

DEEP LEARNING FUNDUS IMAGE ANALYSIS FOR EARLY DETECTION OF DIABETIC RETINOPATHY

LITERATURE SURVEY

Fulong Ren^{1 2}, Peng Cao^{1 2}, Dazhe Zhao^{1 2}, Chao Wan³ macula localization, exudate candidate identification with vector quantization and exudate candidate classification with semi-supervised learning. The proposed method and the state-of-the-art approaches are compared in terms of performance, and experimental results show the proposed system overcomes the challenge of the DME grading and demonstrate a promising effectiveness.

Kangrok Oh, Hae Min Kang, Dawoon Leem, Hyungyu Lee, Kyoung Yul Seo & Sangchul Yoon. They measure image-wise RSD values using the test model outputs from the ten runs of cross-validation tests. Consequently, average RSD values for both DR detection systems based on ETDRS 7SF and F1-F2 images are reported

Silva et al. demonstrated that peripheral lesions identified on UWF imaging are associated with the increased risk of DR progression³⁷. Those pioneering studies^{33,34,35,36,37} regarding the UWF imaging for DR severity evaluation utilized capturing devices from Optos. The wide-field scanning laser ophthalmoscopy (SLO) by Optos provides a single image covering nearly 200° of the retina¹⁸. During transforming the wide-field image of the spherical eye into the 2-D image, small lesions may be inconspicuous due to distortion¹⁸. Furthermore, eyelashes and eyelids cover the superior and inferior periphery of the retina in some cases³². Aiello et al.³³ demonstrated that the ETDRS 7SF photography and corresponding fields in the UWF photography have moderate to substantial agreements for DR severity evaluation.

Poornima S V, Parvatha Lakshmi B, Nishchala T K, Umamakeswari A automated the detection of diabetic retinopathy, thereby eliminating errors culminated by human measurement. Fundus images obtained from HRF database [2] have been used for this study.

Early Detection of Diabetic Retinopathy by Using Deep Learning Neural Network Mohamad Hazim Johari¹, Hasliza Abu Hassan², Ahmad Ihsan Mohd Yassin^{1*}, Nooritawati Md Tahir¹, Azlee Zabidi¹, Zairi Ismael Rizman³, Rahimi Baharom¹, Norfishah Abdul Wahab¹ he data set used were retrieved from MESSIDOR database and it contains 1200 pieces of fundus images. The images were filtered based on the project needed. There were 580 pieces of images types .tif has been used after filtered and those pictures were divided into 2, which is Exudates images and Normal images. On the training and testing session, the 580 mixed of exudates and normal fundus images were divided into 2 sets which is train-ing set and testing set. The result of the training and testing set were merged into a confusion matrix. The result for this project shows that the accuracy of the CNN for training and testing set was 99.3% and 88.3% respectively

Deep Learning Fundus Image Analysis for Diabetic Retinopathy and Macular Edema Grading Jaakko Sahlsten¹, Joel Jaskari¹, Jyri Kivinen¹, Lauri Turunen², Esa Jaanio², Kustaa Hietala³ & Kimmo Kaski^{1,*} they first present the details of smartphone-based portable retinal imaging systems available on the market to compare their features and image qualities. Second, they introduce the Field of View (FoV) determination process of each smartphone-based retinal imaging system using a circular test pattern. Third, they introduce the layout of the adopted deep learning architecture for DR detection

Diabetic Retinopathy Detection Using Prognosis of Microaneurysm and Early Diagnosis System for Non-Proliferative Diabetic Retinopathy Based on Deep Learning Algorithms LIFENG QIAO ¹, YING ZHU ², AND HUI ZHOU ². To propose the Prognosis of Microaneurysm and early diagnosis system for non - proliferative diabetic retinopathy (PMNPDR) utilizing a deep convolutional neural network for semantic segmentation of fundus images which can increase the efficiency and accuracy of NPDR.

- Maximum matching filter response (MFR) mutual infor-mation (MI) and maximum Gaussian answer laplacian (LoG) in the 2-dimension function space utilizing Differential Evolution which, has not been previously explored in the detection of lesions.
- The experimental results have been performed based on the datasets (<https://ieee-dataport.org>) [25].