Abstract

Glaucoma is a disease in which the intraocular pressure is very high, causing the optic disc to become cupped with eventual everlasting impairment of vision. It is the second leading cause of permanent blindness. It cannot be cured, but its progression can be slowed down by treatment in early stage. Therefore, detecting glaucoma in time is crucial. In this paper glaucoma is classified by extracting two features using retinal fundus images. (i) Cup to Disc Ratio (CDR). (ii) Ratio of Neuroretinal Rim in inferior, superior, temporal and nasal quadrants that is to say ISNT quadrants. Glaucoma frequently damages superior and inferior fibers before temporal and nasal optic nerve fibers and which start decreasing the superior and inferior rims areas and change the order of ISNT rule. Hence, the detection of rim areas in four directions can assist the correct verification of ISNT rule and then improve the correct diagnosis of glaucoma at early stages. In the end, feed forward back propagation neural network is used for classification based on the above two features. The tool used to accomplish the objective is MATLAB R2013a. The average accuracy of the system is around 96%. The method does not rely on trained glaucoma specialists or specialized and costly OCT/HRT machines. Several fundus retinal images containing normal and glaucoma were applied to the proposed method for demonstration.
ANN Glaucoma Detection using Cup-to-Disk Ratio and Neuroretinal Rim

References

- Aquino, Arturo, Manuel Emilio Gegúndez-Arias, and Diego Marín. "Detecting the


- High Resolution Fundus Image database https://www5.cs.fau.de/research/data/fundus-images/


Index Terms

Computer Science                        Artificial Intelligence

Keywords

Glaucoma  Fundus Image  Cup to Disk Ratio  Neuroretinal Rim  ISNT rule
Artificial Neural Network.