Comprehensive Diagnosis of Cardiovascular Diseases Through Retinal Image Analysis Techniques

Sivasankari
Assistant Professor, Department of Computer Science and Engineering, SRM Institute of Science and Technology, Ramapuram, Chennai, Tamil Nadu, India

M. Dinesh
UG Student, Department of Computer Science and Engineering, SRM Institute of Science and Technology, Ramapuram, Chennai, Tamil Nadu, India

E. Swetha
UG Student, Department of Computer Science and Engineering, SRM Institute of Science and Technology, Ramapuram, Chennai, Tamil Nadu, India

T. Haniya Mumtaj
UG Student, Department of Computer Science and Engineering, SRM Institute of Science and Technology, Ramapuram, Chennai, Tamil Nadu, India

Abstract

Cardiovascular diseases (CVDs) remain a leading cause of mortality worldwide, necessitating early prediction methods to mitigate their impact. Retinal imaging provides a non-invasive approach for evaluating cardiovascular health, as retinal vascular features are reflective of systemic conditions. This study leverages advanced convolutional neural networks (CNNs) to analyze retinal images, extracting critical biomarkers such as vessel density and tortuosity to predict CVD risks. By integrating large-scale datasets and optimizing deep learning models, the proposed approach demonstrates high accuracy and robustness in identifying individuals at risk. The findings highlight retinal imaging's potential as a cost-effective and accessible tool for large-scale CVD screening and early diagnosis, particularly in resource- constrained settings.

Keywords

Cardiovascular diseases, retinal imaging, convolutional neural networks, machine learning, biomarkers, non-invasive diagnostics.