Project Design Phase-II
Technology Stack (Architecture & Stack)

Date	03 October 2022
Team ID	PNT2022TMID08044
Project Name	Project - Deep Learning fundus image analysis for Early Detection of Diabetes Retinopathy
Maximum Marks	4 Marks

Technical Architecture:

The Technical Stack has the following process:

Data Collection

Data Preprocessing

Model Building

Cloudant DB

Application Building

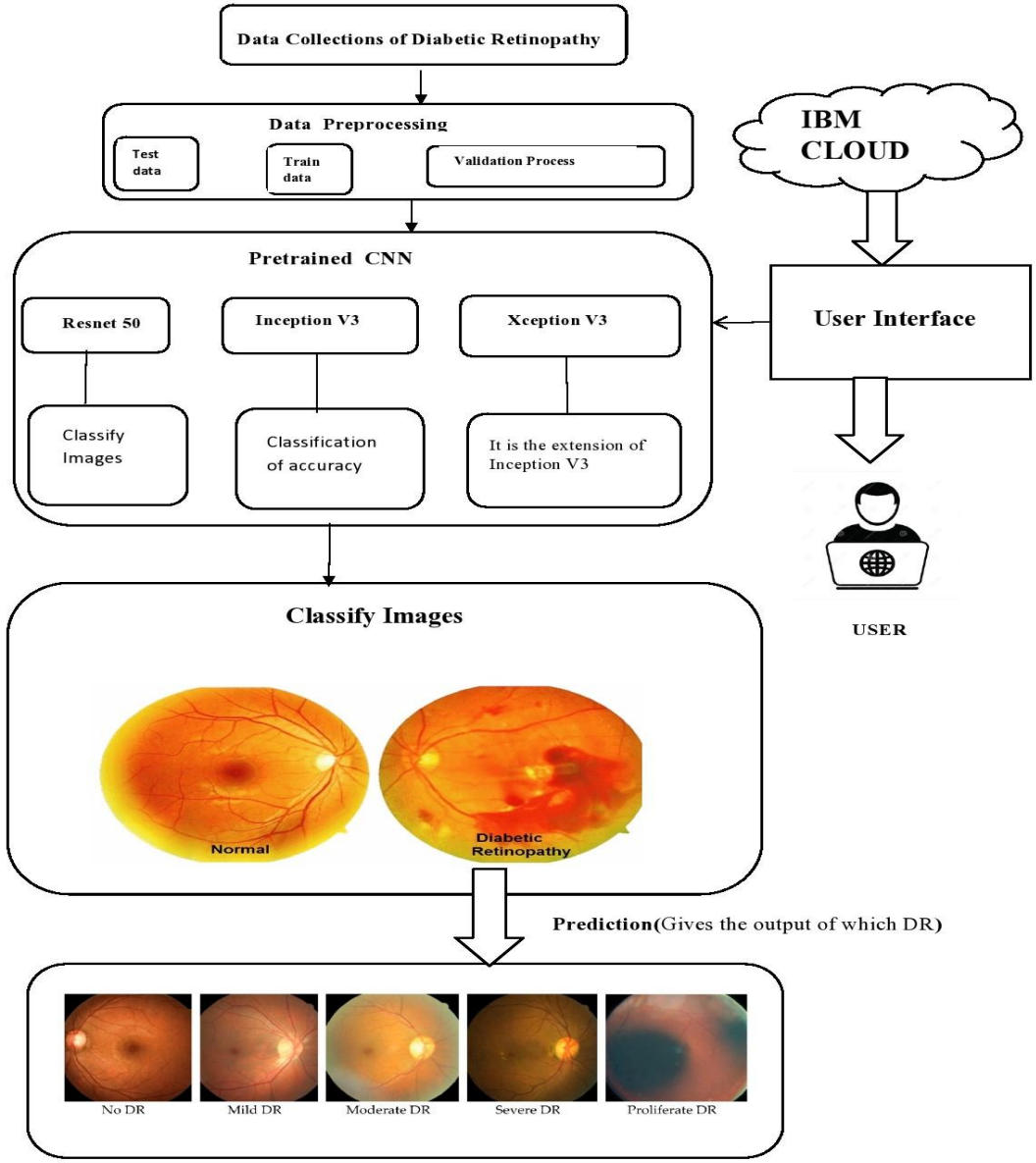
Data Collections of Diabetic Retinopathy
Data Preprocessing
Test data
Train data
Validation Process
IBM CLOUD
Pretrained CNN
Resnet 50
Inception V3
Xception V3
User Interface
Classify Images
Classification of accuracy
It is the extension of Inception V3
USER
Classify Images
Normal
Diabetic Retinopathy
Prediction(Gives the output of which DR)
No DR
Mild DR
Moderate DR
Severe DR
Proliferate DR

Table-1 : Components & Technologies:

S.No	Component	Description	Technology
1.	User Interface	The user interacts with the web UI	HTML, CSS, JavaScript ,Flask,Python
2.	Application Logic-Registration	The user registers the details in the web UI	Flask,IBM Cloudant DB
3.	Application Logic-Authentication	The user confirms the registration ,whether he/she is authorized user by confirmation of the mail	E-mail,Flask ,IBM Cloudant DB
4.	Application Logic-Login	The user log in the application to verify the registered credentials are available in the database	Flask, IBM Cloudant DB
5.	Application Logic-User gives the image as input	The user gives the input of the Diabetes Retinopathy image as input and uploads the image as file	Flask, IBM Cloudant DB
6.	Application Logic- Image Pre processing	The given input from the user is pre processed	Flask, IBM Cloudant DB
7.	Application Logic- Image Classification with the dataset	The Pre-processed image is analysed with the dataset and image classification is done whether the given image is predicted as Diabetes Retinopathy or normal image	Flask, IBM Cloudant DB
8.	Application Logic-Display the output	The result is displayed	Flask, IBM Cloudant DB
9.	Application Logic- Save the data	The analysed and predicted output is saved in the database	IBM Cloudant DB
10.	Machine Learning Model	The Image classification and analysis is being done and predicts the result of the given input image	CNN-Xception V3,Resnet 50,Inception V3
11.	Database	The database is used to store the data of all the given inputs	IBM Cloudant DB
12.	File Storage	The files and data are stored for future reference	IBM Block storage
13.	Deployment	Application Deployment on Cloud	Cloud foundry

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	Google Colab is used as a open source framework	Google Colaboratory
2.	Security Implementations	Some encryption methods can be used to protect the application	SHA-256, Encryptions, IAM Controls
3.	Scalable Architecture	Justify the scalability of architecture (3 – tier, Micro-services)	IBM Cloud pak
4.	Availability	The availability of requested data in the application can in the form of Load Balancer where the queuing of data is available.	Application Load Balancer
5.	Performance	The request of the cache and other data can be given for a particular range of times as the application can get the CDNs from the server	Proxy server