

ANSH SINGH

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SUMMARY

Results-driven Data Scientist and ML Engineer specializing in end-to-end AI lifecycles. Expert in architecting computer vision (CNNs) and NLP solutions, backed by strong MLOps proficiency (MLflow, Docker, AWS). Proven ability to transition complex models from research into scalable, production-ready REST APIs.

EDUCATION

Vellore Institute of Technology, Chennai (VIT Chennai)

Bachelor of Technology in Computer Science and Engineering |

2023–2027

TECHNICAL SKILLS

- **Languages:** Python, SQL, C++, C, Java, JavaScript (ES6+), TypeScript, Bash
- **Data Science & Analytics:** NumPy, Pandas, Matplotlib, Seaborn, Statistical Modeling, EDA, Data Preprocessing
- **Machine Learning & AI:** Scikit-learn, Deep Learning, NLP, Computer Vision, TensorFlow, PyTorch, LightGBM
- **MLOps & Cloud:** MLflow, DVC, Docker, AWS (EC2, S3, CodeDeploy), CI/CD, Model Registry
- **Backend & APIs:** Node.js, FastAPI, RESTful APIs
- **Databases & Tools:** MongoDB, MySQL, PostgreSQL, Redis, Git/GitHub, Postman, Linux

PROJECTS

PlantGuard-AI | Python, TensorFlow, CNN, ResNet-50, Matplotlib

[GitHub Repository]

- Designed a high-accuracy deep learning system to detect crop diseases across multiple plant species using custom CNN architectures and ResNet-50 transfer learning, achieving **96% validation accuracy**.
- Built species-specific pipelines with targeted data augmentation strategies (rotation, flipping, scaling) to enhance model generalizability and reduce class bias.
- Delivered an **8% accuracy improvement** over the baseline CNN through architecture refinement and augmentation tuning.

Brain Tumor MRI Classification with Attention Mechanisms & XAI | TensorFlow, Keras, CNN, SE/CBAM Attention, Grad-CAM, Colab, cuda, anaconda

[GitHub Repository]

- Classified brain tumors (glioma, meningioma, pituitary, no tumor) from MRI scans across **12 model variants**, achieving peak test accuracy of **98.00%** (DenseNet121 + SE attention).
- Benchmarked SE, CBAM, and hybrid attention mechanisms across three CNN backbones to quantify each module's contribution to classification performance.
- Validated model explainability using **Grad-CAM** with ROAD metric scoring (mean: **0.4205**), confirming clinically relevant anatomical focus across all tumor classes.
- Engineered a reproducible dual-environment pipeline (**local GPU + Google Colab**) with a custom checkpoint callback resolving a **TensorFlow 2.10** serialization bug.

Comment Sentiment Analysis | NLP & MLOps | LightGBM, MLflow, DVC, AWS, Docker

[GitHub Repository]

- Designed an advanced Natural Language Processing pipeline utilizing **NLTK** and TF-IDF vectorization (10k features) to train a highly optimized **LightGBM** classifier for multiclass sentiment analysis.
- Established a strict **MLOps workflow**, utilizing **MLflow** for hyperparameter tracking and model registry, alongside **DVC** for data version control and pipeline orchestration.
- Containerized the inference application using **Docker** and successfully deployed a scalable Flask API to **AWS (EC2, CodeDeploy)**, enabling real-time batch predictions and temporal visualization.

COURSES & CERTIFICATIONS

[Certificate]

- DevOps Fundamentals — IBM (Coursera) · July 2025 **[certificate]**
- DevOps, Agile and Design Thinking — IBM (Coursera) · July 2025 **[certificate]**
- Structured Query Language — University of Colorado Boulder (Coursera) · Feb 2025 **[certificate]**
- JavaScript Basic — Geeks for Geeks · April 2025 **[certificate]**

ACHIEVEMENTS

- **Competitive Programming:** Solved **500+ problems** (LeetCode, GFG, Codeforces); **Max Rating 1700+ (Top 10% Globally)**.
- **Contest Rank:** Secured **Global Rank 944** in Leet Code Biweekly Contest 162 and 848 in Biweekly Contest 159.
- **Community:** Finalist at **FlutterSprint Hackathon 2K26** · **Google Developer Club**; active participant in EU Code Week, contributing to open-source web accessibility tools
- **Soft Skills:** Strong communicator with cross-functional team collaboration experience.