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Detection of Eye Infection and Diabetics

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***Abstract*—Early Stage of Diabetic Retinopathy is Linked With Pre-DiabetesinhumanwhichcausesOtherHealthissuesorGives birth to new disease. To avoid Blindness in early stage detection of retinopathy is essential.There are Various paramater to Detect Like eye viens dilation,white spot,intensity causing complication like Vitreous hemorrhage, Retinal detachment, Glaucoma, Blindness. In this project we focuses on decision about the presence of disease by applying ensemble of machine learning classifying algorithms on features extracted from output of different retinal image processing algorithms, like diameter of optic disk, lesion specific (microaneurysms, exudates), image level (pre-screening, AM/FM, quality assessment). Decision making for predicting the presence of diabetic retinopathy was performed using alternating decision tree, adaBoost, Naive Bayes, Random Forest.**

I. INTRODUCTION:

HEALTHCARE information systems tend to capture data in databases for research and analysis in order to assist in making medical decisions. As a result, medical information systems in hospitals and medical institutions become larger and larger and the process of extracting useful information becomes more difficult. Traditional manual data analysis has become inefficient and methods for efficient computer based analysis are essential. To this aim, many approaches to computerized dataanalysishavebeenconsideredandexamined.Datamining represents a significant advance in the type of analytical tools currently available. It has been shown to be a valid, sensitive, and reliable method to discover patterns and relationships. It has been proven that the benefits of introducing data mining into medical analysis are to increase diagnostic accuracy, to reduce costs and to reduce humanresources

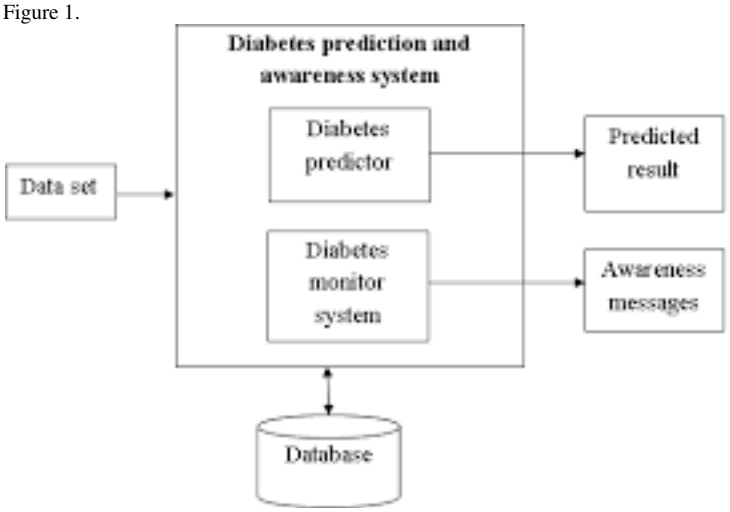
In recent times, the number of people suffering from diabetes is increasing day by day. It is a disease in which body does not produce insulin or use it properly. This increase the risks of developing, kidney disease, blindness, nerve damage, blood vessel damage and contribute to heart disease There are two types of diabetes; Type-1 diabetes – also called insulin dependent and type-2 diabetes which is with relative insulin deficiency. Patients with type 2 diabetes do not require insulin cure to remain alive, although up to 20% are treated with insulin to control blood glucose levels To diagnose diabetes disease at an early stage is quite a challenging task due to complexinterdependenceonvariousfactors.Thereisacritical need to develop medical diagnostic decision support systems which can aid medical practitioners in the diagnostic process. ThisstudydealsabouttheclassificationofTypeIIdiabetes.

II. EXISTINGSYSTEM

The Diabetes Data set is given as input to the Diabetes prediction and awareness system. The Diabetes predictor helps in prediction of diabetes based on the symptoms provided. The Diabetes monitor sys- tem helps in monitoring the blood sugar level and provides the awareness message are provided to theusers.

Figure 2.

Figure 1.



Yasodaet al. classified PIMA diabetes data set with different machine learning algorithms such as Bayes Network classifier, REP tree, Random tree, J48 and appriori [7]. Ming-Yan et al. designed an expert system that can diagnose thediabetes [8].

Han et al. implemented a classifier on PIMA dataset by decision tree that was formed with RapidMiner [9]. Jayalakshmiet al. designed a system that was applied to PIMA dataset for classification aim. The system made us of Artificial Neural Network for classification [2]..

Aroraet al. used UCI database for both classification and comparisonoftheclassificationmethodstheyused.Theymade use of 5 different dataset (including PIMA) from UCI and appliedJ48andMultilayerPerceptron(MLP)forclassification and comparison aims[12].

III. PROPOSEDARCHITECTURE

The System architecture is shown in the Fig 2.2 Different data mining techniques have been used to help health care professionals in the diagnosis of Diabetes disease. Those most frequently used focus on classication: Support Vector Machine decision tree, and neural network . Other data mining techniques are also used including kernel density, automatically dened groups, bagging algorithm and supportvector machine. Though applying data mining is benecial to healthcare, disease diagnosis, and treatment, few researches have

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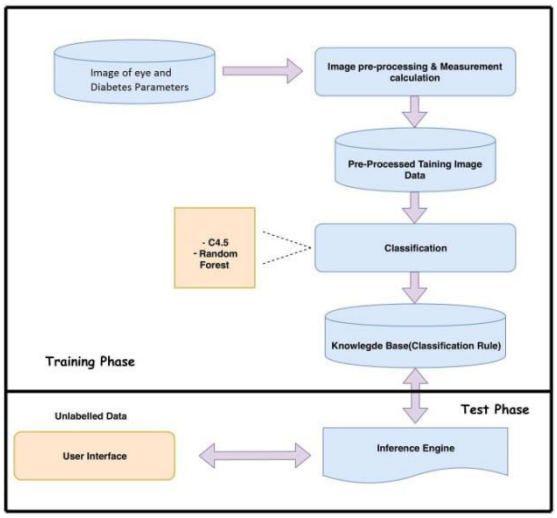
Figure 3. Proposed system



investigated producingtreatment plans for patients. The main issue in the diabetes data classication is that due to in sucient resources and data proper mining has not been done. To overcome issue of the data mining in healthcare proper data anomalies have to be pre-processed and redundancy must be removed from the dataset.

Steps for implementation:

1. CaptureImage&StoreitintothelocalDB
2. Predict ForInfection
3. Predict ForDiabetics
4. PredictResult
5. Generation Report Using GraphicalTechnique

IV. METHODS OFIMPLEMENTATION

The main part is to detect the eye from human face from current frame or from image captured by camera. Then the captured images will send for storing purpose. The stored image will be used to detect the face one by one and to compare between stored (in database) face image and face detected from captured image. So, we have discussed method for face detection using Viola-Jones algorithm or use framework openCV. The method follows steps as given below.

Step 1: Capture the current frame/ image using camera .

Step2:PasstheCurrentCapturedImagetoInfectionSystem Step 3: Result of Infection will be stored into the Database Step 4: Pass the Current Captured Imageto Diabetics System

Step 5: Result of Diabetics will be stored into the Database

Step 6: With the help of Infection and Diabetics Result we predict our final result and generate report

A. Algorithms

1) Naive Bayes: The Naive Bayes algorithm is simple and effective and should be one of the first methods you try on a classification problem The Naive Bayes algorithm is an intuitive method that uses the probabilities of each attribute belonging to each class to make aprediction. It is the supervised learning approach you would come up with if you wanted to model a predictive modeling problem probabilistically.

Naive bayes simplifies the calculation of probabilities by assuming that the probability of each attribute belonging to a given class value is independent of all other attributes. This is a strong assumption but results in a fast andeffective method.

The probability of a class value given a value of an attribute is called the conditional probability. By multiplying the conditional probabilities together for each attribute for a given class value, we have a probability of a data instance belonging to thatclass.

To make a prediction we can calculate probabilities of the instance belonging to each class and select the class value with the highest probability.Naive bases is often described using categorical data because it is easy to describe and calculate using ratios. A more useful version of the algorithm for our purposes supports numeric attributes and assumes the values of each numerical attribute are normally distributed (fall somewhere on a bell curve). Again, this is a strong assumption, but still gives robustresults.

2) Random Forest: Random forest algorithm is a supervised classification algorithm. As the name suggest, this algorithm creates the forest with a number oftrees.

In general, the more trees in the forest the more robust the forest looks like. In the same way in the random forest classifier, the higher the number of trees in the forest gives the high accuracyresults.

If you know the decision tree algorithm. You might be thinking are we creating more number of decision trees and how can we create more number of decision trees. As all the calculation of nodes selection will be same for the same dataset.

V. IMPLEMENTATION

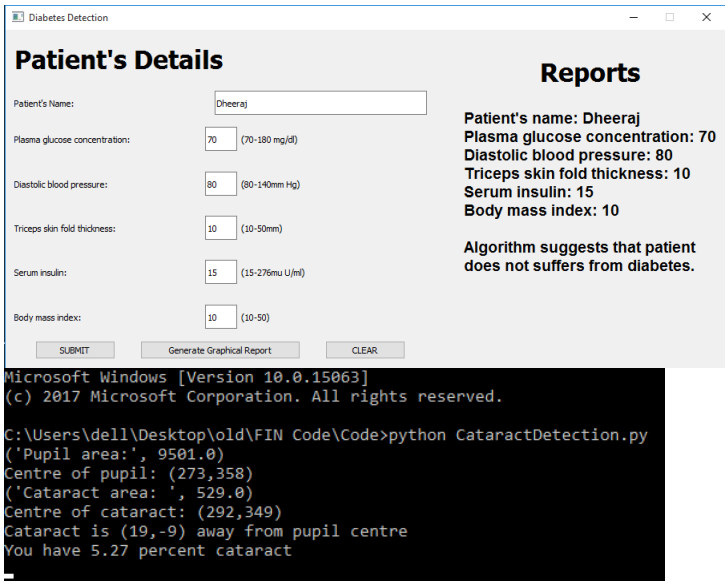
1) Pre-requirement
   CSVfiles
2) FeatureExtraction
   I. Time series data t =r
   II. Extract statistical features for data att = r
   III. Fromsetoffeaturesvectorsfromalgoatt=r

//Feature mapping

   i. Diastolic bloodpressure
   ii. Triceps skin fold thickness
   iii. Body Mass Index (BMI)

3) Classificationphase
   I. Training set of 70% to build a newalgorithm
   II. New algorithm testing set (80%)
   Classification & doneprediction.
4) END

VI. OUTPUT

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Microsoft Windows [Version 10.0.15063]
(c) 2017 Microsoft Corporation. All rights reserved.

C:\Users\dell\Desktop\old\FIN Code\Code>python CataractDetection.py
('Pupil area:', 9501.0)
Centre of pupil: (273,358)
('Cataract area: ', 529.0)
Centre of cataract: (292,349)
Cataract is (19,-9) away from pupil centre
You have 5.27 percent cataract
```

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