HIMANSHU GOYAL

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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 & Difrt'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, DS&A, Application Arch. & System Designing
- **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:** Developed CV based system for monitoring Flared-gas's volume and flaring quality based on Smoke & Flare detection in image. Trained **Mask R-CNN** with **Resnet-101** as backbone for Mask-segmentation problem on Multi-GPU setup with **64 mAP**. Performed conversion & optimization of mask model for running in a computationally deprived, **Non-AVX** Intel edge. Presented the published Paper in AdCONIP & SFBay conference.
- **Optimal Start For HVAC System:** Start time prediction for HVAC system to reach desired Air conditions at required time, reducing system runtime. Developed continuously-trained & site condition adaptable ML system that can save energy & maintain comfort. **Saved $1Million**/7% of annual electricity bill on deployed site at Hillsborough school
- **Drill Rig Monitoring for Blow out Prevention (BOP):** Developed solution to monitor the optimal moment for closing the drill valve during a blow-out, preventing devastating oil spillage. Trained a **Faster R-CNN**(with Inception ResNet-50 backbone) OD model with **0.95 precision** that monitor drilling activity. Developed a **stable production - level system** by employing methodologies like Kalman Filter-based **Object Tracking**, **Model quantization** using tensorRT for GPU inferencing OpenVino for CPU inferencing, and using augmented images in model training. Project received **IoT Edge Computing Excellence Award 2021** for implementing edgeAI in remote drilling site.
- **Selective Target Updation:** Developed a **new DL training method** that enables training the DL-model exclusively for selective rare classes. Modified **Focal Loss** function definition such that loss is calculated only for rare classes. Trained **EfficientDet** model and achieved **20% Gain in mAP** on COCO dataset rare classes.
- Developed efficient **GPU Utilization Strategy** for optimizing GPU concurrent usage by multiple models deployed in Edgeml® docker container. Selected among **top-10 semi-finalist** for organisation wide Tech-Challenge-2023 in JCI.
- Implemented **CycleGAN** to convert synthetic images to real-looking images in unsupervised settings.

TwoPaksh Tech, Pune — Co-Founder — *Oct'19 - Sep'20*

- Created a **Face-recognition** based **IOT surveillance system** to track and authenticate user entry in indoor gated communities. System utlized a **MTCNN + FaceNet** model running on user device to output 128-d face-embedding hence avoiding video streaming to cloud. Generated useful analytics like footfall time heatmap, mood of users, user serving time etc on this data.

Citigroup, Pune — Technical Analyst — *Aug'17 - Oct'19*

- Developed a low-cost, object-based, file storage system using **Java SpringBoot/MVC** for Microservices API, **Angular** for UI and mongoDB for database.
- Developed an ML powered **recommendation engine** to assist employees in data entry from trade documents. Predicting the value for fields with **0.9 precision**. Received **Citi Applause Award** & **Citi Silver Award**.

College Projects, IIT-Delhi — Under-Graduate — *Aug'13 - July'17*

- 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 during summer intern project at SmallDay Services.
- 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

- Coursera: Deep Learning Specialization, ML Engineering for Production (MLOps) Specialization (MLOps), CitiGroup: CFA-Level-2 cleared, Engineering Excellence level-2