Macular edema classification using self-organizing map and generalized learning vector quantization

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Abstrak

Macular edema is a kind of human sight disease as a result of advanced stage of diabetic retinopathy. It affects the central vision of patients and in severe cases lead to blindness. However, it is still difficult to diagnose the grade of macular edema quickly and accurately even by the medical doctor's skill. This paper proposes a new method to classify fundus images of diabetics by combining Self-Organizing Maps (SOM) and Generalized Vector Quantization (GLVQ) that will produce optimal weight in grading macular edema disease class. The proposed method consists of two learning phases. In the first phase, SOM is used to obtain the optimal weight based on dataset and random weight input. The second phase, GLVQ is used as main method to train data based on optimal weight gained from SOM. Final weights from GLVQ are used in fundus image classification. Experimental result shows that the proposed method is good for classification, with accuracy, sensitivity, and specificity at 80%, 100%, and 60%, respectively.