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Paper Title: MobileNetV2-based Deep Learning for Retinal Disease Classification on a Mobile Application

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Abstract

(1) Background: Cataract, glaucoma, and diabetic retinopathy are prevalent retinal diseases that can have significant adverse effects on vision and eye health. Cataracts result in the clouding of the lens, leading to blurred vision and reduced visual acuity. Glaucoma damages the optic nerve, causing peripheral vision loss and the potential for blindness. Diabetic retinopathy, which arises as a complication of diabetes, impacts the blood vessels in the retina and can result in vision impairment and blindness. Timely detection, appropriate treatment, and regular monitoring play a crucial role in effectively managing these conditions and minimizing their impact on vision. (2) Methods: Using the MobileNetV2 deep learning network, an automated classification technique for retinal disease detection from optical coherence tomography (OCT) images was created. The OCT scans, with a sample size of 224×224 pixels, are divided into four classes- cataract (CAT), glaucoma (GLC), diabetic retinopathy (DR), and normal retina. Using MobileNetV2 makes it simple to export models into Android mobile apps for point-of-care diagnosis. Using validation samples, the model was adjusted, and its accuracy and sensitivity were assessed. Evaluation metrics such as accuracy, precision, recall, and F1-score were used to assess the performance of the model. (3) Results: According to the experimental findings on an extensive dataset, the proposed MobileNet V2 can deliver an accuracy of 0.9983 for training and 0.9952 for validating. The precision, recall, and F1-score values were also obtained and demonstrated strong performance in the classification of retinal diseases.
