Automated Detection and Classification of Diabetic Retinopathy Stages.

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Introduction

Eyes retina is affected by diabetes, causing blood vessels in the retina to rupture and due to some complication eventually causing permanent blindness. Luckily, we can take images of retina using retinopathy. These images can be utilized to detect Diabetic Retinopathy.

Proposed solution

Diabetic Retinopathy images are the solution to classify the disease at its early stages to prevent any upcoming damages the person might suffer from later. Using deep learning CNN models and machine learning to classify the Diabetic Retinopathy grades.

Implementation

1. Pre-processing.
2. Implementing Xception model
3. Implementing Resnet-50 model
4. Implementing EfficientNetB5 model
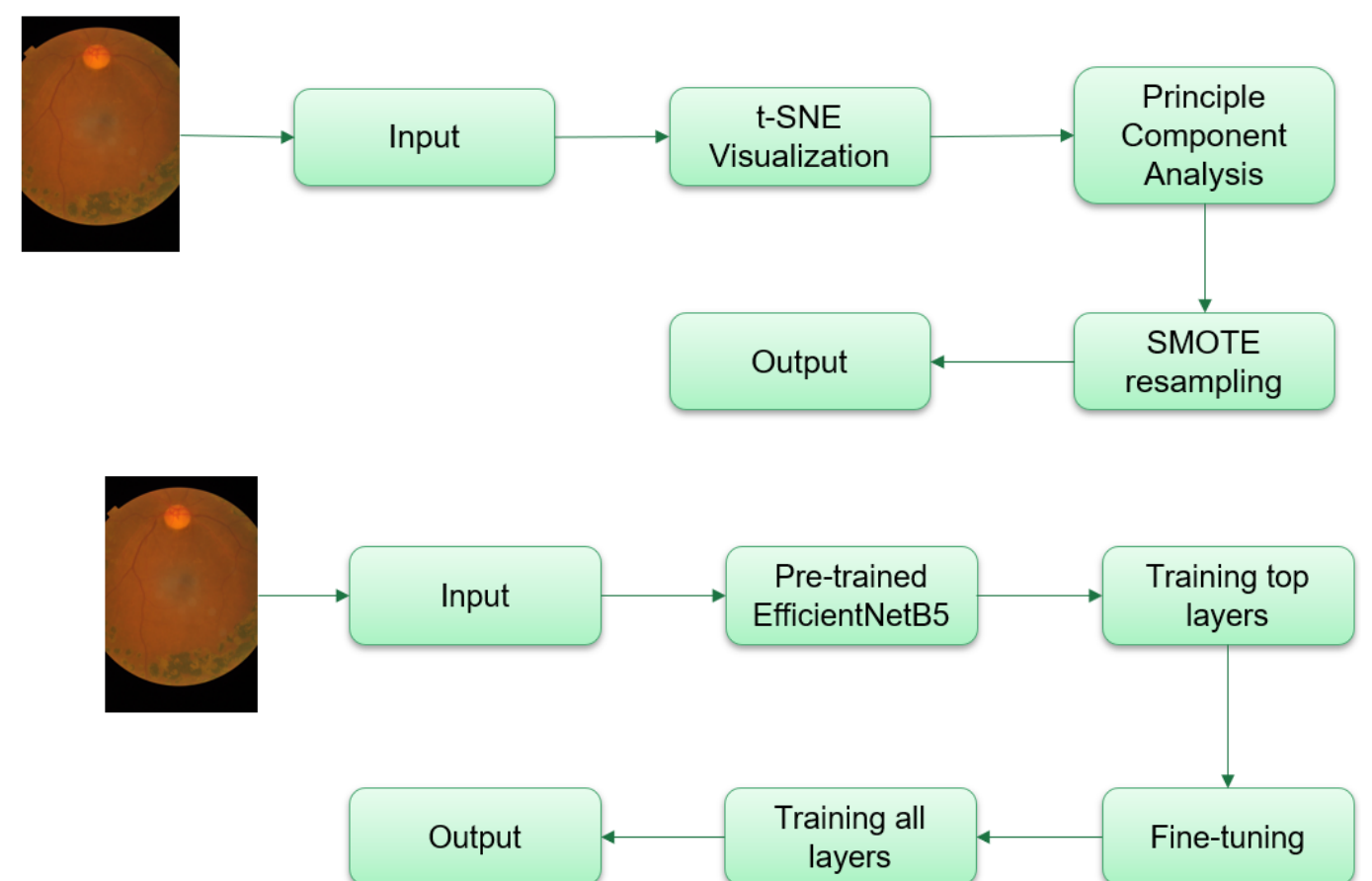5. Implementing Logistic Regression.

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Results

Detection whether retina healthy or infected: Xception achieved 100% for precision, recall and F-Score. 97% accuracy
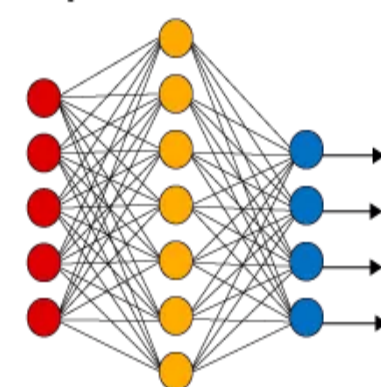
Classification of the grades: Logistic Regression outperformed other CNN model according to accuracy, precision and recall. EfficientNetB5 outperformed ResNet-50 in accuracy precision and recall.
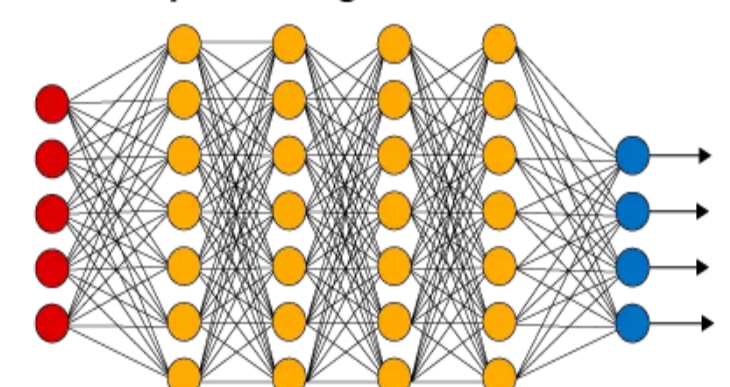

Conclusion

In this study, the Diabetic Retinopathy disease is evaluated through trained deep learning model to detect and identify the disease from given retinal images. The enhancement was achieved by the Logistic Regression model in the multiclass classification section as it reached 93% test accuracy and reduced the misclassification.