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## *Brain tumor segmentation and classification from mri images using deep learning*

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## **Abstract:**

Medical science is a challenging area for various problems associated with health care and there always exists scope for continuous medical research. The major challenges in medical imaging are in the region of lesion, segmentation and classification of tumors in the brain. Several technical challenges exist in the classification due to the variation in the tumor size, shape, texture information and location. There is a need for automatic identification of high-grade glioma (HGG) and lower-grade glioma (LGG). The management and grade of brain tumor depend on the depth of the tumor. Due to its irregular features, manual segmentation involves longer time and also increases the misclassification rate. Inspired by these issues, this automatic deep learning network is called the U-Net-based deep convolutional network. To improve the overall efficiency of the network, data augmentation is applied in both training and validation. The proposed U-Net based Convolutional Network architecture is compared with the performance of other architectures and concluded that the proposed U-Net produces a higher dice value. The validation results have revealed that our proposed method can have better segmentation efficiency. Also, the performance of the proposed U-Net achieved better results compared with the state-of-the-art algorithms.

## **Keywords:**

Brain tumour segmentation, Brain tumour classification, U-Net, Deep learning, Convolutional neural network, MRI, Neural networks