



Education

Indian Institute of Technology, Delhi (IIT-Delhi), India

Aug'13 - July'17

Bachelor of Technology in Textiles; GPA: 3.20 (8.01/10.0)

Coursework : Intro to CS.(OOPS), Data Struct.&Algo., Linear Algebra & Diffr'l, Machine Learning, System Designing

Technical Proficiency & Publications

- **Technology:** Python, TensorFlow, Pytorch, OpenCV, NumPy, Pandas, Java, Docker, SQL, OpenVino, Angular
- **Theoretical:** Machine-Learning, Computer Vision, Deep-Learning, Generative-AI, ML System in Production
- **Publication:** Jangale, V; Goyal Himanshu et al.; “Deep Learning based Flare Image Analytics for Emissions Monitoring at the Edge”, 2022 IEEE Int'l Symposium on AdCONIP, Vancouver, BC, Canada, 2022, pp. 269-275
- **Patents:** Co-Inventor of a patent-pending on **Flare Monitoring System and Method** (Application No. US2023/18/114,729) filed on Feb 27, 2023.

Work Experience & Projects

JCI (Acquired FogHorn.io)

Data-Scientist-II

Oct'20 - Present

- **Flare Stack Monitoring For Gas Volume Estimation:** Predicting the volume of Flared gases in oil refinery stacks via visual monitoring. Real-time reporting of quality of Flaring activity based on volume estimates of Smoke & Flare.
 - Trained **Mask R-CNN** with Resnet-101 backbone for Mask-segment'n problem on Multi-GPU setup with **64mAP**.
 - Trained & Experimented with other Mask-Segmentation models like EfficientDetD7x and DeepLab as part of POC.
 - **Conversion & Optimization** of mask model for running in a computationally deprived, **Non-AVX Intel** system.
 - Presented the published paper in AdCONIP 2022, SFBAY meetup. Patent-pending on technique developed.
- **Optimal Start For HVAC System:** Start time prediction for BMS to reach desired Air conditions at given time.
 - Worked on continuously-Trained & site condition adaptable ML system to predict HVAC start time for smart BMS.
 - Developed **Energy-Saving-Estimation framework** using various available sensors data from BMS. Worked on **Grafana, InfluxDB, Docker** for exploratory data analysis & visualization.
 - On deployed site, system was expected to have **Saved \$1Million** in a year, which is ~7% of total incurred bill.
- **Selective Target Updation:** Training a DL model only for selective output classes w/o affecting other classes.
 - Developed **new training method** to improve accuracy on subset of output classes & train model on partially labelled dataset. **Modified Focal Loss Definition** such that loss is calculated based only on prediction of specific classes.
 - Tested this technique on Hand Digit Recognition Task & AutoML OD model with COCO rare classes Datasets.
 - Trained model had **20% Gain in mAP** from non-modified model with random weight initialization. But significant drop in Object Detection model precision was observed compare to fully class aware training.
- **Drill Rig Monitoring For Blow Out Prevention (BOP):** Real time BOP state prediction for preventing catastrophic failure preventing large-scale oil spillage, also providing crucial analytical parameter of drilling via video surveillance
 - Trained **EfficientDet-D3 OD** model using various Novel image augmentation technique, optimized model using **OpenVino kit** to run inference in Intel based edge device, Multi Object **Tracking using Kalman Filter** approach.
 - Developed a **Robust Image Augmentation Pipeline**, later integrated across other computer vision projects.
 - Implemented and experimented on **Faster R-CNN** (with Inception & ResNet-50/101 backbone architectures), performing hyper-parameter optimization during **Transfer Learning**.
 - Post-training **Quantization:** using **tensorRT** for GPU inferencing & **OpenVino** for CPU inferencing.
 - Project received **IoT Edge Computing Excellence Award 2021** for implementing edgeAI in remote drilling site.
- **Exploratory Projects:** Various POC projects for process improvement & feasibility testing
 - Developed efficient **GPU Utilization Strategy** which optimizes concurrent usage of GPU by multiple models deployed in Edgectl® docker container.
 - Implemented SoTA **Copy-Paste Augmentation Technique** (ranked #1 in OD(Object Detection) task in 2021) to improve accuracy on rare classes. Created **Rule Based Accuracy Matrices** reporting Framework.
 - **CycleGAN** implementation for converting synthetic image to real looking image in unsupervised settings.

- Created a **Face-recognition** based **IOT surveillance system** to track and authenticate user entry in indoor gated communities. The system ported directly into any IoT camera, and thus did not create any extra hardware costs.
- System utilizes a pre-trained **MTCNN + FaceNet** based architecture to output 128-dimension face-embedding.
- System generated and showcased critical analytics like footfall time heatmap, mood of users, user serving time etc. due to the automation of authentication system.

Citigroup, Pune

Technical Analyst

Aug'17 - Oct'19

- **SeaShell- Object Storage System:** Developing a low-cost, object-based, file storage and retrieval system used for file archiving. Worked on Java SpringBoot/MVC for Microservices API, Angular for UI and mongoDB for database.
- **Trade Imaging and Messaging System (TRIMS) Recommendation Engine:** Envisioned, developed and deployed a machine-learning powered recommendation system to assist employees doing data entry from trade documents. The solution increased the efficiency for specific fields by up to 75 %.
- Received **Citi Applause Award & Citi Silver Award** recognizing individual contributions for various initiatives.

College Projects & Internship

Under-Graduate

Aug'13 - July'17

- **Verbocuary:** Developed a vocabulary building Android app. This allowed user to learn words in order of importance for a given exam. Developed the word ranking algorithm by analysing a large corpus of exam related content.
- Automated the process of marking microscopic fibre boundary in a yarn cross-section image via Computer Vision. Implemented CNN model was able to distinguish different kind of fibres, marking boundaries with an R value of .95
- Developed **Transliteration tool** for Vernacular Languages using a Tries based Decision-tree model which converted text from one given language to other trained languages.
- Implemented **ML algos from scratch** i.e. Linear, Logistic Regression, CNN, Bayesian Network etc. Utilized these network for Hand written Digits Recognition task, Text classification Task etc.

Certifications & Recognition

- **Deep Learning Specialization**

Coursework : Neural-Network & Deep-Learning, Hyper-Parameter Tuning & Regularization, CNN, Sequence Model

- **ML Engineering for Production (MLOps) Specialization**

Coursework : Data Pipeline, Modeling Pipeline: Model Arch. Searching & Quantization, Model Deployment in Prod

- **Interests** Gyiming, Playing Badminton, Running, Adventure-Sports, Swimming, App Dev., Open-Source contribution