A Multi-Kernel Sparse Dense Network (MKSDnet) For Retinal Disease Risk Classification

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Abstract: *The prevalence of eye diseases and the associated loss of vision have raised considerable concerns about global public health. Early detection and management are crucial to prevent permanent impairment and improve the chances of recovery for those affected. One way to discover eye diseases early is to use Machine Learning and Deep Learning algorithms to identify them. To do this, there are variety of pre-trained models available, such as VGG19, Xception ,MKSDnet and ResNet18. In this project, we suggested a model which comprises DenseNet modules and multi-kernel learning approach for classifying retinal fundus images automatically to determine the risk of vision loss. It uses retinal fundus images gathered from various populations. Images from various eye ailments, such as routine vision, Diabetic Retinopathy (DR), Age-Related Macular Degeneration (ARMD), and glaucoma, are included in the dataset. We have used about 860 retinal fundus images from the newly introduced Retinal Fundus Multi-Disease Image Dataset 2.0 (RFMiD2.0), respectively. Around 50 diseases are identified in RFMiD 2.0 Datasets. Early detection of those at risk for vision loss may facilitate prompt intervention, Improving treatment outcomes and lowering medical expenses. Additionally, automated classification techniques can aid healthcare professionals in efficiently evaluating many patients, facilitating the best resource allocation and treatment.*

Keywords: Deep learning, Retinal fundus images, Binary classification, Eye disease, Neural network.