

HEART ATTACK PREDICTION USING RETINAL EYE IMAGES THROUGH A DEEP LEARNING APPROACH

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Cardiovascular diseases (CVDs), particularly heart attacks, continue to be among the leading causes of mortality worldwide, highlighting the urgent need for a reliable early risk assessment. This study proposes a novel non-invasive framework for predicting heart attack risk using images of the retinal fundus. Using the established anatomical correlation between the retinal vasculature and cardiovascular health, the proposed approach applies deep learning techniques to detect early indicators of cardiac risk. The system comprises several stages, including image preprocessing, vessel segmentation using the Canny edge detection algorithm, deep feature extraction through a pre-trained VGG19 network, and dimensionality reduction using Principal Component Analysis (PCA). The final classification is performed using the EfficientNet-B0 model, selected for its balance between high precision and computational efficiency. We have implemented a user-friendly GUI that enables easy upload of retinal scans for real-time heart attack risk prediction. The experimental results reveal high training accuracy and good validation accuracy, demonstrating the robustness and reliability of the model. By offering a scalable and cost-effective solution, this method has significant potential for clinical adoption, facilitating proactive cardiovascular screening, and improving patient outcomes through early intervention.