DEEP LEARNING FUNDUS IMAGE ANALYSIS FOR EARLY DETECTION OF DIABETIC RETINOPATHY

SUBMITTED BY

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LITERATURE SURVEY:

S.NO	AUTHORS	TITLE	ABSTRACT
1.	N. Memari, S. Abdollahi, M. M. Ganzagh and M. Moghbel	Computer-assisted diagnosis (CAD) system for Diabetic Retinopathy screening using colour fundus images using Deep learning	The proposed computer-assisted diagnosis system starts with the segmentation of the blood vessels. Then, microaneurysms and exudates are segmentation from the image. Statistical and regional features are then extracted utilising first, second, and higher-order image features. A Deep Learning framework will be utilised for extracting additional statistical image descriptors as Deep Learning has superior contextual analysis capabilities compared to other machine learning techniques.
2.	A. Bali and V. Mansotra	Deep Learning-based Techniques for the Automatic Classification of Fundus Images: A Comparative Study	In this paper different deep learning (DL) techniques for automatic classification of fundus images have been discussed and results are compared on the basis of accuracy, f1-score and AUC.
3.	M. Z. Atwany, A. H. Sahyoun and M. Yaqub	Deep Learning Techniques for Diabetic Retinopathy Classification: A Survey	This paper reviews and analyses state-of-the-art deep learning methods in supervised, self-supervised, and Vision Transformer setups, proposing retinal fundus image classification and detection. The paper discusses the available retinal fundus datasets for Diabetic Retinopathy that are used for tasks

			such as detection, classification, and segmentation. The paper also assesses research gaps in the area of DR detention/classification and addresses various challenges that need further study and investigation.
4.	S. Gupta, A. Panwar, A. Kapruwan, N. Chaube and M. Chauhan	Real Time Analysis of Diabetic Retinopathy Lesions by Employing Deep Learning and Machine Learning Algorithms using Colour Fundus Data	The colour fundus dataset scans after processing are passed to multiple Deep Learning (DL) models employed to learn characteristics. These models trained on millions of different images from thousands of classes. Finally, several machine learning classifiers were used to classify lesions using the collected characteristics. The extracted result shows very eye-catching performance. This enables experts to create architecture that fully addresses the problem of classifying unidentified scans into the right class or category.
5.	H. Kaushik, D. Singh, M. Kaur, H. Alshazly, A. Zaguia and H. Hamam.	Diabetic Retinopathy Diagnosis from Fundus Images Using Stacked Generalisation of Deep Models	In this research, a methodology to eliminate these unnecessary reflectance properties of the images using a novel image processing schema and a stacked deep learning technique for the diagnosis. For the luminosity normalisation of the image, the grey world odour constancy algorithm is implemented which does

			image desaturation and improves the overall image quality.
6.	B. Bulut, V. Kalin, B. B. Güneş and R. Khazin	Deep Learning Approach for Detection of Retinal Abnormalities Based on Colour Fundus Images	This research uses the Xception model with transfer learning method to classify image obtained from Akdeniz University Hospital Eye Diseases Department. During the analysis, the Xception model containing 50 different parameter combinations was trained by scanning the appropriate hyper-parameter space for the model.
7.	B. Gowtham, M.F. Hashmi, Z. W. Geem and N. D. Bokde	A Comprehensive Review of Deep Learning Strategies in Retinal Disease Diagnosis Using Fundus Images	This article presents a comprehensive study of different deep learning strategies employed in recent times for the diagnosis of five major eye diseases, i.e., Diabetic retinopathy, Glaucoma, age-related macular degeneration, Cataract, and Retinopathy of prematurity.
8.	T. A. Soomro *et al*	Deep Learning Models for Retinal Blood Vessels Segmentation: A Review	This paper presents a comprehensive review of the principle and application of deep learning in retinal image analysis. This paper characterises each deep learning-based segmentation method as described. Analysing along with the limitations and advantages of each method. In the end, we offer some recommendations for future improvement for retinal image analysis.

09.	W. Zhang, X. Zhoo, Y. Chen, J. Zhong and Z. Yi	Deep UWF: An Automated Ultra-Wide-Field Fundus Screening System via Deep Learning	The emerging ultra-wide-field of view (UWF) fundus colour imaging is a powerful tool for fundus screening. However, manual screening is labour-intensive and subjective. Based on 2644 UWF images, a set of early fundus abnormal screening systems named DeepUWF is developed. The experimental results show that these preprocessing methods are helpful to improve the learning ability of the networks and achieve good sensitivity and specificity. Without ophthalmologists, DeepUWF has potential application value, which is helpful for fundus health screening and workflow improvement.
10.	H. Yeh, C. -J. Lin, C. -C. Hsu and C. -Y. Lee	Deep-learning based Automated Segmentation of Diabetic Retinopathy Symptoms	Deep learning is used in many types of preprocessing for segmentation. We preprocessed fundus images and inputted them into the model for training. Finally, LDF image was used to obtain the best preprocessing method for optic disc segmentation in fundus images.

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9. W. Zhang, X. Zhao, Y. Chen, J. Zhong and Z. Yi, "DeepUWF: An Automated Ultra-Wide-Field Fundus Screening System via Deep Learning," in IEEE Journal of Biomedical and Health Informatics, vol. 25, no. 8, pp. 2988-2996, Aug. 2021, doi: 10.1109/JBHI.2020.3046771.
10. A. Bali and V. Mansotra, "Deep Learning-based Techniques for the Automatic Classification of Fundus Images: A Comparative Study," 2021 3rd International Conference on Advances in Computing, Communication Control and Networking (ICAC3N), 2021, pp. 351-359, doi:10.1109/ICAC3N53548.2021.9725464.