DIABETIC RETINOPATHY DETECTION USING DEEP LEARNING

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Abstract: Diabetic retinopathy (DR) is a rapidly expanding illness caused by diabetes that affects people all over the world. Diabetic patients may get full vision loss as a result of the DR. In this situation, early detection of DR is even more critical in order to restore vision and provide assistance for timely treatment. The identification of DR can be done manually by ophthalmologists or automatically by a computerized method. Develop a method to automatically recognise diabetic retinopathy features in colour digital retinal pictures and assess its use in diabetic retinopathy screening. Ophthalmologists are now manually screening Diabetic Retinopathy (DR) that is a time consuming process. This work focuses on applying Deep Learning (DL), a subset of Artificial Intelligence, to analyse various DR stages (AI). To detect the DR stage and classify them into high resolution fundus images, we trained a network dubbed Mobile Net on a vast dataset of 3662 train images. The dataset we're working with is available on Kaggle (APTOS). The five stages of DR are zero, one, two, three, and four. Fundus eye pictures from patients are used as input parameters in this work. The features will be extracted from fundus images of the eye by a trained model, and the output will be provided by an activation function. This architecture detected DR with a precision about 0.9612. (Quadratic weighted kappa score of 0.8981). Finally, the two MobileNet architectures are compared.

Keywords: Deep learning, diabetic retina path, dataset, MobileNet

1. Introduction

Diabetic retinopathy is prevalent in people with diabetes. Annual screening for people with no retinopathy or light diabetic retinopathy, a follow-up exam in 6 months for people with moderate diabetic retinopathy, and a referral to an ophthalmologist for treatment review within a few weeks to months for people with severe or worse diabetic retinopathy or the presence of referable diabetic macular edoema, also known as clinically significant macular edoema, are the most common standards. There are five phases to DR: 0, 1, 2, 3, and 4. to detect retinopathy, doctors used a fundus camera that takes photos of veins and nerves behind the retina. Because there are no symptoms of DR in the early stages of the condition, it can be difficult to diagnose it. We used various MobileNet algorithms for early detection so that doctors could begin treatment at the appropriate moment. The dataset for this research was obtained from "Aravind Eye Hospital" and therefore is available on kaggle under the name "APTOS (Asia Pacific Tele Ophthalmology Society)". The outcomes of the two MobileNet topologies are compared and shown. AI models, notably "Deep Learning" in AI, have demonstrated to be the most accurate in discovering hidden layers in a range of AI applications, particularly in the field of medical image analysis, in recent projects and studies. The persistent consideration can be improved by deep learning models that identify disorders and aid medical decision-making (extra care).