

Deep Learning for Diabetic Retinopathy Disease

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Abstract: Diabetic Retinopathy (DR) is a human eye disease that affects diabetics and damages their retina, potentially leading to blindness in the long term. DR has been manually tested by ophthalmologists until now and is a time-consuming process. As a result, this job (project) will focus on analyzing various DR levels using Deep Learning (DL), which is a derivative of Artificial Intelligence (AI). We used an enormous dataset of around 3662 train images to train a model called DenseNet to automatically detect the DR point, which is then categorized into high resolution fundus images. The dataset we're using is free to use on Kaggle. There are five different DR stages: 0, 1, 2, 3, and 4. The input parameters in this paper are the patient's fundus eye pictures. The features of fundus images of the eye will be extracted by a qualified model (DenseNet Architecture), and then the activation function will provide the output. The precision of this architecture for DR detection was 0.9611 (quadratic weighted kappa score of 0.8981). Finally, we compare the two CNN architectures, the VGG16 architecture and the DenseNet121 architecture.

Keywords: Deep Learning, Diabetic Retinopathy (DR), Densenet 121 Architecture, VGG16 Architecture, Dataset, Fundus Camera.

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