

Project Document: Automated Diabetic Retinopathy Detection and Classification

Submitted By
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Abstract:

This project aims to develop an user interface for the early detection and classification of Diabetic Retinopathy (DR) using Transfer Learning and flask. This system has the potential to significantly improve the efficiency and accuracy of DR diagnosis, ultimately reducing the risk of vision loss for diabetic patients.

1. Problem and Motivation:

- Problem: Diabetic Retinopathy (DR) is a frequent complication of diabetes, causing retinal lesions that can lead to irreversible blindness if left untreated. Current manual diagnosis by ophthalmologists is time-consuming, expensive, and prone to human error.
- Motivation: Early detection and prompt intervention are crucial in preventing vision loss from DR. Automated systems based on transfer learning offer a promising solution for accurate and accessible diagnosis.

2. Proposed Solution:

This project will develop a web application integrated with a transfer learning model capable of:

- Detecting DR in images.
- Classifying DR severity (e.g., mild, moderate, severe).
- Providing clear results on a user-friendly interface.

3. Technical Approach:

- Data Collection and Preprocessing:
 - A dataset of annotated fundus images will be gathered and preprocessed.
- Model Building:
 - A pre-trained convolutional neural network (CNN) like Xception will be employed for feature extraction.
 - Additional dense layers will be added and trained to perform DR detection and classification.

- Application Development:
 - A web application will be built using Flask to integrate the trained model and provide a user interface for image upload and result visualization.

4. Project Flow:

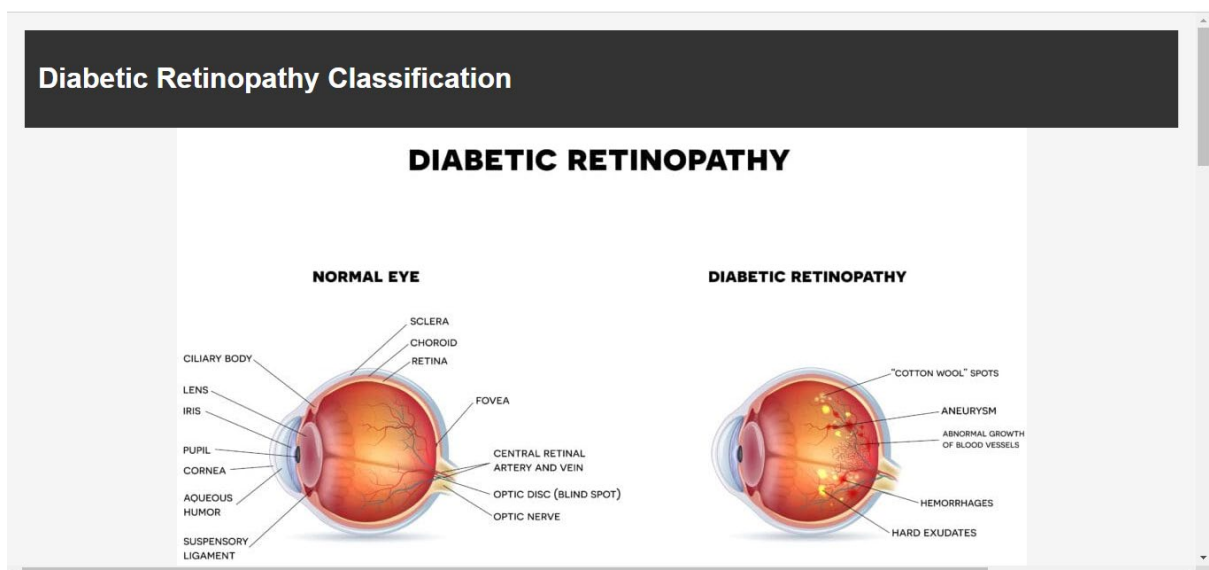
- User selects a DR image through the web app UI.
- The image is sent to the Flask application and analyzed by the trained model.
- The Xception model extracts features, and the final prediction is generated.
- The prediction (DR presence and severity) is displayed on the user interface.

5. Expected Outcomes:

- An accurate and efficient model for DR detection and classification.
- A user-friendly web application for easy and accessible DR diagnosis.

6. Project Images:

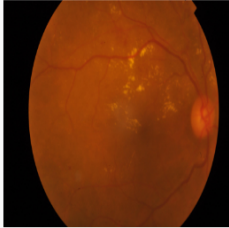
The images below depict the prediction of moderate NPDR (example) by the model.



is time, short and cost-consuming and prone to misdiagnosis unlike computer-aided diagnosis systems.

Upload Image Below To Identify the Type of DR

Choose...



Predict

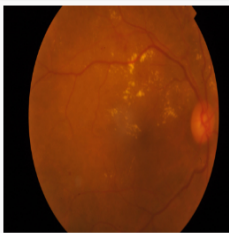
Check the image below to know more about the type of DR identified

Diabetic Retinopathy Classification

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Upload Image Below To Identify the Type of DR

Choose...



Result: The Classified DR Type is : Moderate NPDR

Check the image below to know more about the type of DR identified