Dinkar R Sharma

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Data Scientist owning end-to-end Computer Vision systems, from problem formulation and model development to real-time inference pipelines and production deployment.

EXPERIENCE

Khel.AI **June 2025 – Present**

Data Scientist *Noida, India*

- **Ball Tracking for Cricket DRS:** Built an end-to-end ball tracking system by training **custom CNN models** and fine-tuning detection architectures on cricket match footage. Automated frame-by-frame trajectory inference, reducing per-decision latency from **90s to 45s**.
- **Analytics Engine (Trajectory, 3D Pitch Map & Beehive):** Designed and shipped an analytics engine that generates per-delivery insights for every ball bowled, including **full-trajectory tracking**, **3D pitch maps**, and **Beehive ball-impact points**. Output powers broadcast graphics and post-match review.
- **Real-time Player Tracking:** Designed and deployed a real-time player tracking pipeline using deep learning–based detection and **multi-object tracking**, delivering live spatial analytics for broadcast overlays and post-match review.

PROJECTS

Semantic Segmentation with DINOv2 Vision Transformer | DINOv2, ViT, Semantic Segmentation

- Implemented semantic segmentation on **Pascal VOC 2012** using a **DINOv2 Vision Transformer** backbone with a custom multi-scale decoder.
- Applied **pyramid pooling**, skip connections, and boundary refinement for accurate pixel-wise classification across 21 categories.
- Utilized combined **CrossEntropy** and **Lovász** loss for mIoU optimization, with class balancing and data augmentation.
- Achieved **87.9% pixel accuracy** on validation data.

Multilingual Sentiment Analysis with LoRA and LLaMA 3.1-8B | LoRA, LLaMA 3.1-8B

- Fine-tuned the **LLaMA 3.1-8B-Instruct** model for **multilingual sentiment analysis** across 13 Indian languages using **LoRA** for efficient training.
- Processed and tokenized the dataset with **Hugging Face Transformers** for improved model performance.
- Optimized memory usage using **LoRA** to fine-tune model components efficiently.
- Leveraged **Hugging Face** for model training, evaluation, and prediction generation.

Speech Deepfake Detection for 16 Indian Languages | WavLM, Audio Classification

- Fine-tuned **WavLM-large**, a self-supervised audio model, to detect AI-generated speech across 16 Indian languages.
- Processed 33K+ audio samples with feature extraction and padding techniques for optimal model input.
- Applied contrastive and supervised learning strategies to boost model effectiveness.
- Evaluated performance using the **ROC-AUC** score, optimizing for accurate synthetic speech detection.

FloraFaunaNet: Image Classification | Python, PyTorch, Vision Transformer, Deep Learning

- Fine-tuned a pre-trained **Vision Transformer (ViT)** model to classify images of flora and fauna across **10 biological categories**.
- Focused on optimizing the model's F1 score, achieving a high performance with improved **precision**, **recall**, and **AUC-ROC** scores.
- Implemented mixed-precision training and multi-GPU support to improve model efficiency during training.
- Utilized **PyTorch** and **torchvision** libraries for model training and validation.
- Trained and validated the model on a custom dataset of flora and fauna images, optimizing hyperparameters for best performance.

Low Light Mosquito Detection and Classification | Python, YOLO, Object Detection, mAP

- Fine-tuned a **YOLOv8** model to detect and classify six species of mosquitoes in low light conditions.
- Implemented data preprocessing, label management, and dataset splitting techniques to handle training and validation datasets.
- Optimized the model with hyperparameter tuning, achieving a high Mean Average Precision (mAP) score for accurate detection.

Low-Light Denoising & 4x Super-Resolution with RCAN | PyTorch, RCAN, Image Processing

- Implemented a pipeline for joint **image denoising and 4× super-resolution** using a Residual Channel Attention Network (RCAN).
- Trained the RCAN model on synthetically degraded images from the DIV2K dataset for low-light and noisy conditions.
- Achieved significant improvements in PSNR and SSIM over baseline methods on degraded image recovery.
- Visualized enhanced output alongside noisy inputs and ground truth to demonstrate qualitative performance.

Crime Category Prediction | Python, Scikit-learn, Data Analysis

- Developed a machine learning model to predict crime categories, leveraging **Scikit-learn** for data preprocessing and model building.
- Optimized and implemented **Random Forest** and **XGBoost** classifiers, achieving an accuracy of **95.82%**.
- Conducted Exploratory Data Analysis (EDA) to uncover trends and patterns, using **Matplotlib** and **Seaborn** for data visualization.

SKILLS

Core Expertise: Machine Learning, Computer Vision, Deep Learning, End-to-End Model Development
Machine Learning & CV: PyTorch, TensorFlow, OpenCV, YOLO, Scikit-learn, Vision Transformers
NLP & LLMs: Transformers, BERT, GPT-style models, LLaMA, LoRA, Hugging Face
Inference & Deployment: Inference Pipelines, FastAPI, Flask, Model Optimization
Languages: Python, SQL, Java, JS
Tools & Platforms: Git, Linux, VS Code

EDUCATION

Indian Institute of Technology Madras **2021 – 2025**
BS in Data Science and Applications *Madras, India*

The Aryan International School **2018 – 2020**
AISSCE *Varanasi, India*

EXTRACURRICULAR

Deep Learning Research Reading Group
Participant & Organizer

- Organized and contributed to weekly deep learning research discussions, summarizing key insights and sharing knowledge with peers.

Indian Institute of Technology Madras **Sept 2025 - Present**
Viva Examiner

- Conducted viva evaluations for the course *Deep Learning Practice (BSDA5013).*
- Conducted viva evaluations for the course *Deep Learning and Generative AI (BSDA2001P).*