Deepti Rawat

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Education

PhD Scholar, IIIT-H **January 2023 – Present**

Center for Visual Information Technology (CVIT) *Hyderabad, TS*

- Mentor: Dr. Ravi Kiran Sarvadevabhatla.

IIMT College of Engineering **August 2014 – July 2018**

Bachelor of Technology in Electronics and Communication Engineering *Greater Noida, UP*

- Aggregate: 78.7% (2nd rank in the overall department).

Publications

RoadSocial: A VideoQA Benchmark for Road Event Understanding from Social Video Narratives

Conference on Computer Vision and Pattern Recognition (CVPR), 2025

- Authors: **Deepti Rawat**, Chirag Parikh, Rakshitha R.T. Tathagata Ghosh, Ravi Kiran Sarvadevabhatla

DashCop: Two-Wheeler Traffic Violations Detection Using Dashcam Videos

Winter Conference on Applications of Computer Vision (WACV), 2025

- Authors: **Deepti Rawat**, Keshav Gupta, Aryamaan Basu Roy, Ravi Kiran Sarvadevabhatla
- Project Page: DashCop

MyEye2Wheeler: A Two-Wheeler Indian Driver Real-World Eye-Tracking Dataset

IEEE International Conference on Intelligent Transportation Systems (ITSC), 2024

- Authors: Bhaiya Vaibhaw Kumar, **Deepti Rawat**, Tanvi Kandalla, Aarnav Nagariya, Kavita Vemuri

Experience

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Data Scientist - Computer Vision *CIE, IIIT-Hyderabad, TS*

- Led and mentored a Data Science team of 3 individuals, ensuring seamless coordination with cross-functional teams. Conducted in-depth research to deliver robust computer vision products with high precision.
- Developed and maintained complex computer vision products like Intelligent Traffic Monitoring System, E-commerce Cataloging, Real-time Crowd Monitoring & Behavioural Analysis, and COVID Compliance Monitoring solutions.
- Developed and fine-tuned multiple object detection algorithms (YOLO, SSD), classification algorithms (ConvNext, ResNet), Multi-object Tracking algorithms (DeepSORT, StrongSORT, SORT), background segmentation algorithms (MODNet, U-Net, FBA Matting, Grabcut).
- Optimized models with ONNX, TensorRT, TorchScript, TFLite, DeepStream and OpenVino. Deployed on edge devices (Nvidia Jetson, Raspberry Pi) as well as on cloud platforms (AWS) and reduced processing time by 30% while maintaining accuracy.

Council of Scientific and Industrial Research - CEERI **March 2019 – October 2020**

Research Assistant *Pilani, Rajasthan*

- **Driver Drowsiness Detection with Behavioural Features using Deep Learning Techniques**
  As a part of the Intelligent Systems Group, I contributed in the development of a custom CNN architecture for a multimodal drowsiness detection system based on yawning using YawDD, FER dataset and achieved 97% accuracy.
- Technologies: Computer Vision, CNNs, Transfer Learning, OpenCV, MTCNN, Dlib, Keras, Tensorflow, Python.
- **Remote Vital Health Surveillance System for Elderly Care**
  Designed a multimodal device for the acquisition of vital health parameters of patient comprising temporal signals like ecg, emg, gsr, heart rate and temperature. Deployed a basic android and web solution for the visualisation of the signals. Participated in field trials to check the product performance with real patients.
- Technologies: Microcontroller Programming, Web Development, Database Management.

Central Electronics Engineering Research Institute **July 2018 – December 2018**

Research Trainee *Pilani, Rajasthan*

- Implemented UART communication protocol for data communication from gas-sensor microcontroller (ATMEGA32) to Bluetooth module (HC-05) and WiFi module (NodeMCU).
- Delivered an android based GUI for visualising gas sensor's status.
- Employed NoSQL database to store WiFi-fetched gas sensor's data in realtime.
- Technologies: Atmega32 Microcontroller, Android Development, PCB Designing (Proteus).

Projects

Intelligent Traffic Monitoring System (ITMS)

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- Developed deep learning model for Vehicle detection with 1M+ instances for 15+ vehicle categories with 98% accuracy.
- Developed algorithm for Automatic Number Plate Reader (ANPR), resulting in a 20% increase in accuracy compared to previous methods.
- Implemented a detection model using image-processing methods, deployed it on Raspberry-pi for Adaptive Presence Monitoring in real-time achieving 95% accuracy in day-time and 80% in night-time.
- VehiScan: Engineered complete AI solution for traffic monitoring includes Classification and Counting of vehicles, and capturing traffic violations like Red Light, Stop Line, Triple Riding, and No Helmet Violations with CCTV cameras.
- Achieved real-time inference performance for multiple streams on Jetson Xavier using Deepstream SDK. .
- Analysis Captured: Violation type, Violation video (3-6 sec), Images of violating vehicle, License plate number.
- Technologies: Image processing, YOLO, DeepSORT, OpenCV, Pytorch, TensorRT, Deepstream.

Image Similarity and Image Tagging in E-Commerce

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- Developed a multi-model-based smart tagging system for E-commerce plateforms to generate attributes for an image like Category, Color, Style, Pattern, Gender, Age, Neck, sleeves with added features of the background removal of images.
- Implemented efficient pipeline for an unsupervised learning-based Image Similarity model to fetch similar results as the input image from large database. The resulting system improved search functionality with an accuracy of 85%.
- Technologies: YOLO, Unsupervised Learning, Clustering (KMeans, KNN), Embedding generation(VGG-16, ResNet), Background Extraction (Swin Transformer, U2-Net, MODNet).

Crowd Monitoring and Behavioural Analysis System

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- Covid Compliance Monitoring: Developed a robust solution to detect Face Mask, Hairnet and Social distance in real-time with high precision in constrained environments with a simple CCTV camera stream. Optimize the system to run efficiently on the mobile app with TFLite.
- FlowSense: Engineered a system for people flow management providing analytics for queue wait time, people occupancy and intrusion detection & alert generation.
- Designed and implemented a Facial Attendance System utilizing emotion analysis to provide valuable insights into individual emotions.
- Technologies: YOLO, SORT, OpenCV, ConvNext, Openvino, Mediapipe, Face-recognition, TFLite.

Finalists in Telangana Forest AI Grand Challenge **July-August 2022**

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- Developed a system for Forest AI Challenge that includes identifying animal species, human intervention, and vehicle movement monitoring in forest areas. Generating Analytics to forecast animal locations in regions.
- Technologies: Object detection and segmentation, OpenCV, Exploratory Data Analysis and Visualization.

Technical Skills

Languages: Python
Deep Learning Architectures: MLPs, CNNs, ANNs, LSTMs, Transformers
Deep Learning Framework: Pytorch, TensorFlow, Keras, ONNX, TensorRT
Web Framework: FastAPI, Flask
Libraries: OpenCV, PIL, Pandas, NumPy, SciPy, Matplotlib, SKlearn, Dlib, Mediapipe, Imgaug
Tools: Git, Github, Gitlab, Docker, MLFlow, AWS, DeepStream SDK

Achievements & Certifications

Completed several 10K races, including the Ageas Federal Life Insurance Run (2023), IIIT-H Women's Day Run (2024), NEB Women's Day Run (2023), IIIT-H 25th Anniversary Run (2023), 6th Edition of NEB Sports Run (2022), and Global Cancer Run (2022).

All India Ideathon Kavach Competition: Secured first position by presenting an Innovative Idea and Business model, in All India Ideathon Kavach Competition, funded by Ministry of MSME, Govt. of India (2020).