

## ABSTRACT

Alzheimer's disease has a high risk in humans who are in old age. In 2015 it was estimated that people with this disease reached 6.5% of the elderly population in Indonesia. Therefore, it is estimated that people with Alzheimer's disease increase by 12 thousand people per year with the presence of population growth factors. This increase caused by the need for tools which medical personnel have in knowing the symptoms caused by the disease. The process of identifying and classifying accurate magnetic resonance imaging (MRI) images requires experts and qualified detection system.

In this final project, CNN will be implemented on a two-dimensional MRI image. MRI data is divided into two parts, which is training data and testing data. The architecture used was Convolutional Neural Network which consists of four hidden layers with 64, 128, 256, and 512 output channels on each layer. At the classification stage, the softmax activation function is used to classify into non-demented, very mild demented, mild demented, and moderate demented conditions.

The amount of data used in this study were 964 which was divided into 720 training data and 244 testing data. System performance will be measured by analyzing the effect of the output channel, number of hidden layers, optimizer and learning rate. The results obtained in optimal conditions has values of accuracy, precision, recall, and F1-score, namely 86,48%, 88,87%, 88,85%, and 88,79%, respectively. The optimal value is obtained from the highest accuracy with results that are not overshooting.

**Keywords:** Alzheimer Disease, CNN, output channel, learning rate, optimizer.