

# Fully Automated Hardware Based Clinical Decision Support System for the Automated Diagnoses Retinal Edema

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**Certificate**

We accept the work contained in this report as a confirmation to the required standard for the partial fulfillment of the degree of BS(EE).

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**Dedication**

*We dedicate this project work to our hardworking teachers and our beloved parents.*

## **Acknowledgements**

As a matter of first importance, we need to say thanks to Almighty ALLAH for enabling us to finish this undertaking. We might want to offer our thanks to our folks and our teachers for their understanding and direction.

**Abstract**

Human vision is formed at the innermost layer of eye called retina which contains light sensitive cells namely rods and cones to discriminate intensity and color information respectively. Retina is composed of many layers. Due to excessive hyperglycemia, fluid and protein deposits are accumulated within retinal layers. This accumulation causes the vision to become distorted and blurry. If these abnormalities are not identified in early stages, it leads to severe visual impairments or blindness. Optical coherence tomography (OCT) is the best and most widely used eye testing technique because of its ability to give accurate visualization of underlying pathology. Many researchers have worked on the automated detection of retinal diseases from OCT imagery but to the best of our knowledge, there is no hardware based clinical decision support system that can predict various pathological conditions of human retina. Therefore, we present a first ever hardware based hierarchical clinical decision support system that automatically screens healthy and diseased retinal OCT scans. The diseased scans are further diagnosed as retinal edema or central serous retinopathy positive based upon the type and morphology of the retinal fluid. The proposed system has been validated on random OCT scans which are publicly available online and produce the accuracy, sensitivity and specificity ratings of 85%, 80% and 90% respectively.

## **Table of Contents**

Certificate.....	i
Dedication.....	ii
Acknowledgements.....	iii
Abstract .....	iv
Table of Contents .....	v
List of Figures .....	viii
List of Tables .....	x
<b>Introduction .....</b>	<b>1</b>
1. Introduction .....	1
1.1 Project Overview .....	2
1.2 Motivation .....	3
1.3 Problem Description .....	3
1.4 Project Objectives and Scope .....	3
<b>Literature Review .....</b>	<b>4</b>
2.1 Background .....	5
2.2 Clinical and Technical Research .....	6
<b>Requirement Specifications.....</b>	<b>7</b>
3.1 Existing Technology .....	8
3.2 Proposed System .....	8
3.3 Requirement System .....	8
3.4 Requirement Description .....	9
<b>System Design .....</b>	<b>10</b>
4.1 Overall System design .....	11
4.1.1 phase-I .....	11
4.1.2 phase-II .....	11
4.2 Design Methodology .....	12
4.2.1 Steps of Fluid extraction.....	12

4.3 Design Constraints .....	12
<b>Implementation .....</b>	<b>13</b>
5.1 System implementation .....	14
5.1.1 Data Set Acquisition .....	14
5.1.2 Pre-processing .....	14
5.1.3 Extraction of useful layers.....	16
5.1.4 Classification based upon features .....	19
5.2 Hardware implementation .....	19
5.2.1 Open CV libraries .....	20
5.2.2 Numpy Libraries.....	20
5.3 Tools Used.....	20
5.3.1 Raspberry Pi 3 .....	20
<b>System Testing and Evaluation.....</b>	<b>22</b>
6.1 Results discussions .....	23
6.2 Results assessment .....	25
<b>Conclusion .....</b>	<b>30</b>
7.1 Conclusion of the report .....	31
7.2 Future recommendation.....	31
<b>References .....</b>	<b>31</b>

## List of Figures

Figure 1.1: Human Eye anatomy.....	1
Figure 1.2: OCT image of normal macula showing sub retinal layers.....	2
Figure 1.3: (a) Fundus image for the same patient(b) OCT image showing disease.....	2
Figure 2.1: Retinal diseases existing in a diabetic patient.....	5
Figure 2.2: Visual disorder of central vision leaving peripheral view unaffected in Macular Edema...	5
Figure 4.1: Block diagram of the overall project.....	11
Figure 5.1: Block diagram of the proposed methodology.....	14
Figure 5.2: OCT image showing contribution of each color.....	15
Figure 5.3: Filtered oct image.....	16
Figure 5.4: Binary image.....	17
Figure 5.5: Extracted ILM and Choroid Layers .....	17
Figure 5.6: Binary Mask.....	17
Figure 5.7: Fluid Pathology.....	18
Figure 5.8: Fluid Thickness.....	18
Figure 5.9: Results of healthy subjects.....	19
Figure 5.10: Results of ME pathology.....	19
Figure 5.11: Results of CSR pathology.....	19
Figure 5.12: Raspberry Pi 3.....	21
Figure 6.1: Bilateral Filter image in Python.....	25
Figure 6.2: 15x15 window size bilateral filter image.....	25
Figure 6.3: 35x35 window size bilateral filter.....	26
Figure 6.4: Fluid extraction in Python.....	26
Figure 6.5: Fluid extraction in MATLAB.....	27
Figure 6.6: Classification results on Raspberry Pi 3 Python window.....	27





## List of Tables

Table 6.1: Results applied on 25 Oct images data on Python.....	23
Table 6.2: Mean and Standard deviation of Fluid Thickness Profile .....	24
Table 6.3: Mean and Standard deviation of Area of Fluid.....	24
Table 6.4: Performance evaluation of the system in Raspberry Pi.....	28