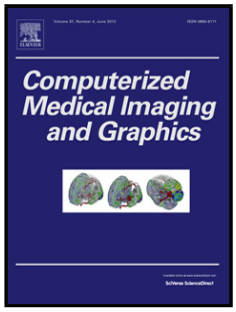

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An Automated Method for Choroidal Thickness Measurement from Enhanced Depth Imaging Optical Coherence Tomography Images

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Abstract

The choroid is vascular tissue located underneath the retina and supplies oxygen to the outer retina; any damage to this tissue can be a precursor to retinal diseases. This paper presents an automated method of choroidal segmentation from enhanced depth imaging optical coherence tomography (EDI-OCT) images. The Dijkstra shortest path algorithm is used to segment the choroid-sclera interface (CSI), the outermost border of the choroid. A novel intensity-normalisation technique that is based on the depth of the choroid is used to equalise the intensity of all non-vessel pixels in the choroid region. The outer boundary of choroidal vessel and CSI are determined approximately and incorporated to the edge weight of the CSI segmentation to choose optimal edge weights. This method is tested on 190 B-scans of 10 subjects against choroid thickness (CTh) results produced manually by two graders. For comparison, results obtained by two state-of-the-art automated methods and our proposed method are compared against the manual grading, and our proposed method performed the best. The mean root-mean-square error (RMSE) for finding the CSI boundary by our method is 7.71 ± 6.29 pixels, which is significantly lower than the RMSE for the two other state-of-the-art methods (36.17 ± 11.97 pix-

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