Brain Tumor Classification: GAN-Diffusion-Based Classification

Research-Oriented | GANs | Diffusion Models | DDPM (Aug-Nov 24)

• Developed an optimized CNN achieving 90% accuracy on the initial dataset and 94% with transfer learning on an augmented dataset.

• Balanced the dataset using augmentation techniques, increasing total images to 4,500.

• Generated 1,500 synthetic images using DCGAN and DDPM each, creating two distinct datasets of size 6,000 images each.

• Achieved 98.22% accuracy on the GAN-augmented dataset and 98.95% accuracy on the DDPM-augmented dataset using the optimized CNN.

• Compared GAN and DDPM datasets, with DDPM showing better accuracy and generalization.

• Implemented Explainable AI using Grad-CAM to visualize class activation maps, highlighting regions of input images that the model focused on during training.

For more details, visit the project here:

[Brain Tumor Classification](https://huggingface.co/spaces/azeemkhan417/BrainTumor/tree/main)