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A Decision Support Framework for Automated Screening of Diabetic Retinopathy

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Abstract

The early signs of diabetic retinopathy (DR) are depicted by microaneurysms among other signs. A prompt diagnosis when the disease is at the early stage can help prevent irreversible damages to the diabetic eye. In this paper, we propose a decision support system (DSS) for automated screening of early signs of diabetic retinopathy. Classification schemes for deducing the presence or absence of DR are developed and tested. The detection rule is based on binary-hypothesis testing problem which simplifies the problem to yes/no decisions. An analysis of the performance of the Bayes optimality criteria applied to DR is also presented. The proposed DSS is evaluated on the real-world data. The results suggest that by biasing the classifier towards DR detection, it is possible to make the classifier achieve good sensitivity.