

ABSTRACT

The industrial revolution has significantly facilitated the growth of telemedicine and remote monitoring solutions. With the advent of Industry 4.0 and the increasing use of data, healthcare systems are becoming more advanced. Analyzing data related to diabetic eye diseases can provide efficient healthcare solutions. Diabetic retinopathy is a common complication of diabetes, where high blood sugar levels can damage the blood vessels in the retina. The proposed model can detect and analyze the progression of Proliferative Diabetic Retinopathy (PDR). In addition to that proposed model can predict diabetic-related diseases like Glaucoma and cataract. Hence our objective is to propose Artificial Intelligence model to handle diabetic associated disease that commonly occur among people. This model aims to develop an advanced diagnostic system for the detection of those diseases using retinal images. Going beyond the conventional approaches, proposed a novel methodology that integrates multi-modal data and employs explainable Artificial Intelligence (AI) techniques to enhance accuracy and interpretability. The project utilizes a diverse dataset, including retinal images, patient histories, genetics, and lifestyle data. A multimodal fusion framework extracts features capturing subtle Proliferative Diabetic Retinopathy variations. Alongside precise diagnosis, the study introduces longitudinal analysis for those disease progression prediction. Proposed model not only classifies the diseases but also provides transparent insights into its decision-making process, empowering clinicians to validate and understand the predictions. The outcomes of this project extend beyond conventional eye disease detection by offering an interpretable AI-powered tool for clinicians. The system holds promise for revolutionizing eye diseases management, promoting early detection, and providing tailored interventions for patients.