DIABETIC RETINOPATHY DISEASE DETECTION

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Abstract

Diabetic retinopathy is the most common diabetic eye disease and a leading cause of blindness. Regular screening for early disease detection has been a highly labor and resource intensive task. Hence automatic detection of these diseases through computational techniques would be a great remedy. The objective of project is to create a method that automatically detects diabetic retinopathy and classify them into proliferative and non-proliferative using classifier. To develop an automated method to detect diabetic retinopathy images of fundus are needed.

I.INTRODUCTION

Diabetic retinopathy is a diabetic eye sickness that in the long run causes visual deficiency, it is the consequence of harm to little veins and neurons of the retina. Age-related macular degeneration (AMD) is a decay or breakdown of the eye's macula.

Diabetic retinopathy (DR) and age-related macular degeneration (AMD) are these days two of the most incessant reasons for visual impairment and vision misfortune. In addition, high growth of the diseases will be experienced due to diabetes disease incidence increase and populous that is ageing in the present society. Their diagnosis at earliest stage through appropriate good treatment will reduce medical treatment costs generated when they are in early stage and later condition may become critical.

Nonetheless, a screening effort need a substantial workload for good trained specialists to determine and analyze the divergent and peculiar feature patterns of each ailment that added to the in danger populace increase that makes these campaign financially infeasible. In this way, the requirement for automatic programmed screening systems is highlighted. Based on these certainty, computer-aided diagnosis software trained for discriminating through image processing between a normal healthy fundus (without pathology), diabetic retinopathy and age related macular degeneration patients was developed.

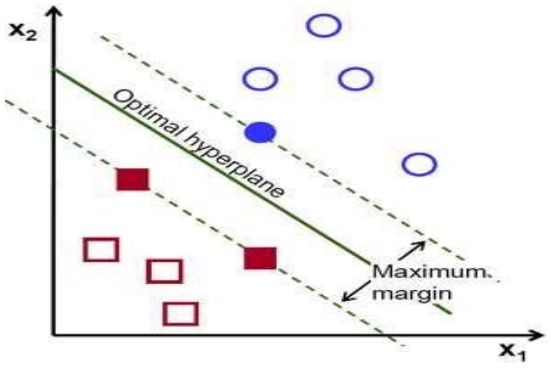
Local Binary Pattern (LBP) is a simple straightforward yet exceptionally efficient texture operator that works by labelling the pixels of an image by thresholding the circular neighbourhood vicinity of every pixel and returns the outcome as the binary number. Due to thediscerning power and computing simplicity of the LBP texture operator,it has eventually become a prominent approach in distinct applications.

The purpose of proposed work is to distinguish between normal fundus image, age-related macular degeneration (AMD) and diabetic

II.ALGORITHM

Support Vector Machine

SVMs (Support Vector Machines) technique is most useful for data classification. Data is separated into training and testing sets involving classification task. Each instance in the training set contains several attributes (i.e. the features or observed variables or the features) and one \target value" (i.e. the class labels). When the test data attributes are given the target values of the test data are predicted by SVM model (based on the1training data). A Support Vector Machine (SVM) is a discerning classifier precisely characterized by a separating hyper plane, the algorithm outputs an optimal hyper plane that categorizes new problems based on the supervised learning given labelled training data.



Finding an optimal hyperplane.

III.TESTING

Each program components are tested for errors to discover defects in the testing stage. The components may be any of the program functions, objects or modules. The integrated components are used in system testing to form the complete system. In this stage testing must be focused to establish the system that meets functional requirements and must be ensured that system does not behave in an unexpected way. Test data are inputs that are been devised and trained to test the system whereas test cases are inputs used to test the system and if the system works as specified with the given input the output is specified for the given input, the behavior is examined in a cohesive system. The test cases are opted for ensuring that the system behavior is examined in all the possible combinations of conditions considered.

Accordingly, system behavior that is expected under various combinations of conditions is given. Therefore test cases are selected which have inputs and the outputs on expected lines, inputs that are not valid and for which suitable messages must be given and inputs that do not occur frequently which can be regarded as special cases.

In this chapter, several test cases have been explained with the underlying the proposed techniques.

Testing Strategy

The strategy that is used to perform unit testing is described below:

- **Features to be tested** – The features to be tested, most importantly include the operation of individual component for the proper execution of the entire program.
- **Items to be tested** – The items to be tested include all the individual units or functions, which collectively form the whole system. In case of unit testing the items to be tested, are the main graphical user interface, deploying the sensor nodes and handling the events in the sensor network.
- **Purpose of testing** – The purpose of the testing is to check the unit functionality of the main source of the project.
- **Pass/Fail Criteria** – The pass or fail criteria are designed with the basis of appropriate compilation of the main source file.

IV.CONCLUSION

As a result of the work, an automatic disease screening software is developed for identifying and distinguishing the AMD, DR and normal images. GLCM and LBP are used for feature extraction which makes it a better approach compared to other methods due the availability of a large number of features, the diabetic retinopathy stages are predicted for identifying the disease severity, the system is made to learn from the training data and is tried with another set of data of testing phase with support vector machine and neural network classifiers for guaranteeing the systems legitimate working. As a future work, a multi stage classification can be implemented to identify the severity of diseases.

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