

Abstract

Development of biomedical science has encouraged a lot of research done to produce a computer-based diagnostic tool. One of them is the detection of brain tumors by using the image of Magnetic Resonance Imaging (MRI). MRI examination aims to find morpologik characteristics (location, size, shape, extension, etc.). In general, stage of brain tumor can be classified into two categories, namely Benign and Malignant. Benign tumors of the brain tumor is a stage that is not cancerous or may not spread to other body tissues whereas Malignant tumor is the tumor stage is very dangerous because it can spread to other body tissues. [1]

In this thesis, the images produced by MRI equipment will be processed into several major stages, namely: preprocesing, featur extraction, and classification. Preprocessing the aims which aims to eliminate some of the information or unwanted noise to the feature axtraction. Feature extraction is the process of simplifying the amount of data used to represent a large data such as images composed of pixels accurately^[10] The method used at the stage of feature extraction using Independent Component Analysis (ICA). ICA will be done on the calculation method which will produce an Independent Component / free components that can represent an image data. The results of this process which will serve as input to the process of classification. Classification is a process to categorize the data based on its characteristics. The method of classification used is the Multi Layer Feedforward Networks - Backpropagation that will be used to classify the types of abnormalities of brain tumors into three classes (benign, malignant, and normal).

In this thesis, There are 2 models of the composition of the data training, data validation, and data test to obtain the maximum system accuracy. The first model with the composition of the data 27 trainees (30%), 27 data validation (30%), and 36 test data (40%). The second model with the composition of the data 54 trainees (60%), 18 data validation (20%), and 18 test data (20%). With the first model obtained an average value of the accuracy of the data train, validation, and test accuracy of 89.62% with the highest reaching 100%. Whereas the second model obtained an average value of the accuracy of the data train, validation, and test accuracy of 93.33% with the highest reaching 100%.

Keyword: *Magnetic Resonance Imaging, Brain, preprocesing, featur extraction, classification, Independent Component Analysis, Multi Layer Feedforward Networks – Backpropagation,.*