Retinal Fundus Image Registration via Vascular Structure Graph Matching

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Abstract - *In this paper we discuss about the accurate eye disease detection by using a method at retinal fundus images. The proposed method in this paper is automated framework for multi modal fundus image registration and using a both color images and grayscale images and graph matching schemes into a functional and easy methodology. This comparison methodology are validated by a comprehensive set of comparisons against competing and well-established image registration and methods, by using real medical datasets and classic measures typically employed as a benchmark by the medical imaging community. The optimal transport theory enables great flexibility in modeling.*

We demonstrate the accuracy and effectiveness of the present framework throughout a comprehensive set of qualitative and quantitative comparisons against several influential state-of -the- art methods on various fundus image databases.

***Key Words*: Eye Disease Detection, Multi Modal Fundus Image Registration, Comparison Methodology.**

1. INTRODUCTION

According to the American Academy of Ophthalmology, glaucoma is a complicated condition that damages the optic nerve and is the major cause for blindness. In general, the glaucoma pathology can be broadly classified into two types: the "open-angle", and the "closed-angle" both of them described regarding the angle delimited between the iris and cornea. As the medical diagnosis is mostly accomplished by the human inquiry for glaucoma and other eye disorders, the use of image processing algorithms became a necessity especially when ophthalmologists need to manage a large set of fundus images. Such computing apparatus has paved the way for clinicians and medical specialists to cover more patients while still seeking for greater diagnostic accuracy. We propose the method that is used to predict all the eye disease with more accuracy. This framework uses comparison method of the images.

1.1 Motivation

Now a day many people are affected at more eye disease. So using that situation many doctors and hospitals are easily theft more money from patients. The common peoples are mostly affected by this problem. We propose the method is used to predict the disease accurately. Then it detects all the eye disease easily. That is used to detect all the eye related diseases like glaucoma, Age-related macular degeneration, Diabetic retinopathy, Retinitis pigmentosa and so on. It provides more accuracy with less computation time.

1.2 Objective

- Predict the disease accurately.
- Detecting disease at less computation time.
- Provide more accuracy.
- Detects all kinds of eye disease.

2. SYSTEM SPECIFICATION

2.1 Hardware Requirements

- Processor : Intel processor 3.0 GHz
- RAM : 2GB
- Hard disk : 500 GB
- Compact Disk : 650 Mb
- Monitor
- Mouse and Keyboard as Input Devices

2.2 Software Requirements

- Front End : PYTHON
- Back End : MYSQL
- Server : WAMP
- Operating System: Windows OS
- System type : 32-bit or 64-bit OS
- IDE : Python 3.5.1
- DLL : Depends upon the title

3. SYSTEM ARCHITECTURE DIAGRAM

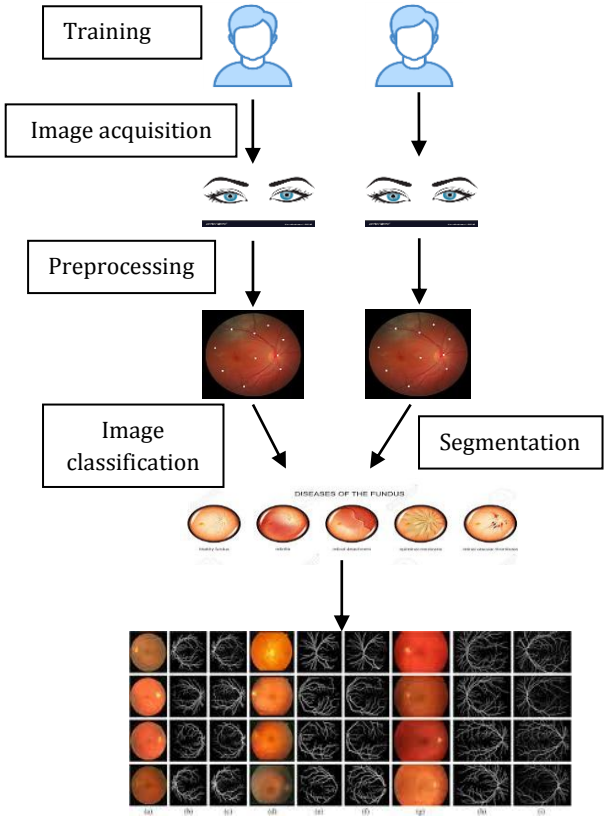

Chart -1: System Architecture

4. MODULES OF THE PROJECT

4.1 Data Acquisition

The disease affected image or not affected images are captured from camera or to upload the images. It is used to upload the pair of input images. However, it differs from conventional methods by using thermal images as inputs.

4.2 Preprocessing

The pair of images is preprocessed it by the process of fundus image vessel optimal alignment process. The main preprocessing is used as separate meaningful features. It is the process to extract the graph from fundus image. The fundus image is converted into binary image and used to extract the skeleton image.

4.3 Segmentation

The segmentation is the process of the skeleton fundus image graph is used to extract the fundus graph extraction. Then the process of the extracted graph is segmented. The graph extracted fundus images are matched it to find the same points.

4.4 Classification

The classification method is used to classify the object easily so we are detecting the object accurately. Then this method is used to refining a background objects accurately. Because the features obtained by Roe pooling operation are more accurate in the two stage methods, the predictions for classification and localization are both refined in that stage. We introduce a Background Refining stage as the second stage to complete the detection framework.

4.5 Feature Extraction

This method is used to predict the disease accurately from the fundus images. We remove the average pooling layers from the pre-trained model and add auxiliary convolution layers to detect large sizes of objects.

4.6 Performance Evaluation

This method is used to predict the disease. We now provide the different types of image features employed to achieve a context-relevant cost matrix. All features are computed regarding the input retinal images and collected at the nodes or from image patches around these nodes

5. CONCLUSIONS

The designed framework can be used in many cases difficult to be handled in real circumstances such as potential changes in the geometry of the vessel structures, lack of focus, and the presence of secular noise. Moreover, we also verified the effectiveness of each core modulus of multimodal images separately, by analyzing them individually against existing well established approaches. Also capable of aiding physicians and ophthalmologists under real circumstances, as raised by experienced specialists with good accuracy.

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