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Paper-1: An Automated Detection and Multi-stage classification of Diabetic Retinopathy using Convolutional Neural Networks.

Summary: This paper presents an approach for Automated and Multi-stage classification of diabetic retinopathy using convolutional neural networks with successful implementation of the DenseNet-169 and DiaNet model. The dataset consists of retinal images from APTOS and EyePACS, that contains images of all stages of retinopathy for training and testing the model. By conjugating techniques such as pre-processing with the Gabor filter and data augmentation through PCA, the model achieves an outstanding accuracy of 90.02% in identifying diabetic retinopathy. However, the scope for improvement lies in exploring the ensembled algorithms to enhance the accuracy and efficiency of the model to detect the disease in early stages.

Paper-2: An Efficient way to analyze Diabetic Retinopathy Detection and Classification using Deep Learning Techniques.

Summary: This paper explores a new dimension in the sector of Diabetic Retinopathy which is the main cause of blindness in diabetes patients. It creates an opportunity to easily diagnose this disease using CNN and BNN. Previous papers of this topic were thoroughly surveyed. Among them, the best paper was selected and the dataset was taken from Kaggle organized by EyePACS. Some preprocessing methods were used to avoid losing features from the image. VGG16, SPP and NiN methods were proposed and the dataset was classified into five different stages. For designing purposes, CNN was employed with an input image layer of 1000x1000 pixel. Then Max-Pooling, Convolution and ReLU layer were used achieving an accuracy rate of 99% using Kaggle with CNN. In a nutshell, this paper provides an opportunity to every patient who has been suffering from this disease by diagnosing the images of micro vascular damages.

Paper-3: Detection and Classification of Diabetic Retinopathy using Pretrained Deep Neural Networks

Summary: This paper directs the vital issue of diabetic retinopathy, a condition that affects a vast amount of people with diabetes and can lead to blindness if not detected early. Avoiding the tradition methods, a deep learning base system, a pretrained convolutional neural network is utilized to classify retinal images into different level of DR. Two pre-trained model, VGG-16 and MobileNetV2 is used. The dataset was collected from the Asia-Pacific Tele Ophthalmology Society (APTOS), available on Kaggle. The images were labeled from 0 to 4 depending on the severity of the disease. The models reflect with a good accuracy rate of VGG-16 achieving 90% accuracy and MobileNetV2 achieving 92% accuracy in finding DR severity levels. Different training and validation curves were also demonstrated for loss in validation and accuracy in training and validation stages. As there is a 30% chance of developing DR of a person with diabetes, this computer vision base technologies has to be used to identify this disease to detect it in the primitive stages.