

A Generic Lesion Detector for Retinal Images^{*}

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Abstract

Certain diseases (e.g. diabetic retinopathy, age-related macula degeneration etc.) can be recognized by the analysis of retinal images. Early screening is crucial as malconditions may have serious consequences, in extreme cases they may even cause blindness. The literature on the automatic recognition of disorders based on digital image processing is extensive, but the solutions suggested in most papers suffer from the inefficient use of computational resources. Efforts have been made to filter out ineligible images, which can be improved further by scanning only those regions that are likely to contain lesions.

In this paper, we present an approach to the detection of retinal image regions which probably contain lesions. These regions can serve as input to the actual lesion detectors, which in turn perform more efficiently due to the fact that a smaller area needs to be scanned compared to the entire image. Lesions include microneurysms, haemorrhages, exudates and retinal pigment epithelium.

The prior detection of regions is at the same time a prefiltering step, because images that do not possibly contain lesions are excluded from further processing. Our empirical results suggest that this approach can be integrated into screening systems for diabetic retinopathy.

Keywords: retinal image, automatic screening, lesion candidate, image processing

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