Literature Survey

- ## Early detection of diabetic retinopathy

  This paper attempts to describe all studies focused on the development of subclinical DR biomarkers and how they may be implemented for routine clinical use and to explore the possible perspectives for detection of subclinical DR.

- ## AI-Based Automatic Detection and Classification of Diabetic Retinopathy Using U-Net and Deep Learning

  Here they suggest a two-stage novel approach for automated DR classification in this research. Due to the low fraction of positive instances in the asymmetric Optic Disk (OD) and blood vessels (BV) detection system, preprocessing and data augmentation techniques are used to enhance the image quality and quantity. The first step uses two independent U-Net models for OD (optic disc) and BV (blood vessel) segmentation. In the second stage, the symmetric hybrid CNN-SVD model was created after preprocessing to extract and choose the most discriminant features following OD and BV extraction using Inception-V3 based on transfer learning, and detects DR by recognizing retinal biomarkers

- ## Referable diabetic retinopathy identification from eye fundus images with weighted path for convolutional neural network

  In this paper they propose a new strategy, which applies multiple weighted paths into convolutional neural networks, called the WP-CNN, motivated by ensemble learning. In WP-CNN, multiple path weight coefficients are optimised by back propagation, and the output features are averaged for redundancy reduction and fast convergence.

- ## A Novel Way to Detect Hard Exudates Using Dynamic Thresholding Technique in Digital Retinal Fundus Image

  Here they have applied median filtering onto the input image directly if it is in grayscale, otherwise we have to convert the input image into grayscale before applying median filtering. In the next step they have subtracted the median filtered image from the input image (grayscale) and have found that the optic disk is eliminated after the subtraction operation, which often has almost similar intensity as that of the hard exudates.Finally image addition is performed in between input image (grayscale) and thresholded image.

- ## Fundus image lesion detection algorithm for diabetic retinopathy screening

  This paper proposes a single framework for automatic lesion detection that can be used for quick screening-based disease diagnosis. It consists of four steps: luminosity and contrast enhancement, removal of extracted blood vessels and optic disc (OD), lesion detection and classification based on lesions.The proposed algorithm is analysed using the publically available datasets and evaluated using the metrics of specificity, sensitivity and accuracy.

- ## Low-complexity computer-aided diagnosis for diabetic retinopathy

  Convolutional neural networks (CNNs) have been developed for the analysis of fundus pictures and have proven to be more effective than other methods in tasks requiring detection and classification. The four stages of DR—normal retinas, NPDR, severe NPDR, and PDR—are detected and classified using colour fundus images in this chapter. This classification is done without the use of previous image processing or data augmentation techniques, giving ophthalmologists the tools they need to more accurately diagnose the condition and track its progression.

- ## An Approach to Detecting Diabetic Retinopathy Based on Integrated Shallow Convolutional Neural Network

  In this paper, performance integration and multi-scale shallow CNNs are used to classify retinal images in order to identify diabetic retinopathy early on. The experiments reveal that the performance integration model outperforms other integration models in terms of accuracy. When compared, the suggested approach to existing approaches, it also performs well on small datasets in terms of classification effect and efficiency.

- ## Survey on recent developments in automatic detection of diabetic retinopathy

  The primary purpose of this research study includes availability of publically available DR datasets, diabetic retinopathy detection methods (retinal feature extraction), diagnose the normal retinal and abnormal retinal features using recently proposed CAD systems, DR detection algorithms performance evaluation and future research in the field of DR. This survey study uses certain techniques to detect diabetic retinopathy and thoroughly evaluate performance. It does so within the framework of approximately 150 research articles and the collected retinal dataset.

- ## A survey on active learning and human-in-the-loop deep learning for medical image analysis

  This review explores the potential role of humans in the design and implementation of deep learning-enabled diagnostic applications, with an emphasis on methods that will preserve a considerable level of end-user involvement. Due to the fact that working in the medical field is safety-critical, we anticipate that research in the area of human-in-the-loop computing will become more and more significant, Practical considerations. Four key areas that are considered vital for deep learning in the clinical practice are active learning, interaction with model outputs, future prospective and unanswered questions.