ABSTRACT

Alzheimer's Diseases (AD) is a brain disease that causes memory loss, decreased ability to think and speak, and changes in behavior. Over time, Alzheimer's disease can make sufferers unable to perform daily tasks. Alzheimer's disease generally occurs in someone over the age of 65. The cause of Alzheimer's disease is still unknown, but genetic changes inherited from parents are thought to increase the risk of this disease, besides that protein abnormalities in the brain are thought to damage healthy nerve cells in the brain. This factor causes the need for tools for medical personnel to detect the symptoms caused by this disease. The process of identifying and classifying images from Magnetic Resonance Imaging (MRI) results that are accurate requires experts and a qualified detection system.

In this Final Project, CNN is implemented on MRI images. MRI data is divided into two, namely training data and test data. The architecture used is a convolutional neural network consisting of 5 hidden layers for feature extraction with output channels 8, 16, 32, 64, and 128 on each layer. For classification, softmax activation is used to classify into non-demented, very mild demented, mild demented, and moderate demented conditions.

The amount of data tested in this study totaled 1430 MRI images which were divided into 1144 training data and 286 test data. System performance will be measured by analyzing the effect of image size, optimizer, learning rate, epoch, and batch rate. The results obtained in the test using the best results from each scenario with an image size of 224×224, optimizer adam, learning rate of 0.0001, epoch 80, and batch size obtained an accuracy rate of 92%, a precision level of 94%, a recall of 92% , and an f1-score of 93%.

Keywords: *Alzheimer's Disease*, *Convolutional Neural Network, hidden layer, learning rate, batch rate, resize.*