Rajeev Ranjan Pratap Singh

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Education

VIT Bhopal University **October 2022 – April 2026**
Bachelor of Technology in Computer Science and Engineering (Specialization in AI & ML) *Bhopal, Madhya Pradesh, India*
CGPA: 8.52/10

Technical Skills

Programming: Python, Java, React.js,Tailwind, HTML, CSS, Node.js, MySQL.
Machine Learning & Deep Learning: TensorFlow, Keras, Scikit-learn, NumPy, Pandas, OpenCV, CNNs, ResNet, DenseNet, CBAM, LangGraph, LangChain.
Version Control & Tools: Git, GitHub, Jupyter Notebook, VS Code, Power BI, MongoDB, PyCharm, Excel.
Cloud Platforms: AWS.

Projects

Diabetic Retinopathy Detection
Python, TensorFlow, Keras, DenseNet-121, CNN, OpenCV, Pandas **January 2025 – April 2025**

- Engineered a **Diabetic Retinopathy detection framework** using **DenseNet-121 with custom CNN layers**, achieving **80% diagnostic accuracy** across **5 severity levels** and improving **F1-score by 3%**.
- Enhanced and augmented **3,662+ fundus images** from the **APTOS 2019 dataset**, applying **contrast normalization, resizing, and augmentation**, boosting dataset diversity by **40%**.
- Trained the model for **40 epochs** with **batch size 32** using **Adam optimizer (LR=0.0001)**, improving performance metrics and ensuring robust generalization.
- Automated workflows with scripts for **data classification, verification, training, and inference**, generating **classification reports and predictions** for transparent AI-driven healthcare deployment.

Brain Tumor Detection Using AI
Python, ResNet50, DenseNet121, CNN, OpenCV, Streamlit **October 2024 – December 2024**

- Developed an AI-based MRI tumor classification system using **ResNet50 and DenseNet121 with custom CNN layers**, reaching **99.69% accuracy** across **4 tumor types (Glioma, Meningioma, Pituitary, No Tumor)**.
- Structured and preprocessed **7,023 MRI images** (resizing, normalization, augmentation), improving generalization and reducing overfitting by **18%**.
- Optimized model training with **Adam optimizer (LR=0.0001)**, batch size **32**, and early stopping across **25 epochs**, improving precision, recall, and F1-score consistency.
- Launched a **Streamlit web application** allowing clinicians to upload MRI scans and receive diagnostic support, reducing report turnaround time by **48 hours**.

Emotion Detection System
Python, OpenCV, TensorFlow/Keras, NumPy **August 2023 – November 2023**

- Designed a **real-time facial emotion recognition system** leveraging **CNN and OpenCV**, yielding **80% prediction accuracy** across **7 emotion categories** for live video streams.
- Refined and supplemented **10,000+ facial images** (grayscale, resizing to 48×48, normalization), reducing misclassification by **15%**.
- Streamlined inference in live video streams, cutting latency by **25%** with Haar Cascade face detection and efficient NumPy pipelines.
- Integrated webcam and video file input with overlays, enabling real-time emotion labeling and reporting for practical deployment.

Achievements

- Secured **Top 50 National Rank (out of 5,000+ participants)** in the **Zelestra X AWS ML Ascend Challenge – 2nd Edition**, demonstrating expertise in **machine learning and applied AI solutions**. 2025
- Awarded **2nd Place** in the university-level **Robotics & Coding Workshop** at VIT Bhopal, designing and implementing projects with **Arduino, Python, and algorithm development**. 2024

Certifications

Google Analytics Certification – Google 2025–2026 *Scored 86%; Web Analytics, Data Tracking, Reporting*

Google Ads AI-Powered Performance Certification – Google 2025–2026 *Scored 91.3%; Ads Performance*

Generative AI using IBM Watsonx – IBM Cognitive Class 2025 *Generative AI, Machine Learning*