Enhanced Ophthalmic Diagnostics with RetinaNetX Leveraging Combined Image Processing Techniques for Diabetic Retinopathy

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Abstract:
The burgeoning field of medical image analysis has witnessed significant advancements with the advent of deep learning. Our study presents RetinaNetX, an innovative convolution neural network framework that integrates Prewitt Edge Detection with EfficientNetB4 for enhanced detection of diabetic retinopathy in fundus images. This approach capitalizes on the strength of edge detection algorithms to highlight critical features in retinal images, which are then processed through a deep learning model tailored for highaccuracy classification. We evaluated RetinaNetX using a comprehensive dataset, and the results demonstrated marked improvements in diagnostic accuracy. This novel method paves the way for more reliable and efficient ophthalmic diagnostics, offering a significant leap over traditional image processing techniques.

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