

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

P rogramming: 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