

## Diabetic Retinopathy Detection by Means of Deep Learning

### Upendar Para

Department of Computer Science and Engineering, Keshav Memorial Institute of Technology, Hyderabad, India

### Nandini Tejawat

Department of Computer Science and Engineering, Keshav Memorial Institute of Technology, Hyderabad, India

### Nikshitha Varkala

Department of Computer Science and Engineering, Keshav Memorial Institute of Technology, Hyderabad, India

### Keerthika Kotturu

Department of Computer Science and Engineering, Keshav Memorial Institute of Technology, Hyderabad, India

### Vaeshnavi Lingampally

Department of Computer Science and Engineering, Keshav Memorial Institute of Technology, Hyderabad, India

### Abstract:

Diabetic Retinopathy (DR) is a severe eye disease caused by diabetes, often leading to blindness if not detected early. Traditional screening depends on manual examination of retinal fundus images by ophthalmologists, which is time-consuming and prone to errors. To address this, the project proposes an automated DR detection system using Deep Learning. The system employs Convolutional Neural Networks (CNNs) to analyze retinal images and detect key features such as microaneurysms, hemorrhages, and exudates, which indicate DR severity. The workflow includes image preprocessing (enhancement and normalization), feature extraction via CNNs, and a classification module that categorizes DR into stages: No DR, Mild, Moderate, Severe, and Proliferative. A final report generation module provides quick results for doctors and patients. The project will be implemented using Python, TensorFlow/Keras, and OpenCV for preprocessing and training on large datasets. This AI-driven solution enables early detection, automation, scalability, and affordability, improving patient care and preventing blindness.

### Keywords:

CNN, Deep Learning, Diabetic Retinopathy, Medical Image Processing, Retinal Images.