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(57) Abstract :
This paper introduces a pioneering approach utilizing deep learning algorithms for the segmentation of retinal blood vessels in fundus images, aiming to advance disease diagnosis in ophthalmology. By integrating cutting-edge neural network architectures, the proposed method effectively harnesses shape and size information, optimizing the utilization of available samples and surpassing conventional segmentation techniques. Through extensive experimentation, our approach demonstrates superior accuracy in detecting retinal abnormalities compared to assessments by skilled ophthalmologists. Moreover, our model showcases robustness in handling variations in image quality and pathological manifestations, exhibiting potential for real-world clinical applications. The integration of deep learning not only enhances segmentation accuracy but also enables automated analysis, thereby reducing the burden on healthcare professionals and facilitating timely intervention. This research contributes to the ongoing efforts in leveraging artificial intelligence for improving diagnostic accuracy and efficiency in ophthalmology, ultimately enhancing patient outcomes and the quality of care in retinal disease management.

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