



ID : 2328

Full Address : Sirin Mohammed Hejazi

Short Address : Riyadh Saudi Arabia

Abstract : **Objectives:** This study aims to develop and evaluate a deep learning-based framework for automated classification of retinal diseases using Optical Coherence Tomography (OCT) images, supporting early diagnosis and clinical decision-making. **Study Location:** The study was conducted using a publicly available OCT dataset collected from international clinical sources and accessed via the Kaggle platform, without restriction to a specific geographic region. **Methodology:** A CRISP-DM-guided methodology was adopted. OCT images were preprocessed and augmented to address class imbalance and enhance generalization. Five convolutional neural network architectures—3-layer CNN, 7-layer CNN, VGG16, ResNet50, and DenseNet121—were trained and evaluated using standard performance metrics, including accuracy, precision, recall, F1-score, and AUC-ROC. Model interpretability was enhanced using Grad-CAM visual explanations. **Results:** Experimental results demonstrated that DenseNet121 achieved the best overall performance, with 96% accuracy and an AUC-ROC of 0.97, while the custom 7-layer CNN also showed competitive performance. CNV was the most accurately classified condition, whereas Drusen remained the most challenging due to subtle structural features. Explain ability analysis confirmed that model predictions were based on clinically meaningful retinal regions. **Recommendations:** The proposed framework can be adopted as a clinical decision-support tool for retinal disease screening. Future research should focus on multi-center validation, integration of 3D OCT volumes, and uncertainty estimation to enhance clinical applicability.

Keywords : Optical Coherence Tomography Deep Learning Retinal Disease Classification Convolutional Neural Networks Explainable AI.

Authors in Arabic : سيرين حجازي - دكتور خالد اسكاف

Authors in English : Sirin Hejazi - Dr Khaled Eskaf

Research File: [Download file](#)

Status : Paid

Cost : 918.00



Print

Search:

ID	Research File	Created BY	Created At	Status
No data available in table				

Showing 0 to 0 of 0 entries

Previous Next