

PRAYUSHI MATHUR

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YEAR	DEGREE/INSTITUTE	INSTITUTE/SCHOOL	CGPA/%
2016-2020	B. Tech in Computer Engineering	Nirma University, Ahmedabad, Gujarat	7.34/10
2018-2020	Minor in Finance	Nirma University, Ahmedabad, Gujarat	-
2016	Class XII: RBSE Board	Shiv Jyoti Senior Secondary school, Kota, Rajasthan	87.8%
2014	Class X: CBSE Board	Sophia Girls Senior Secondary school, Kota, Rajasthan	9.8

TECHNICAL SKILLS

- **LANGUAGES:** python, C++, C, MySQL(XAMPP), php
- **TOOLS:** anaconda, pycharm, MATLAB, jupyter notebook, eclipse, XAMPP, spyder
- **LIBRARIES AND FRAMEWORK:** tensorflow, keras, anaconda
- **SYSTEMS:** windows (98/vista/7/8/8.1/10), linux, ubuntu
- **MODELS:** ANN, CNN, autoencoder, GAN

INTERNSHIPS

IIIT-HYDERABAD/ANALINEAR IMAGING SYSTEMS PVT. LTD.: (Nov 2020 – Present) Real-time video superresolution using webcam and thermal camera on NVIDIA Jetson nano.

GOVERNMENT OF INDIA: (Jan 2020 – October 2020) Applying DL techniques on normal satellite imagery and SAR imagery.

WELLNESS SPACE: (May 2019 - June 2019) Worked on TYPE-2 Diabetes(T2D) using ML, focusing on nephropathy. Also, interpreted the nephropathy data by specified parameters and compared it with non-nephropathy data.

INTERNSHALA: (June 2018 - August 2018) Marketing and promoting the internshala by being a part of Internshala Student Partner (ISP) program.

IXIGO: (June 2018 - July 2018) In the ongoing projects, contributed in the research domain. Domains include diverse departments such as growth, technology and Business & Partnerships.

PANTENE: (July 2017 - September 2017) Campus influencer in collaboration with 'Vogue' for promoting and creating buzz around the campaign and generating participation for the contest. Worked closely with Chatterbox Technologies Pvt. Ltd.

SHARKID: (April 2017 - May 2017) Marketing and promoting the startup in the campus.

IIM AHMEDABAD: (Jan 2017 - Feb 2017) Created digital stories for primary school students in the 'Scholars for change campaign'.

CERTIFICATIONS

- **IMAGE PROCESSING AND PATTERN RECOGNITION**
- **DEEP LEARNING**
- **PYTHON**
- **CLOUD COMPUTING**

PROJECTS

REAL-TIME SINGLE IMAGE AND VIDEO SUPERRESOLUTION ON NVIDIA JETSON NANO

Various models such as ESPCN, EDSR, FSRCNN, SR-GAN were trained and tested. End-to-end inferencing pipeline was constructed and deployed on Jetson nano to use it on webcam & thermal camera.

OBJECT DETECTION AND CLASSIFICATION MODEL ON SATELLITE IMAGERY WITH REQUIRED PIPELINE

Fine-tuned the previously built classification model (Inception v3). Object detection model (YOLO v3) was built with the end-to-end pipeline, ready for deployment using AWS, sentinel-hub, geojson.io, planet-lab, tensorflow serving, google earth, google engine, etc.

OCEANOGRAPHIC ELEMENT DETECTION ON SAR IMAGERY

The aim of this project is to detect multiple elements in sea surface using satellite imagery. Those oceanographic elements include: (1) ship, (2) oil spill, (3) look-alike, (4) land and (5) sea surface.

STYLE AUTOENCODER

The idea proposed of the style autoencoder was an alternative approach of Style-GAN (NVIDIA). The results generated by the autoencoder was similar to Style-GAN using less GPU time. The autoencoder was trained on the same dataset which was used in Style-GAN of 128x128 dimensions.

LIVER TUMOR SEGMENTATION

Liver tumor is a single type of tumor. The dataset used for training was LiTS 2017 (Medical Decathlon dataset). The model used was the modified V-net by NVIDIA using autoencoder regularization. The model was trained on NVIDIA V-100, 32GB. The achieved training dice score was 0.945 ± 0.02 .

DIABETIC RETINOPATHY DETECTION

Created a new classification model inspired by existing deep learning classification models. The dataset used was APTOS dataset (kaggle). The clinical data consist of the presence of diabetic retinopathy in each image on a scale of 0 to 4, (0) No DR, (1) Mild, (2) Moderate, (3) Severe, (4) Proliferative DR. The model created successfully reached 0.82 testing accuracy.

MULTIPLE ORGAN SEGMENTATION

The model can segment the following organs in a CT/MRI scan: (1) spleen (2) right kidney (3) left kidney (4) gallbladder (5) esophagus (6) liver (7) stomach (8) aorta (9) inferior vena cava (10) portal vein and splenic vein (11) pancreas (12) right adrenal gland (13) left adrenal gland.

3D GLIOMA BRAIN TUMOR SEGMENTATION ON MRI

Segmentation of glioma tumor from MRI considering 3D volume. Our model trained on BraTS 2018-19 dataset.

DATA GENERATION USING GANs

WGAN-GP was used to make model learn the noise distribution over the image. It can generate noise to make a dataset of noisy images for the further better training of denoising autoencoders and denoising CNN.

TYPE – 2 DIABETES

Worked in Data Mining and Machine Learning on real data collected from a hospital in collaboration. The data was of around 12k patients containing 373+ attributes. It included the triopathy of diabetes i.e. Nephropathy, Neuropathy and Retinopathy. In future, the model may act as an assistant to the doctor which would help in diagnosis of Nephropathy mainly.

DENOISING AUTOENCODER USING GAN

Adaptive Multi Column Stacked Sparse Denoising Autoencoder (AMCSSDA) was used to denoise the image having multiple noises at the same time.

OBJECT DETECTION

YOLO v2/v3 and custom YOLO models were implemented. The dataset used here was COCO, the number of object classes were 80, training and validation images were 80,000 and 40,000 respectively. The model could be implemented on both images and videos. The input images could be of any dimension.

MACHINE LEARNING IN RECOMMENDER SYSTEM

CO-CURRICULAR ACTIVITIES

Joint Secretary (ISTE Student's Chapter), Operational Team Member of Women Development Cell, Singing (Akhil Bhartiya Mahavidhyalaya), MUNing, Marathoner.