

عنوان مقاله:

Unsupervised Segmentation of Retinal Blood Vessels Using the Human Visual System Line Detection Model

محل انتشار:

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خلاصه مقاله:

Retinal image assessment has been employed by the medical community for diagnosing vascular and non-vascular pathology. Computer based analysis of blood vessels in retinal images will help ophthalmologists monitor larger populations for vessel abnormalities. Automatic segmentation of blood vessels from retinal images is the initial step of the computer based assessment for blood vessel anomalies. In this paper, a fast unsupervised method for automatic detection of blood vessels in retinal images is presented. In order to eliminate optic disc and background noise in the fundus images, a simple preprocessing technique is introduced. First, a newly devised method, based on a simple cell model of the human visual system (HVS) enhances the blood vessels in various directions. Then, an activity function is presented on simple cell responses. Next, an adaptive threshold is used as an unsupervised classifier and classifies each pixel as a vessel pixel or a non-vessel pixel to obtain a vessel binary image. Lastly, morphological post-processing is applied to eliminate exudates which are detected as blood vessels. The method was tested on two publicly available databases, DRIVE and STARE, which are frequently used for this purpose. The results demonstrate that the performance of the proposed algorithm is comparable with state-of-the-art techniques.

کلمات کلیدی:

Retinal Vessel Segmentation; Simple cell Model; DRIVE Database; STARE Database

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