ABSTRACT

Cataracts are an abnormality in the eye in the form of turbidity or blurring on the lens caused by the breakdown of proteins or other materials so that it prevents the reception of light by the eyepiece. Cataracts are the biggest cause of blindness among other causes of blindness. The prevention can be done through early detection. Generally the detection of cataracts is done by examining the pupil using a slitlamp, where detection in this way is very limited because it can only be done by ophthalmologists and devices that are not owned by all hospitals. In this final project, a design analysis of a cataract detection and classification system is carried out so that cataract detection can be carried out easily and analyze system performance from the results obtained from previous studies.

In this final project, training data and test data are used in the form of pupil eye images for normal conditions, immature cataracts, and maturity, then the Principal Component Analysis (PCA) method, Gray Level Co-Occurance Matrix (GLCM) and Back Propagation Artificial Neural Network . The PCA method is a feature extraction method that can identify patterns by classifying the intrinsic structure of the characteristics of an image and decomposing the image data. The GLCM method is a statistical-based feature extraction method used to obtain features from an image where these features will be used at the classification stage. Where as ANN is a classification method used to classify test data in normal, immature cataract, or mature conditions.

The results of this study are cataract detection systems that are able to detect and classify them into three types, namely normal eyes, immature cataract eyes, and mature cataract eyes with accuracy at 86,66%.

***Keywords**: Cataract, Principal Component Analysis (PCA), Gray Level Co-Occurance Matrix (GLCM), Back Propagation Artificial Neural Network (ANN)*