

ABSTRACT

One of the cardiovascular diseases that can interfere with eye vision is glaucoma. This disease is caused by high pressure on the inside of the eyeball to cause blindness slowly. In general, screening or early diagnosis can help prevent glaucoma, specifically by analyzing several eye components affected by pressure, including the optical disc, optical cup, and blood vessels. Thus, by blending machine learning algorithms and computer vision technology, glaucoma classification and identification can be accelerated and improved. This study applied the Invariant Moment method to extract the optical cup and blood vessel segmentation's shape, scale, and rotation features. To obtain segmentation results for these two objects, we threshold two image datasets, DrishtiGS-1 and REFUGE, and implemented the approach described in this study to analyze system performance on these datasets. For the classification method used in this study, we proposed KNN and RF models to evaluate the suitability of the methods we used on the REFUGE and DrishtiGS-1 datasets and demonstrated that both models could be used to identify glaucoma through the use of fundus images. When the datasets were merged, we obtained 81.86% and 75.86% of accuracy when using blood vessel and optical cup segmentation results, respectively.

Keywords: glaucoma, invariant moment, knn, random forest, machine learning