ABSTRACT

Deep learning models have demonstrated remarkable success in medical image classification, particularly in the context of diagnosing diabetic eye diseases. This study introduces a novel hybrid deep learning architecture that combines elements of the Inception and ResNet models for the classification of diabetic eye diseases, including Diabetic Retinopathy (DR), Diabetic Macular Edema (DME), glaucoma, and cataract. The proposed hybrid architecture leverages the strengths of both the Inception and ResNet models to enhance classification accuracy and robustness. By integrating the efficient feature extraction capabilities of the Inception model with the residual learning mechanism of ResNet, the hybrid architecture aims to capture intricate features and subtle patterns within fundus images, thereby improving disease classification performance. Evaluation of the hybrid Inception-ResNet model is conducted using a comprehensive dataset comprising fundus images sourced from multiple publicly available datasets. Performance metrics such as accuracy, recall, precision, and Area Under the Curve (AUC) are utilized to assess the efficacy of the model in accurately identifying diabetic eye diseases. Preliminary results indicate promising performance of the hybrid architecture, with notable improvements in classification accuracy compared to standalone Inception and ResNet models. The hybrid model achieves competitive results across all disease classes, demonstrating its potential as an effective tool for diabetic eye disease diagnosis.