

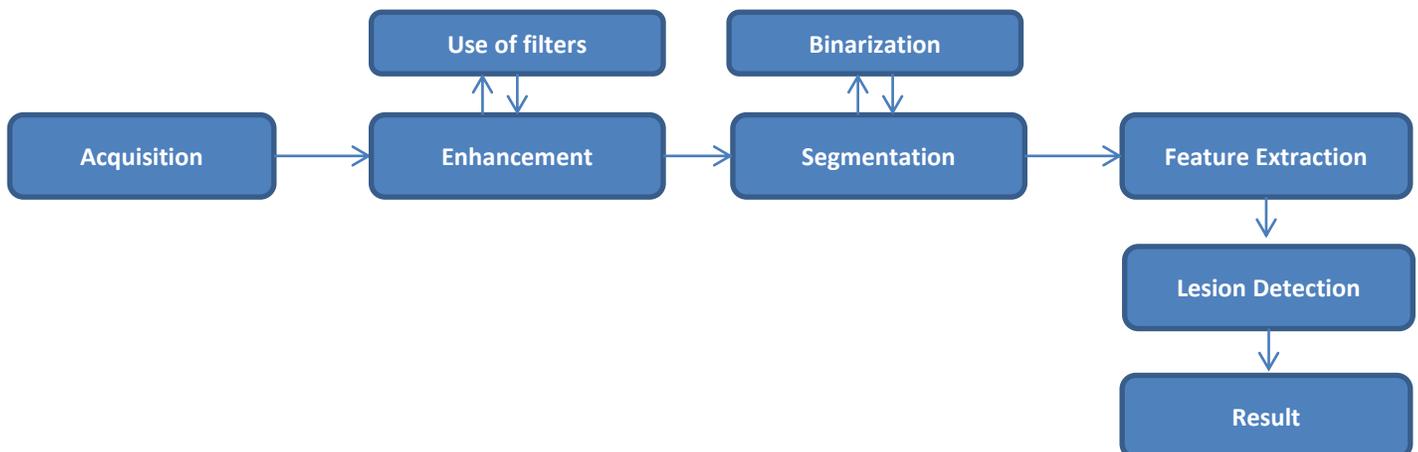
## Concept Note on Diabetic Retinopathy without using Angiography

Diabetic retinopathy is the most common diabetic eye disease seen in every nine out of ten diabetic patients across the world. It generally occurs when blood vessels in the retina changes abnormally. In most of the reported cases these vessels get swelled and there is fluid leakage or even close off completely. In other cases, the abnormal growth of new blood vessels has been seen on the surface of the retina. According to survey conducted by times of India, India is the world's diabetes capital and Diabetic retinopathy (blindness caused by diabetes) is one of the sixth causes of blindness in the country. Earlier it was the 17th cause of blindness in the country 20 years ago it has become the sixth cause with 18% of diabetic's patient above age of 40 years having diabetic retinopathy. According to WHO 347 million people worldwide have diabetes. WHO projects that, diabetes deaths will increase by two thirds between 2008 and 2030. Diabetic retinopathy is an important cause of blindness. Therefore there is great need for early detection of diabetic retinopathy which helps many people from losing their sight.

Over the time, diabetes can damage the heart, blood vessels, eyes, kidneys, and nerves. The Patient with Diabetic has to undergo regular check-up and screening to ensure the functioning of organs those are often damaged due to diabetics. While screening of eyes of diabetic patient if lesions are not visible through fundus image, normally doctor recommends angiography to the patient. However Angiography is not advisable in certain conditions like old age, pregnancy, patient having blood pressure, other serious health problems and patient has went under some major surgery in recent time etc.

This motivates to design an image processing system which will take a color fundus image where diabetic lesions are not visible as an input and process it in such a way that lesions will be visible to doctor for further analysis of fundus image. This output or result is found equivalent to the results of vetrio-retinal surgeon obtained after the angiography of patient.

The schematic view of the designed process is as shown in figure 1



Sample results Obtained through the process defined as per figure 1. The fundus images were collected from Saswade Netralaya, Aurangabad

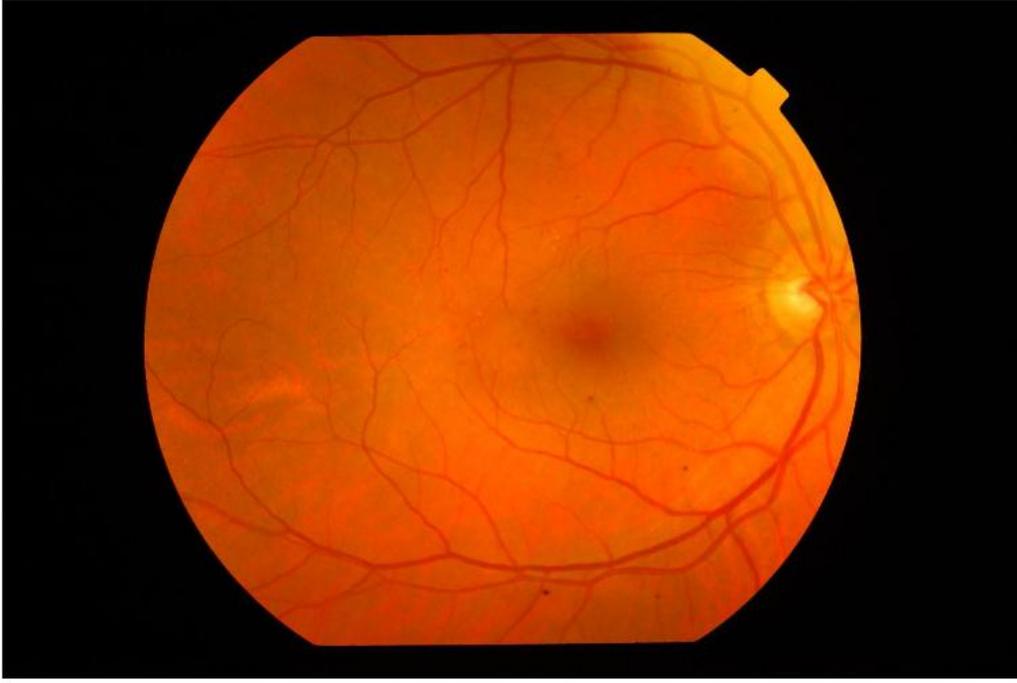


Fig.2 Fundus image of diabetic patient where lesions are invisible



Fig.3 Angiography image of Patient where lesions are visible.

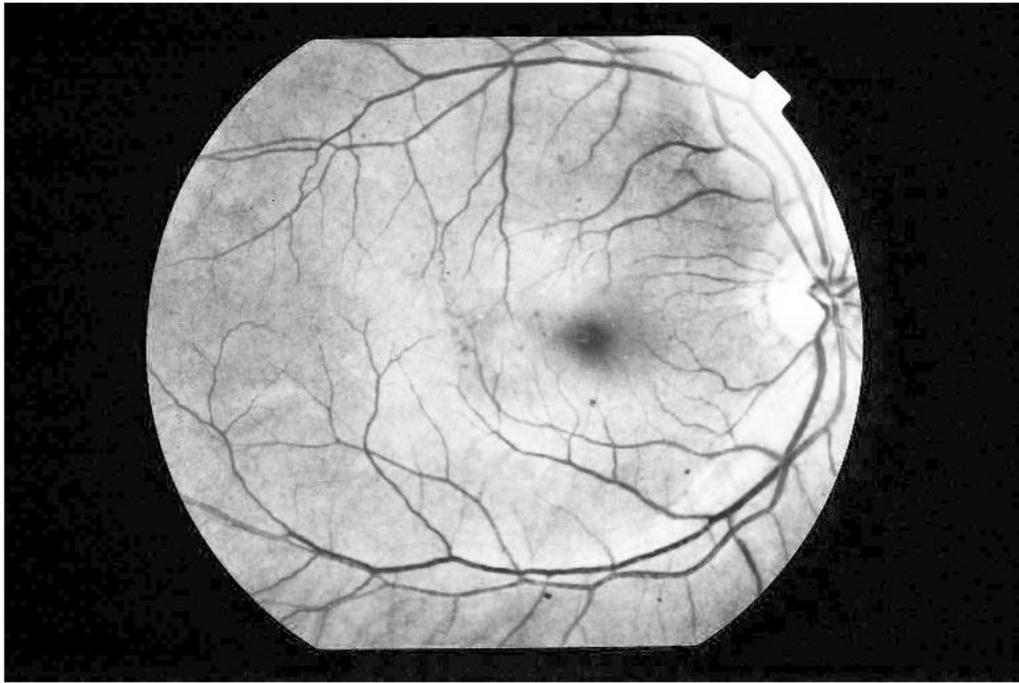


Figure 4. Image obtained through the proposed method as shown in figure 1, clearly indicating detected lesions

The proposed process is tested on image database constituted during this research and the results were published in reputed journals.

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