adversarial Attacks for image classification tasks in black-box setting. Developed a black-box adversarial patch attack (**BB-Patch**) by using ZO-AdaMM (**NeurIps 2019**) to optimize Expectation Over Transformation (EOT) and demonstrated its effects in the distracted driving setting.

Summer Intern, ITARD, IIIT Hyderabad *May 2019 - August 2019*
Developed a novel clustering based Question Answering Model for fine grained image classification. The results of this work were used to refine the crop advisory tool, **Crop Darpan**, which was funded by the Department of Science and Technology, India (DST) and Japan Science and Technology Agency (JST).

PROJECTS AND SKILLS

RLCar (Bachelor Thesis)
Proposed a RL based framework *RLCar* for simulating Page Caching in operating systems. Demonstrated the effectiveness of using model free RL algorithms like SARSA, Q-learning over LRU, LFU or CLOCK for maximizing the cache-hit ratio.

Active Learning for Tumor Detection
Implemented popular baselines like Coreset, Max-Entropy, MC-Dropout for Single Class (Malignant/Benign) Active Learning using Faster-RCNN model. The algorithms were compared by doing a FROC analysis at different selection budgets.

Small Tumor Detection
Used TinyFaces Detector (**CVPR 2017**) for small lesion detection in full 4k resolution mammographic scans. This simple experimental setup surpassed SOTA breast-lesion detectors where image scaling obfuscated the lesion context.

Programming Languages: C/C++, Python, R, Julia, Java
Tools: Pytorch, Tensorflow, Scikit-Learn, Scipy, Matplotlib, Seaborn, Numpy, Pandas

POSITIONS OF RESPONSIBILITY

Teaching Assistant for Graduate Level *Intro to Data Science* (DS-GA 1001) course in Fall 2021.
Student Co-ordinator for Indian Conference on Computer Vision, Graphics and Image Processing (**ICVGIP**) 2020.