

Automated Detection of Diabetic Retinopathy for Early Diagnosis using Exudate Images

P. Manimegalai, S. Soundarya, J. R. Aswath, M. Sowmiya, N. Raja Lakshmi

Abstract: Retina plays a vital character in detection of various diseases in early point such as diabetes retinopathy which can be performed by analyzing the retinal images [6]. Diseased patients have to undergo periodic screening of eye. Standouts amongst the most predominant clinical indications of diabetic retinopathy are exudates [17]. To detect diabetic retinopathy in patients the ophthalmologist inspects the exudates by Ophthalmoscopy [17] where recognition of exudates is a vital diagnostic undertaking in which computer help may assume a noteworthy job. But intrinsic characteristics of retinal images detection process is difficult for the ophthalmologists. Here, we proposed another algorithm "Superpixel Multi-Feature Classification" for the programmed automatic recognition of retinal exudates successfully and to encourage ophthalmologist to give better patient finding experiencing diabetic retinopathy, advising them the level of seriousness ahead of time. The performance of algorithm has been compared as a result, the outcomes are effective and the sensitivity and specificity for our exudates identification is 80% and 91.28%, respectively [15].

Keywords: Super pixel, Diabetic Retinopathy, Exudates, Image Processing.

I. INTRODUCTION

Diabetic retinopathy is a basic eye disease which can be viewed as sign of diabetes on the retina. Diabetic retinopathy is described by the improvement of retinal micro aneurysms, hemorrhages and exudates. Exudates happen when lipid or fat leaks from abnormal vein or aneurysms. Exudates are described by bright spots with sharp edges [17]. There are two sorts of diabetic retinopathy they are NPDR (no proliferative diabetic retinopathy) and PDR (proliferative diabetic retinopathy) where NPDR can be subdivided into mild NPDR, moderate NPDR, severe NPDR. Proliferative anyway alludes whether there is any neovascularization (strange vein development) present or not. This paper proposes another computer put together conclusion based with respect to the computerized picture preparing of exudate pictures so as to help individuals recognizing diabetic retinopathy ahead of time. The primary objective is to naturally group the non-proliferative diabetic retinopathy evaluation of any retinal picture. Our proposal has been tried on a database of 400 retinal pictures named by a 4-grade size of non-proliferative diabetic retinopathy.

Accordingly, we acquired a most extreme sensitivity of 80% and a prescient limit estimation of 91.28%. Robustness regarding changes in the parameters of the calculation has additionally been assessed. Amid the early long periods of research, image processing techniques, for example, thresholding, separating and morphological administrators were utilized. Recent research is focused on implementing segmentation, edge detection, mathematical modeling, classification, pattern recognition and texture analysis techniques.

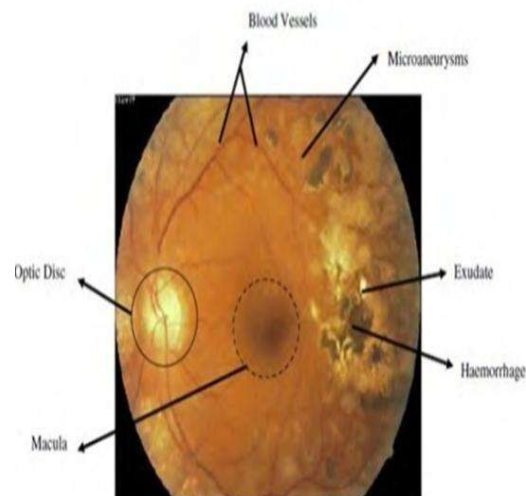


Fig1: Features in DR image

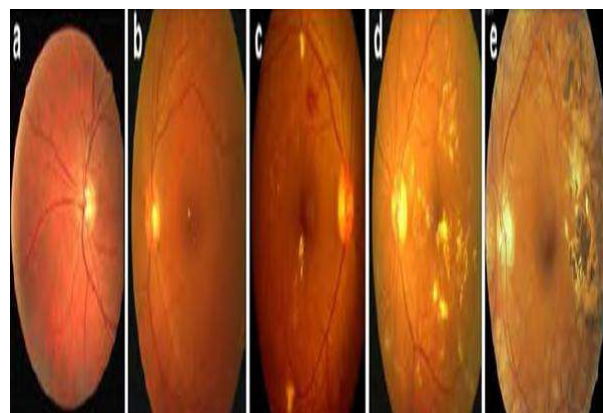


Fig 2: (a) Normal (b) Mild DR (c) Moderate DR (d) Severe DR (e) PDR

Revised Manuscript Received on 14 August, 2019.

P. Manimegalai, Assoc.Professor, Instrumentation EnggDepartment,Karunya Institute of Tech and Sciences, Coimbatore, Tamilnadu, India.(Email: manimegalai@karunya.edu)

S. Soundarya, UG scholar/ECE,Department of ECEKAHE, Coimbatore, Tamilnadu, India.(Email: soundaryasakthi2@gmail.com)

J.R. Aswath, UG scholar/ECE,Department of ECEKAHE, Coimbatore, Tamilnadu, India.(Email: jraswath98@gmail.com)

M.Sowmiya, UG scholar/ECE,Department of ECEKAHE, Coimbatore, Tamilnadu, India.(Email: sowmiyamylsamy@gmail.com)

N. Raja Lakshmi, Associate Professor,Department of BiomedicalEngineering, KAHE, Coimbatore,Tamilnadu, India.(Email: praniraj1@gmail.com)