TITLE OF THE PROJECT: DETECTION & CLASSIFICATION OF DIABETIC RETINOPATHY USING INCEPTION V3 AND XCEPTION ARCHITECTURES

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ABSTRACT

Diabetic Retinopathy (DR) is a common disease among those affected by diabetes that occurs when there is damage to the retina. This damage typically occurs when there is too much sugar in the blood, which can cause blockage of the tiny blood vessels that nourish the retina by cutting off its blood supply. As a result, the eye attempts to grow new blood vessels. But these new blood vessels are either poorly developed or weak. So, it can be leaked out easily. Even at its most severe, it may result in permanent blindness in patients who have had diabetic retinopathy for a long time. Therefore, it is necessary to diagnose these patients very soon to mitigate the severe impact of diabetic retinopathy. Several methods were proposed earlier to identify this disease using machine learning algorithms, image processing, and so on. Diabetic retinopathy detection contains three steps pre-processing of colour fundus images, diagnostic feature extraction and classification of diabetic retinopathy. In this work, a Convolutional Neural Network (CNN) based pre-trained transfer learning algorithm is used to speed up the diagnosis of the types of diabetic retinopathy using fundus photography of retinal images of patients. The images are of three different classes, which define the types of diabetic retinopathy. We used Inception V3 for diabetic retinopathy detection to detect whether a person has diabetic retinopathy or not, and Xception for diabetic retinopathy classification to classify what type of diabetic retinopathy it is. As a result, our research can help diabetic retinopathy patients reduce their chances of becoming blind for life.