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Advances in Processing Retinal Images.

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INTRODUCTION

In the modern day, visual impairment is regarded as the main worldwide challenge. This is caused by a variety of factors, including a lack of knowledge, a lack of resources and qualified staff, the inability to seek emergency medical attention, etc. The primary methods for Examining the retina non-invasively involves techniques like optical coherence tomography (OCT) and fundus photography. Fluorescein angiography is another widely used method.

To aid in a more thorough diagnosis, these photos are analyzed by professionals. However, it is not possible to manually analyze these data due to the volume of clinical observations required on a daily basis.

For this reason, automated retinal image analysis has emerged as a necessary processing method in contemporary retinal analysis. The computerized analysis can help with disease diagnosis, patient grading, and tracking the disorder's advancement or reversal. Age-related macular degeneration, diabetic macular edema, glaucoma, andOne of the common retinal illnesses that progresses and necessitates frequent follow-ups is retinopathy. Modern gadgets like smartphone camera attachments, portable OCTs, and others have made it easier to obtain retinal scans. Nevertheless, there is a pressing need to create automated retinal imaging applications because to the growing number of blind people and the accessibility of enormous computer resources.

The range of cutting-edge technologies, including deep learning and artificial intelligence, could lead to There were multiple entries for this special issue. Every paper that was submitted went through a thorough peer review procedure. Five articles were chosen after extensive changes in accordance with the expert's judgment.

A cascaded two-stage network for intraretinal layer segmentation is proposed and validated by the authors of the publication "Intraretinal Layer Segmentation Using Cascaded Compressed U-Nets" [1]. Both networks are compressed versions of U-Net (CCU-INSEG).In this model, the segmentation of retinal tissue from OCT B-scans is done by the first network. Additionally, the second network segments eight high-fidelity intraretinal layers. A variety of datasets are used to test and validate the model.

The authors of the study "Unsupervised Approaches for the Segmentation of Dry ARMD Lesions in Eye Fundus cSLO Images" [2] suggest an effective technique for ARMD segmentation that involves modifying a fully convolutional network, known as W-net.lesions. A sizable dataset is used to test the model, and the outcomes look good.

The authors create a two-phase model for glaucoma identification in the work "EffUnet-SpaGen: An Efficient and Spatial Generative Approach to Glaucoma Detection" [3], recognizing and taking advantage of a redundancy in fundus imaging data pertaining specifically to the dimensions. An extended spatial generative approach is combined with a unique algorithm for segmenting cups and discs that uses an efficient convolution block for geometry modeling and classification. A different dataset is used to test the method and show how well the model performs.

The authors of the study "Towards a Connected Mobile Cataract Screening System: A Future Approach" [4] examine the advancements and drawbacks of existing techniques for cataract diagnosis and grading that make use of several imaging modalities. Ultimately, they come to an end. that ophthalmologists may find it useful and practicable to employ smartphone photos as the cataract screening tools of the future, particularly in remote places with few medical resources.

Lastly, the review paper "Automated Detection and Diagnosis of Diabetic Retinopathy: A Comprehensive Survey" [5] discusses the literature that has been published in the open literature during the last six years (2016–2021) that deals with AI approaches to DR, such as ML and DL in classification and segmentation. Furthermore, an extensive DR datasets that are currently available are included.

Conflicts of Interest : None that the writers are aware of exist.

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