

ABSTRACT

CLASSIFICATION OF DIABETIC RETINOPATHY DISEASE IN BLOOD VESSEL SEGMENTATION IN FUNDUS IMAGES USING AUTOMATIC POLLING SEEDED REGION GROWING (APSRG) WITH THE LEARNING VECTOR QUANTIZATION (LVQ) METHOD

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This research aims to develop a blood vessel classification system in fundus images through the integration of Automatic Polling Seeded Region Growing (APSRG) method for segmentation and Learning Vector Quantization (LVQ) for classification. The segmentation performance evaluation using the DRIVE dataset showed promising results with 91.19% accuracy, 86.45% recall, but relatively low precision (45.70%) and 59.79% F1-Score. In the classification aspect, the LVQ model was evaluated using a 5-fold cross-validation technique, resulting in an average accuracy of 0.4900 with a standard deviation of 0.2354. Evaluation on the validation set achieved an accuracy of 0.5000 and the test set 0.6000, but showed an imbalance in performance between classes with better performance in class 1 than class 2. The results indicate the need for further optimization, especially in reducing false positives in the segmentation process and improving classification capabilities for class 2. This research provides a foundation for the development of more accurate and efficient blood vessel classification systems in the future.

Keywords: *APSRG, blood vessel segmentation, classification, fundus image, LVQ.*