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DIABETIES RETINOPATHY DETECTION USINGDEEP LEARNING

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ABSTRACT
Diabetes causes blood sugar to rise due to lack of insulin. Diabetes affects the retina, heart, blood ves sels and kidneys. A major complication is diabetic retinopathy. One of the best ways to identify diabetic retinopathy, it has the flexibility to reduce cost and time and is more effective tha n manual identification. Deep learning technology enables computerized diagnosis. This article focus es on finding solutions to the early stages of diabetic retinopathy. Using artificial intelligence and dee p learning, doctors can detect blindness before it occurs. In this project we use observational learning to analyze the financial statement. For this study, we use a variety of image processing techniques an d filters to enhance various key features such as microaneurysms, hemorrhages, exudates, vascular in flammation, etc., which are fundus imaging features that indicate diabetic retinopathy in a given indi vidual, followed by a neural network. fordistribution. Using ResNet architecture to classify fundus i mages with 82% accuracy.

KEYWORDS:
- Deep learning Diabetic Retinopathy ResNet

INTRODUCTION
Diabetes Mellitus is indeed a complex condition with various forms, but your summary highlights some key aspects well. Type 2 diabetes, in particular, is increasingly prevalent globally, with lifestyle factors such as obesity and physical inactivity playing significant roles in its development. It's concerning that this type is now affecting children as well.The distinction between Type 1 and Type 2 diabetes is crucial, as Type 1 requires daily insulin injections for survival due to the body's inability to produce insulin, while Type 2 often involves insulin resistance or insufficient insulin production, potentially managed with lifestyle changes, oral medications, and, in some cases, insulin therapy.Gestational diabetes is another important variant to consider, as it occurs during pregnancy and can affect both the mother and the baby's health. Its diagnosis through prenatal testing underscores the importance of early detection and management to prevent complications for both the mother and child.Your summary effectively captures the urgency of recognizing and managing diabetes, given its potential to cause serious complications when left uncontrolled. Early detection, lifestyle modifications, and proper medication management are crucial for mitigating its impact on individuals' health and well-being.

LITERATURE SURVEY
These excerpts provide a comprehensive overview of various approaches and methodologies for diagnosing and classifying diabetic retinopathy (DR) using deep learning techniques and image analysis. Here's a breakdown of the main points:
1. **EfficientNET for Diabetic Retinopathy Diagnosis**: Chetoui and Akhloufi propose using EfficientNET, a state-of-the-art convolutional neural network (CNN), to detect and classify diabetic retinopathy threats. They achieve high AUC values, indicating strong performance in diagnosing DR and detecting threats associated with it.

2. **VGG Architecture with Genetic Algorithms**: Sudarmadji et al. present a method that combines deep learning with genetic algorithms to classify DR levels. They achieve high accuracy, sensitivity, and specificity, demonstrating the effectiveness of their approach, especially when applied to the Messidor and Kaggle databases.
3. **Imaging Techniques and Analysis**: Mukherjee et al. discuss various imaging techniques and analysis methods for diagnosing DR. They emphasize the importance of preprocessing, feature extraction, and detection techniques such as optic disc detection and blood vessel extraction. Their approach aims for accurate diagnosis, particularly at an early stage, utilizing comprehensive computer-aided diagnosis (CAD) systems.
4. **Diagnosis and Segmentation Challenges**: Kumaran and Patil highlight the challenges in DR diagnosis, particularly in image segmentation. They provide insights into the difficulties faced by machine learning algorithms in processing fundus images and emphasize the importance of identifying specific characteristics of retinopathy for accurate diagnosis.
5. **Feature Extraction and Morphology-Based Methods**: Several studies, including those referenced by Hann et al. and Walter et al., propose morphology-based methods for feature extraction from fundus images. These methods focus on identifying key diagnostic features such as exudate presence and retinal leaks, utilizing techniques like grayscale transformation and morphological reconstruction.
6. **Frequency Modulation and Blood Vessel Filters**: Agurto et al. and KazakhBritish et al. explore methods based on frequency modulation and blood vessel filters to distinguish normal and diseased retina. These approaches leverage image processing techniques and numerical experiments to classify fundus images based on the severity of DR.
7. **APTOS 2019 Blindness Assessment Dataset and CNN**: Finally, the study referenced in the last excerpt utilizes the APTOS 2019 dataset for DR detection, employing CNN architecture. They use pixel normalization techniques to identify various medical conditions in retinal images and classify them accordingly.
Overall, these excerpts demonstrate the breadth of research and innovation in using deep learning and image analysis techniques for diagnosing and classifying diabetic retinopathy, aiming to improve early detection and patient outcomes..

CONCLUSION

We explore the fundamentals of neural networks, Densenet, VGG16, VGG19, ResnetInception V2 an d deep modelling. We delve into the main techniques of convolution, pooling, etc., activation and ma ny other applications for image processing, and CNNs for image classification. Although many tasks today can be successfully implemented using predefined models, and these models are easily accessi ble through TensorFlow Hub and platforms such as Kaggle and Git Hub, it is still difficult to underst and the role of each layer in a significant neural network and how they interact. So this article is desi gned to walk you through the process of building a CNN from scratch, and I plan to bring more book s like this to other deep learning and design projects. The accuracy of our model to predict the validit y of the data list is 74%, 98%, 72%, 84%, 95%, 60%, 52%, which is good and can be classified by ch ecking all the information about the model. Among them, Densenet and VGG19 oversampling achie ved the highest accuracy in identifying and classifying diabetic retinopathy. I hope this article will pr ovide guidance for those just starting to explore ConvNets, VGG16, VGG19, Resenet inceptionv2, d ense network, and deep neural network models, and even help them adjust to some of the roots of the old ones. Especially try your own development and testing.

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