

## **A Biomedical Image Processing Approach to Detect Diabetic Retinopathy using Convolutional Neural Network (CNN)**

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Diabetic Retinopathy is the most popular Eye disease in Sri Lanka that occurred in the working-age population and it is led to vision loss. The phase classification of diabetes retinopathy (DR) was considered a vital step in assessing and managing diabetes retinopathy. Early detection is one of the main challenges, which is extremely important for the successful treatment. The precise identification of the stage of diabetic retinopathy is unfortunately difficult and involves expert interpretation of fundus images. In many adjoining subjects and for the diagnosis of diabetic retinopathy, Convolutional Neural Networks (CNN) have been widely employed. 3,755 retinal images were obtained from Kaggle Database and included in the training and testing dataset. This study proposed the novel retinal image enhanced techniques using Green Channel, Grayscale, Contrast Limited Adaptive Equation (CLAHE), and Gamma Correction that contrast and extract the features of retinal images that needed to classify. Most of the researchers had only used the Green channel and Gray Scale image to predict the result and using Support Vector Machine as a classifier. In this study, using Inception V3 model and VGG 16 model that inside in the CNN as classification, different accurate prediction results were found. The VGG 16 model provided 95.12% accuracy and the Inception V3 model provided 51.03% accuracy. According to two CNN models, VGG 16 is providing better prediction accuracy in novel image enhancement applying retinal images, when compared to other available models.

**Key words:** *Diabetic retinopathy, Convolutional Neural Network*

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