SUMANYU MUKU

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EDUCATION

New York University *September 2021 - May 2023*
Master of Science, Computer Science *New York, USA*
Coursework: Deep Reinforcement Learning, Natural Language Processing
Delhi Technological University(DTU) *August 2016 - May 2020*
Bachelor of Technology, Computer Science *New Delhi, India*
Coursework: Data Structures, Algorithms, Operating Systems, OOPS, DBMS **8.13/10.0**

SKILLS

Languages: C/C++, Python, Java, Javascript, Julia, R, Ruby, SQL, Bash, PHP
DBMS: MySQL, Oracle SQL, MongoDB, PostgreSQL, Cassandra
Web Technologies: HTML, XML, CSS, React, REST, Jekyll, Bootstrap, jQuery, Django, Node.js, Angular.js
Frameworks: AWS, Azure, Docker, Kubernetes, Git, Jenkins, Hadoop, Spark, SPSS, Tableau, CUDA, Kafka, Maven
Other Tools: Pytorch, Tensorflow, Keras, Numpy, Pandas, OpenCV, NLTK, Matplotlib, Travis CI, OpenAI-Gym

WORK EXPERIENCE

Graduate Research Assistant, NYU Langone Health *November 2021 - Present*
- Working with Prof. Sumit Chopra to accelerate the MRI diagnosis by directly analyzing the under-sampled k-space frequency data.

Machine Learning Engineer, IIT Delhi *June 2020 - August 2021*
- Devised an Attention based framework for assisting a radiologist in detecting Covid-19. Improved the precision of radiologists from **65.9 to 81.9%** and recall from **17.5 to 71.75%** with the aid of this framework.
- Invented a novel data curation technique for mitigating representational bias in object detection models. On an average, reduced model bias by **27%** and enhanced detection performance by **9%**.

Research Intern, IIIT Delhi *August 2019 - April 2020*
- Surveyed Adversarial Attacks for image classification tasks in black-box setting. Formalized a black-box adversarial patch attack (**BB-Patch**) and demonstrated its effects in the distracted driving setting.

Data Science Intern, IIIT Hyderabad *May 2019 - August 2019*
- Developed a novel clustering based Question Answering Model for fine grained image classification. Obtained an accuracy of **83.8%** on CUB, **85.8%** on AwA2 and **82.5%** on aPascal dataset. Incorporated the results of this work to refine the crop advisory tool, **Crop Darpan**.

PUBLICATIONS

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 (h5-index=62)*
Artificial Intelligence-Assisted Chest X-Ray Assessment Scheme for COVID-19 - ***European Radiology*** *2021* (I.F = 5.31)
A Survey of Black-Box Adversarial Attacks on Computer Vision Models - *ArXiv*

PROJECTS

RLCar (Bachelor Thesis)
- Proposed a Reinforcement Learning based framework *RLCar* for simulating Page Caching in operating systems.
- Demonstrated the effectiveness of using model-free RL algorithms by achieving a **2x** performance increase in the cache-hit ratio.

Active Learning for Tumor Detection
- Implemented popular baselines like Coreset, Max-Entropy, MC-Dropout for Single Class Active Learning with Faster-RCNN model.
- Compared the algorithms by doing a FROC analysis with selection budgets from 10-50%.

Small Tumor Detection
- Employed TinyFaces Detector (**CVPR 2017**) for small lesion detection in full 4K resolution mammographic scans.
- Surpassed State of the Art breast-lesion detectors by achieving a sensitivity of **0.85 at 0.1 FPI** on InBreast Dataset.

TEACHING EXPERIENCE

Introduction to Data Science (NYU DS-GA 1001) *September 2021 - December 2021*
- Lead lab sessions, designed assignments and held office hours for clearing doubts and providing feedback to students.

Machine Learning (**NYU CSCI-UA 473**) and **NLP (NYU CSCI-UA 480)** *January 2022 - May 2022*
- Prepared the lecture component, graded homework and mentored a class of **180+** students.

ACHIEVEMENTS

- Ranked in Top 5% in CSE department - fifth and eighth semester with a CGPA of 9.10 and 9.20 respectively.
- Awarded a Fellowship by Science and Engineering Research Board (SERB), India for a period of upto 3 years for conducting research in the area of Computer Vision.
- Coordinated India's biggest conference in Computer Vision - **ICVGIP 2020**.
- Received **media coverage** for our work on Crop Darpan.