



PROJECT REPORT
CLASSIFICATION OF BRAIN TUMOR DISEASE
TYPES BASED ON RADIOLOGICAL IMAGES USING
CONVOLUTIONAL NEURAL NETWORK ALGORITHM
WITH VGG – 16 ARCHITECTURE

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ABSTRACT (ABSTRACT TITLE)

Brain tumors require quick and accurate diagnosis, as they are one of the highest risk diseases. The limited ability of medical personnel to read radiological images accurately is one of the challenges in classifying brain tumor disease types based on radiological images. The solution that can be done to overcome this is to perform image classification using Convolutional Neural Network with VGG – 16 architecture. The method that will be applied starts from collecting radiology image datasets obtained from Kaggle with a total of 7153 images divided into three parts, namely training data, validation data, and test data in each part consisting of four classes, namely glioma tumor, meningioma tumor, pituitary tumor, and no tumor. Next, the training data will go through image preprocessing processes such as Gaussian Blur, Histogram Equalization, Adaptive Histogram Equalization, and Contrast Limited Adaptive Histogram Equalization. The model that has been built using the Convolutional Neural Network algorithm with VGG – 16 architecture will be trained using a variation of the number of epochs including 5, 10, 15, and 20, the performance generated by the model will be evaluated using Confusion Matrix and Classification Report which contains precision, recall, and f1 – score value. Based on the results obtained, the classification of brain tumor disease types based on radiological images using the Convolutional Neural Network with VGG – 16 architecture proved to be effective. This is evidenced by the highest level of accuracy produced by the model on test data is 97.00% when training using training data that goes through the Gaussian Blur preprocessing process with the number of epochs 15. In addition, the preprocessing technique and the number of epochs used can be one of the factors that affect the performance of the model.

Keyword: Image Classification, Convolutional Neural Network, VGG – 16, Gaussian Blur, Histogram Equalization, Adaptive Histogram Equalization, Contrast Limited Adaptive Histogram Equalization