Nityanand Mathur

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EDUCATION

Indian Institute Of Information Technology Guwahati — April 2024
B. Tech in Computer Science & Engineering — *Current GPA: 8.15/10*

PUBLICATIONS

CLIPDrawX: Primitive-based Explanations for Text Guided Sketch Synthesis Project
Nityanand Mathur, Shyam Marjit, Abhra Chaudhuri, Anjan Dutta Paper

DiffuseKronA: Param. Efficient Finetuning Method for Personalized Diff'sn Models Project
Shyam Marjit, Harshit Singh, Nityanand Mathur, Sayak Paul, Chia-Mu Yu, Pin-Yu Chen Paper

WORK EXPERIENCE

BOSCH | *Machine Learning Intern* — Jan, 2024 - Present
- Working on improvement of Advanced Driving-Assistance Systems(ADAS) using I2I diffusion models.

University of Surrey | *Research Intern - Dr. Anjan Dutta* | *Project Page* | *Paper* — Jan, 2023 – December, 2023
- Worked on introducing explainability to CLIP-based models using simple primitives, with an LDM-powered initialization for faster convergence. Introduced *Primitive-level Dropout* for noiseless sketch synthesis.

IBM Lab | *Research Intern — Dr. Pin-Yu Chen* | *Project Page* | *Paper* — June, 2023 - December, 2023
- Worked on adding parameter-efficient *Kronecker Product* based adapters to personalized T2I models that are $\sim35\%$ more efficient than SOTA, while generating images with high fidelity and text-alignment.

Osaka University | *Data Science Research Intern — Dr. Manas Kala —*   — July, 2023 - Sept, 2023
- Applied counterfactual machine learning to thermal comfort dataset to simulate the comfort of students in winter conditions to find the impact of clothing, age, grade and gender. – *Work undergoing at univ.*

CogXR Labs | *Computer Vision, MLOps Intern* — Nov, 2022 – March, 2023
- Implemented large-scale image classification algorithms on healthcare datasets with high accuracy.
- Created end-to-end production pipelines using docker containers, DVC, W&B and Pytest

IIIT Guwahati | *Research Intern — Dr. Ferdous Ahmed Barbhuiya* — May, 2022 - August, 2022
- Implemented VisualBERT-based multimodal hateful meme classification on social media.
- Integrated CLIP-based embeddings to improve accuracy from 75% to 81%.

IIIT Guwahati | *Research Intern — Dr. Radhika Sukapuram —* — May, 2022 – July, 2022
- Researched service caching algorithms in edge cloud to maximize the cache hit rate at edge devices.
- Implemented $FIFO, LRU, LFU, GDSF, SCRP$ algorithms for service caching in edge cloud in Java.

PROJECTS

CheXpert | *Python, Tensorflow, Computer Vision, Docker, DVC, W&B, Git* — November 2022
- Implemented a deep learning multi-label classifier to process an 11 GB medical image dataset, classifying X-ray images into 13 disease categories. Later, merged with the Classify-Covid project to add Covid.
- Containerized with Docker. Used DVC for data versioning, W&B for tracking, and hydra.cc for config.

Classify-Covid | *Python, Tensorflow, Computer Vision, Docker, DVC, W&B, Git* — August 2022
- Developed a binary classification model using DenseNet architecture to analyze a substantial X-ray dataset for COVID-19 detection, with 82% accuracy. Containerized using docker dev containers.

CVP | *Python, Pytorch, Segmentation, GANs, Neural Style Transfer* — January 2023
- Implemented U-net based image segmentation for humans & aerial image segmentation to detect roads in a map
- Implemented object localization for food items and neural style transfer using Efficient-net.

Hackathon Projects | *Waste management, Heart-disease detection, Crowd-control* — 2021-22
- Implemented an image classification model/dataset for waste management on a UAV to locate contaminated areas and report it to municipality. **II prize winner, BIT Mesra**

SKILLS

Languages: Python, SQL, Bash, C, Java, HTML, CSS, LaTeX
Frameworks/Libraries: PyTorch, TensorFlow, Keras, Pandas, NumPy, Scikit Learn, and OpenCV
Tools: Docker, Git/GitHub, Unix Shell, PyTest, Weights and Biases, DVC, Hydra.cc, Hugging Face, AWS, Gradio

EXTRACURRICULAR ACTIVITIES

Club Coordinator: Mavericks, ML Club @ IIITG; took hands-on sessions on Machine Learning