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Authors:

Rajat Suvra Nandy, Rohit Kamal Chatterjee, Avijit Kar

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Abstract

In this paper a new algorithm is proposed for segmentation of the retinal blood vessels in the ophthalmoscopic images using Mathematical Morphology based technique named as Adaptive Line Structuring Element (ALSE). The ALSE is rotated to adjust with the curvature of the blood vessels which ensure that each part of the vessel components remains connected and followed by changing the size of the line structuring element that adaptively discards non-vessel like objects in a fundus image. This forms a Scale-Space that extracts the blood vessels structure in retina successfully from finer scales to coarser scale without much loss of data. For the purpose of evaluating performance of proposed algorithm two well-known criterion function namely Structural Similarity (SSIM) index and Figure of Merit (FOM) index are used for comparing the results. The average value of SSIM and FOM indicates better performance of the proposed algorithm than other recent methods.

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Keywords

Adaptive Mathematical Morphology, Adaptive Line Structuring Element, Retinal Images, Curvature Scale-Space.