

عنوان مقاله:

.Automatic Segmentation of Choroidal Layer on OCT Images Based on Graph Theory and Curvelet Transform

محل انتشار:

بیست و نهمین کنگره سالیانه انجمن چشم پزشکی ایران (سال: 1398)

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خلاصه مقاله:

Purpose: The thickness measurement and the segmentation of choroid could guide ophthalmologists in order to diagnose most of the pathologies of the eye like diabetic retinopathy (DR). Manually measurement of the choroidal thickness from optical coherence tomography (OCT) images is time-consuming, tiresome and dependent on human errors. To overcome these difficulties in this paper we have introduced new computer aided diagnosis based method for automatic quantification of choroidal thickness. **Methods:** In this paper we used curvelet transform, KSVD dictionary learning and Lucy-Richardson algorithm in order to speckle noise removal and enhancement of the OCT images. Then, the graph theory is used to determine the location of the inner choroidal boundary (ICB). In order to find the outer choroidal boundary (OCB), we defined the image histogram in a specific range depend on the average brightness of the image. The area between ICB and OCB considered as choroidal thickness. **Results:** Our proposed method was evaluated on 60 EDI-OCT (Enhanced Depth Imaging Optical Coherence Tomography) images and by comparing the automatic segmentations with manual segmentations of ophthalmologists the average Dice's Coefficient was 92.14%. The Dice's coefficient is one of the statistical metrics for comparing the similarity of two samples which was presented by Thorvald Sørensen and Lee Raymond Dice in 1948 and 1945 respectively. It shows notable superiority of our proposed method over other methods. **Conclusion:** In both normal eyes and eyes with diabetic retinopathy, we observed a great agreement between the manual segmentations and our automatic segmentations. Also the choroid was thinner in eyes with diabetic retinopathy. Automatic segmentation of choroidal layer could also be useful for large-scale quantitative studies of the choroid.

کلمات کلیدی:

