ABSTRACT

Cancer is a heterogeneous disease that can attack all parts of the body. Cancer is caused by the abnormal and uncontrolled growth of body cells, resulting in damage to body tissue and the potential to cause death. Cancer is a type of malignant tumor that attacks the body, one of which is the brain. Every year there are 300 brain tumor patients in Indonesia, both adults and children. Generally, doctors use two methods to diagnose these tumors, namely: biopsy and magnetic resonance imaging (MRI). Although the use of biopsy is quite accurate in identifying brain tumors, the time required is relatively long, reaching 15 days. While using MRI is relatively fast, the resulting accuracy is low and depends on the experience of medical personnel. This research aims to develop a method for diagnosing brain tumors using MRI images to make it faster and more accurate. The method used in this research was a deep neural network with a convolutional neural network (CNN) architecture layer. This method was chosen because deep learning has the advantage of pattern recognition with a high level of accuracy and is directly proportional to the number of datasets. This study used a dataset of 300 MRI images with two-dimensional (2D) axial imaging. The metrics used as a basis for the performance of the deep neural network model are accuracy, sensitivity, specificity, precision, and dice similarity coefficient with the results of each metric, namely: 99.3%, 98.6%, 98%, 98%, 98.3%. The research results showed that a deep neural network can speed up the diagnosis of brain tumors with high accuracy within 0.2 seconds.

Keywords : machine learning, deep learning, brain tumor detection, CNN