Nitin Mukesh
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Examination	University	Institute	Year	CGPA
Post-graduation	IIT Bombay	IIT Bombay	2021	8.08
Graduation	BHU	Institute of Science	2019	9.08

WORK EXPERIENCE

- **AI/ML Engineer II | Technology & Innovation Lab | HERE Technologies** [Apr'22-Present]

Project: Electrical utility asset Identification and consumer mapping (Tata Power)

- Used **Yolov5** to train custom model for electrical utility asset identification on drive and drone data
- implemented **StrongSORT** for tracking the identified objects and integrated the detection and tracking algo
- Created POSTMAN API for inference with detection, tracker, & asset mapping and deployed on **EC2**
- Completed inference on 20 TB of drone and drive data & successfully delivered the output to GIS team

Project: LiDAR data classification using DGCNN

- Implemented **Dynamic Graph CNN** for LiDAR **data segmentation** on German Railway LiDAR Dataset
- Read various research paper on implementation using model like VoxNet, PointNet, GCNN on LiDAR data
- Submitted a **patent** for Gated Community Identification using Graph Neural Network

- **ML Researcher | Analytics & Insight Unit | TCS Research & Innovation lab** [Aug'21-Apr'22]

Project: TCS Zero Carbon Emission

- Fitted **Multiple regression Model** to predict Net carbon emission using various sources like offices, vehicles
- Used **Forward Selection**, **Backward Elimination** & **step-wise regression** to select suitable variable for model

Project: Automating Image pre-processing using Deep Reinforcement Learning

- Implemented Noise detection task in image with **Deep Reinforcement Learning on MNIST** dataset & custom text images dataset using appropriate Reward function and **deep Q-network architecture**
- Achieved accuracy of 99.57% on MNIST images and 97.89% on text image dataset for classifying noise into 3 categories, no noise, Gaussian, Salt & Pepper using Deep RL model & submitted a white paper for same
- Extended this idea to detect different pre-processing from image like **watermark** and **perspective** detection

Project: Noise detection and handling in text-images for OCR

- Implement Noise detection module in Text-images using **Transfer Learning**(ResNet50) in Keras
- **Achieved** accuracy of 96% for classifying images into 3 categories, no noise, Gaussian, Salt & Pepper
- Implemented different **noise removal technique** like, Gaussian Blur, Median Blur, Bilateral Filter, Histogram Equalization and Adaptive HE and **binary Thresholding** for handling noise in the text images

INTERNSHIPS

Machine learning Research Intern, IIIT Allahabad [May'18-Jun'18]

- Trained Autoencoder on MNIST and CIFAR10 dataset and used learned features for prediction using **SVM**
- Made a **web application** for classification of images using pre trained model on CIFAR10 data using Django

ACADEMIC PROJECT

- **Statistical Analysis of COVID-19 Longitudinal Plasma Proteomics Data** [M.Sc. Project, Jan'21-May'21]
  Guide: Professor Sanjeev V. Sabnis *Department of Mathematics, IIT Bombay*
  - Analysed the **COVID-19 Plasma Proteomics** dataset of proteins with two time points, Non-severe & Severe
  - Performed EDA involving **Data Cleaning**, **Normalization** and identified proteins by **Dimension Reduction**
  - Performed **Correlation Analysis** and **Wilcoxon Signed Rank Test** for identifying the biomarker Proteins
- **A Study on Randomized algorithms** [M.Sc. Project, Aug'20-Dec'20]
  Guide: Professor Krishnan Sivasubramanian *Department of Mathematics, IIT Bombay*
  - Implemented Randomized algorithm for **Packet routing in Sparse Network** & analysed by **Chernoff bounds**
  - Implemented **Hamiltonian Cycles in Random Graphs** and used **balls and bins model** for modelling **Hashing**
- **Prediction of Cancer Mortality Rates for US Countries** [Group Course Project, Jun'20-Jul-20]

Guide: Asst. Professor Monika Bhattacharjee *Department of Mathematics, IIT Bombay*

- Fitted **multiple linear Regression** model on the basis of relationship shown by scatter paired plot
- Analysed the dataset to find **Multicollinearity** using **VIF** and handled it using **PCA and Ridge Regression**
- Selected suitable model by **subset selection approach** on the basis of R2, adjusted R2, AIC, and BIC criterion

- **A Comprehensive Statistical Analysis of COVID-19 Outbreak situation in Pune** [May'20-Jun'20]

Guide: Professor Sanjeev V. Sabnis *Department of Mathematics, IIT Bombay*

- Analysed the Pune **COVID-19** patient data using different visualization techniques for period till May 2020
- Performed time series analysis using double, triple **exponential smoothing** and **Box-Jenkins Methodology**
- Compared different **time series** models on basis of RMSE**, AIC & BIC** values & forecasted next 30 days data

- **Online Assignment Submission and discussion Platform** [Jan'19-May'19]

Guide: Dr. Anshul Verma *Department of Computer Science, Banaras Hindu University*

- Made a website in **Django** a python framework for online assignments submission and discussion platform
- Applied **Iterative Model** of Software Development Life Cycle model to develop overall structure of website

SCHOLASTIC ACHIEVEMENT

- Acquired **94.39 percentile** in **IIT JAM** Mathematical Statistics paper conducted by **IIT Kharagpur** [2019]
- Achieved **AIR-11**, Master in Science, Quality Management Science Entrance Exam conducted by **ISI** [2019]
- Cleared **MSc Data Science** Entrance exam conducted by **Chennai Mathematical Institute(CMI)** [2019]
- **Awarded BHU Gold Medal** for getting highest marks in B.Sc.(Hons.) Computer Science [2019]

TECHNICAL SKILLS

- **Programming Languages**: Python, R, C, C++, SQL
- **Web**: Django, Bootstrap
- **MS Office:** MS-Word, MS-Excel, PowerPoint
- **ML Tools:** OpenCV, scikit-learn, Keras, PyTorch
- **Data Visualization:** Seaborn, Matplotlib
- **Data Handling:** Numpy, Pandas, geopandas

COURSES UNDERTAKEN

CORE COURSES	• Regression Analysis • Optimization • Probability Theory	• Statistical techniques in Data Mining • Statistical Modelling • Multivariate analysis	• Data Structure & Algo • Statistical Inference • Time Series Analysis
ONLINE COURSES	• **Machine learning with Tree based Models in Python(DataCamp):** Learned to train **Decision Trees, Random Forest** and tree based model in Scikit-Learn and applied **ensembling methods** • **Introduction to TensorFlow for AI, Machine learning and Deep Learning(deeplearning.ai)** • **Unsupervised Learning in Python:** Learned about PCA, K-means Clustering with Implementation in Python • **Deep Learning & Computer Vision A-Z (udemy):** Learned SSD & GAN using openCV & Keras		

PAPERS & PATENTS

- Novel method to determine gated community using **Graph Neural Network** [2022]
- Spatial Wavelet Dynamic Graph Convolutional Neural network for **LiDAR Segmentation** [2022]
- Nearest Object Tracking for Deep Learning Based Object Detection Algorithm on Low FPS Videos [2022]