DIABETIC RETINOPATHY CLASSIFICATION USING QUANTUM ASSISTED DEEP LEARNING(HYBRID MODEL)

DOMAIN:DEEP LEARNING(CONVOLUTIONAL NEURAL NETWORKS,QUANTUM NEURAL NETWORK)

TEAM MEMBERS:
G. Manvitha(20761A1280)
V. Chandana(20761A12C4)
A. Prakash(20761A1202)
J.D.L.Nandini(20761A1285)

GUIDE:
Mr. M. Vijay Kumar
(Sr. Assistant Professor)

ABSTRACT:

Diabetic retinopathy (DR) is a growing concern in India, often referred to as the "diabetic capital," with a projected doubling of cases in the next two to three decades. This ailment, stemming from diabetes, may lead to blindness and significantly reduce a person's productive life..Quantum computing has emerged as potential solution to this challenge.The integration of quantum computing with conventional image classification methods offers theoretical feasibility and advantages. However, existing image classification techniques have often fallen short in achieving high accuracy.To address this, our research introduces a quantum-based deep convolutional neural network.Our hybrid model unites Convolutional Neural Networks (CNNs) with quantum-assisted deep learning for the classification of DR. While the CNN analyzes retinal images, extracting pertinent features, the quantum component processes complex and high-dimensional quantum data derived from these scans, revealing deeper insights into the molecular and cellular changes associated with the disease.This integration enables a comprehensive analysis of diabetic retinopathy. The model accurately predicts the severity of DR, facilitating early diagnosis. We present promising results, showcasing the potential of this hybrid model to enhance the accuracy and efficiency of DR diagnosis. By leveraging cutting-edge CNN technology and quantum-assisted deep learning, our research aims to address the urgent healthcare challenge of diabetic retinopathy detection, offering significant benefits to both patients and clinicians.

EXISTING SYSTEM:

- "Diabetic retinopathy using CNN"
- Diabetic retinopathy is a condition where the blood vessels in the retina are damaged due to diabetes.
- Convolutional Neural Networks (CNNs) can be used for the detection and diagnosis of diabetic retinopathy from retinal images.
- Gather a large dataset of retinal images, including both normal and diabetic retinopathy cases. Preprocess the images by resizing, normalizing, and augmenting them to improve the model's perform.
- Design a CNN architecture for the task. Split your dataset into training and validation sets. Train the CNN using the training data.Assess the model's performance using metric like accuracy.
- Developing and maintaining CNN-based diagnostic systems can be costly, especially if it involves high-resolution imaging equipment and infrastructure.

PROPOSED SYSTEM:

- "Diabetic retinopathy classification using quantum assisted deep learning (hybrid model)"
- Collect and preprocess the retinal images, preparing them for further analysis.
- Quantum computing can potentially offer advantages in feature extraction. Once the quantum feature extraction is complete, the processed features can be fed into a deep learning model, such as a Convolutional Neural Network (CNN).
- The deep learning model can further analyze and classify the retinal images based on the quantum-extracted features.
- The hybrid model is trained using a combination of classical and quantum optimization techniques to fine-tune the deep learning component.
- The potential advantage of the hybrid model is quantum speedup, which can significantly reduce the time required for complex feature extraction and processing, potentially improving the overall classification performance.
- Finally, high accuracy can be archived with the hybrid model

LITERATURE SURVEY:

S.No	TITLE	AUTHORS	DESCRIPTION
1	A Novel DR Detection Approach Based On Deep Symmetric CNN	Tieyuan Liu, Yi Chen, Hongjie Shen, Rupeng Zhou	They used CNN to detect the severity of diabetes.
2	Lightweight DNN Architecture for Detecting referable DR	Ahmad Bukhari Aujih, Mohd Ibrahim Shapiai, Tong Boon Tang	They proposed EDR-NET that achieved predictive performance comparable with current state of the arts in detecting DR.
3	Multi-Stream DNN for DR Severity Classification under a Boosting Framework	Hamza Mustafa, Syed Farooq Ali, Muhammad Bilal	They proposed multi stram deep network and take advantages of the deep networks and PCA to learn inter-class and intra-class variations
4	Diabetic Retinopathy Analysis Using Machine Learning	Sohini Roychowdhury, Dara D Koozekanani, Keshab K Parhi	They used Classifiers such as the Gaussian Mixture model (GMM), kNN. SVM for classifying retinopathy lesions from nonlesions.
5	Internet of Things and Deep Learning Enabled Diabetic Retinopathy Diagnosis Using Retinal Fundus Images	Thangam Palaniswamy, Mahendiran Vellingiri.	They proposed Computer-Aided Diagnoses (CAD) model based on retinal fundus image is a powerful tool to help experts diagnose DR.

THANK YOU