ABSTRACT

A brain tumor is a collection of unneeded cells that grows in the brain or in the center of the spine. Magnetic resonance imaging (MRI) is one method that can be used to detect disorders that occur in the brain's nervous tissue. Brain tumor images are used by doctors as a tool for diagnosing patients because they can provide information and descriptions that explain the patient's condition, but to manually identify the type of brain tumor suffered, thus allowing errors in the MRI results. Therefore, technology is needed that can assist doctors in identifying the type of brain tumor efficiently.

This study uses a convolutional neural network (CNN) algorithm to process magnetic resonance imaging (MRI) image datasets. Classification of brain tumors is divided into 4 classes, namely no tumor, glioma, meningioma, pituitary. The dataset used in this study uses public brain tumor data obtained online through Kaggle which contains 7022 images in jpg format.

In this study, a brain tumor type identification system was created using CNN, then analyzed the parameters that affect system performance based on the influence of the optimizer, learning rate, and batch size. Parameters used to evaluate system performance are accuracy, precision, recall, f-1 score, and loss function. From the test results, the best model was obtained with the Adamax optimizer, learning rate 0,001, batch size 64, and iteration of 100 epochs with early stopping. With an accuracy of 97%, a precision value of 96%, a recall value of 96%, and an f1-score of 96%.

***Keywords**: Brain Tumor, Convolutional Neural Network, Magnetic Resonance Imaging*