Glaucoma Detection in Retinal Image using Medial Axis Detection and Level Set Method

Abstract

Glaucoma is an eye disorder that characterized by elevated Intraocular pressure (IOP). The optic nerve head was damaged by the increased intraocular pressure. It will lead to vision loss, if it is unnoticed. By the extraction of optic disc and optic cup and also calculating the cup to disc ratio, the glaucoma will be detected. In our project we automatically extracted the optic disc in retinal image by using LDA and Medial axis detection. The optic cup extracted by using threshold based initialization level set method and ellipse fitting algorithm. These methods have been tested on drive databases. The average value obtained for (optic disc is a precision value and Recall value are 0.9 and 0.966 respectively, the F-score of 0.9323 and for optic cup a precision value and Recall value are 0.9 and 0.946 respectively, the F-score of 0.9218) describes that this method is a robust tool for detection of optic disc and optic cup.

References

- Sandra Morales*, Valery Naranjo, Jesús Angulo, and Mariano Alcañiz, Automatic
- Arturo Aquino, "Detecting the Optic Disc Boundary in Digital Fundus Images Using Morphological, Edge Detection, and Feature Extraction Techniques", Manuel Emilio Gegúndez-Arias, and Diego Marín
- Diego Marín, "A New Supervised Method for Blood Vessel Segmentation in Retinal Images by Using Gray-Level and Moment Invariants-Based Features", Arturo Aquino*, Manuel Emilio Gegúndez-Arias, and José Manuel Bravo
- Gopal Datt Joshi, Member, IEEE, Jayanthi Sivaswamy, Member, IEEE, and S. R. Krishnadass, Optic Disk and Cup Segmentation from Monocular Colour Retinal Images for Glaucoma Assessment.
- Juan Xua, "Optic disk feature extraction via modified deformable model technique for glaucoma analysis", Opas Chutatapeb, Eric Sungc, Ce Zhengd, Paul Chew Tec Kuan.
- Marc Lalonde, "Fast and Robust Optic Disc Detection Using Pyramidal Decomposition and Hausdorff-Based Template Matching", Mario Beaulieu, and Langis Gagnon*
Glaucoma Detection in Retinal Image using Medial Axis Detection and Level Set Method

- Toru Tamaki, Bingzhi Yuan, Kengo Harada, Bisser Raytchev, Kazufumi Kaneda Hiroshima University, Japan Linear Discriminative Image Processing Operator Analysis.

Index Terms

Computer Science

Image Processing

Keywords

Optic disc  LDA  Cup  boundary detection  Vessel bend  Level set method  cup-to-disc ratio