

NABIN KUMAR UPADHAYA

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SUMMARY

Passionate Machine Learning Engineer with expertise in AI-driven solutions, deep learning, and generative AI. Demonstrated success in developing innovative AI solutions, including BirdRecon, an AI-powered bird species recognition tool. Proficient in Python, scikit-learn, and TensorFlow with certifications in Microsoft Azure AI and Oracle Cloud. Skilled in predictive modeling, data analysis, and computer vision, dedicated to creating impactful AI-based solutions.

KEY SKILLS

- **Programming Languages & Tools:** Python, TensorFlow, PyTorch, Matplotlib, LangChain, SQL, FAISS
- **AI/ML & LLMs:** Machine Learning, Deep Learning, Large Language Models (LLMs), Intelligent Agents
- **OS & Misc.:** Ubuntu (Linux), Windows, Git, Office tools

PROFESSIONAL EXPERIENCE

BISAGN | Gandhinagar

AI/ML/IOT Intern

Jan '25 - Present

- **Built** an automated geospatial agent that takes user files and queries, uses an LLM to generate GDAL commands, and returns results via Docker—**fully hands-free**.
- Completed **rooftop segmentation** using **DeepLabV3** and **U-Net**, achieving **96% accuracy** in detecting rooftops from satellite imagery
- **Implemented** an OCR pipeline using Tesseract to process PDFs by auto-orienting each page and performing accurate text extraction.
- **Leading** the development of LLM fine-tuning, RAG pipelines, and agentic workflows to enable scalable, intelligent task automation.

Infosys Springboard | Remote

Machine Learning Intern

May '24 - Jul '24

- Enhanced image caption accuracy by **9%** through meticulous text preprocessing using **NLTK** and **Spacy** tools
- **Implemented image preprocessing techniques**, **enhancing model generalization** and optimizing feature extraction from images
- Elevated caption accuracy through iterative performance assessment and optimization by developing and training multiple models (**CNN+RNN**, **CNN+LSTM**, **VGG/ResNet**)
- Utilized **BLEU**, **METEOR**, and **CIDEr metrics** to assess model performance and ensure high-quality generated captions

PROJECTS

BirdRecon: A Free Open Source Tool for Image based Bird Species Recognition

- **Launched BirdRecon**, an open-source tool for bird species recognition, achieving **95% accuracy** using an **ensemble model** for image classification through **mobile** and **web interfaces**
- **Engineered backend** with **Flask** and **TensorFlow Lite**, integrating **Google Gemini** and **Wikimedia Commons APIs** for enriched species identification and supplementary information
- Utilized Azure services to launch the backend on Azure infrastructure, supporting **scalable processing for 500+ active users worldwide**

Employee Turnover Analytics

- **Created** a data pipeline for predicting turnover, applying SMOTE to balance classes, resulting in a **15% accuracy boost**
- **Segmented** employees into **4 risk zones** using K-means clustering on satisfaction and evaluation scores for targeted retention efforts

- **Tested** three models with cross-validation, achieving **85% ROC-AUC** on final model and enabling data-driven turnover mitigation

SPAM Classification

- Developed a spam detection model using **Deep Neural Networks (DNN)**, achieving **95% accuracy** and **93% F1-score** on the test set.
- Improved model performance by implementing **cross-validation**, **hyperparameter tuning**, and **addressing class imbalance** with **SMOTE** and class weighting.
- Delivered a production-ready solution that reduced **misclassification errors by 30%** compared to baseline models.

EDUCATION

Vellore Institute of Technology | Andhra Pradesh, IN

BTECH - Computer Science and Engineering with Specialization in Artificial Intelligence

Aug '20 - May '24

- **CGPA:** 8.3/10

CERTIFICATION

- Professional Certificate Program in Generative AI and Machine Learning | iHUB DivyaSampark @ IIT Roorkee
- Oracle Cloud Infrastructure 2024 Generative AI Certified Professional | Oracle
- Master Data Science with Python | Great Learning
- Microsoft Azure AI Fundamentals | Microsoft