

## ABSTRACT

In this world there are many eye diseases. One of them is a dangerous glaucoma. Glaucoma (Glaucoma) is damage to eyesight due to increased pressure on the eyeball that is caused by an imbalance between the production and disposal of the fluid in the eyeball. As a consequence will damage the delicate neural networks in the retina and behind the eyeball, so will cause decreased function of vision. One method of diagnosis of glaucoma disease is by measuring the airy vision. Damage to the delicate neural networks can be monitored manually by observing and analyzing the retinal image of an eye fundus cameras by the expert eye doctors (ophthalmologist).

Observing and analyzing the retinal fundus image manually sometimes produces a diagnosis that is less objective and accurate. To assist Physicians in diagnosing eye experts, this final project were underway. In this final task implements the science of image processing in early disease detection of glaucoma based on optic nerve head segmentation of retinal fundus images. Thus is expected to yield a more accurate diagnosis, objective and efficient.

In this final project, a software designed to detect optical discs then determine the radius and coordinates of the optic disc cup and calculate the ratio of the disk / optical disc. Methods used include thresholding, regional filtering, cropping, and morphological processes.

Based on the results of the simulation, the system showed promising results with accuracy of the system is 93.33% which can be seen from the results of the classification with the normal threshold value of less than 0.35, Glaucoma  $0.35 \leq r \leq 0.7$ , and more than 0.7 Blind. Error generated by the system at 6.67%. This system can detect optic disc with precise image of the 30 tested, 26 successfully detected optical disc image with the right, or as much as 86.67%. This system shows the results of system accuracy 93,33% and 6.67% of error which can be seen from the results of the classification with the K-Nearest Neighbor with the value  $k = 7$  using Euclidean Distance method.

Keywords: Glaucoma, Optic nerve head, optic disc, cup disc, regional filtering, thresholding