

Sameep Kumar Singh

AI Engineer — Computer Vision / Lightweight Deep Learning

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Profile

AI engineer specializing in lightweight CNN architectures, medical imaging, and model optimization for limited-resource environments. Experienced in designing EfficientNet-based tumor detection models, ESRGAN pipelines, and interpretable deep learning systems. Strong foundation in PyTorch, computer vision, and full-stack ML development, with a published research paper achieving 95.54% accuracy on a 7,023-image MRI dataset. Comfortable building end-to-end pipelines from preprocessing to evaluation, deployment, and interpretability.

Skills

Deep Learning: CNNs, EfficientNet-B0, ESRGAN, Grad-CAM, Transfer Learning, Model Compression

Frameworks: PyTorch, TensorFlow, Keras

Computer Vision: OpenCV, Image Augmentation, Super-Resolution, ROI Analysis

Programming: Python (primary), C/C++, SQL

Tools: Git, NumPy, Matplotlib, Scikit-learn

Other: Experiment tracking, Data Visualization, UI/UX fundamentals

Projects

Lightweight CNN for Brain Tumor Detection (EfficientNet-B0)

2025

- Designed a customized EfficientNet-B0 architecture for 4-class MRI tumor classification: Glioma, Meningioma, Pituitary, and No Tumor.
- Trained on a 7,023-image Kaggle dataset combining Figshare, Br35H, and SARTAJ MRI sources.
- Implemented a full augmentation pipeline: rotation (30°), shearing, affine transforms, color jitter, horizontal flips, normalization.
- Achieved **95.54% accuracy**, outperforming SVM (81.48%), Fine-KNN (91.1%), and recent ensemble approaches (92%).
- Reported class-wise performance:
 - Glioma: 95% F1
 - Meningioma: 91% F1
 - No Tumor: 98% F1
 - Pituitary: 96% F1
- Added Grad-CAM for explainability and clinical interpretability.
- Generated ROC curves and confusion matrices to validate robustness across classes.

ESRGAN-Based MRI Enhancement Pipeline

2025

- Built ESRGAN-based MRI super-resolution pipeline to sharpen low-quality MRI scans.
- Improved feature visibility for tumor localization without altering medical authenticity.
- Integrated attention-based interpretability to correlate enhanced regions with clinical markers.
- Demonstrated quality gains using SSIM/PSNR improvements (reported during experimentation).

Publication

EfficientNetB0-Based Lightweight Customized CNN for Brain Tumor Detection
16th International Conference on Computing, Communication and Networking Technologies (ICCCNT)

Jul 2025

- Developed a lightweight EfficientNet-B0 architecture optimized for low-resource MRI diagnosis.
- Achieved **95.54% accuracy** on a 7,023-image MRI dataset with robust 4-class performance metrics.
- Included Grad-CAM, ROC-AUC, loss/accuracy curves, and detailed augmentation methodology.
- Compared performance with prior techniques and demonstrated measurable improvements.

Technical Experience

AI Engineer (Independent / Research-focused Work)

2024–2025

- Engineered complete medical imaging pipelines, including preprocessing, augmentation, deep model training, evaluation, and visualization.
- Tuned EfficientNet-B0 and ESRGAN architectures using transfer learning, hyperparameter optimization, and early stopping.
- Built reproducible training loops and experiment logs for accuracy/loss tracking and comparison.
- Implemented model interpretability techniques for clinical clarity (Grad-CAM, attention maps).
- Ran performance benchmarking across multiple architectures and optimization schemes.

Other Experience

Klaviyo Manager
Email Designer — GREY

Non-AI work summarized to maintain technical focus.

Aug 2025 – Present
Jun 2024 – Jun 2025

Education

B.Tech in Computer Science Engineering
C.V. Raman Global University
Class 12 (NEB Board) — GPA: 3.12/4.0
Class 10 (SEE Board) — GPA: 3.25/4.0

2021–2025
CGPA: 8.08/10

Awards

SII Scholarship — Full tuition and hostel coverage (merit-based).