IQ LEVEL ESTIMATION USING REGION GROWING METHOD

A PROJECT REPORT

Submitted by

SHIVANI R K 312315205145

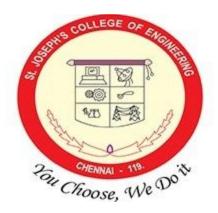
SONIYA S 312315205155

in partial fulfillment for the award of the degree of

BACHELOR OF TECHNOLOGY

in

INFORMATION TECHNOLOGY



St.JOSEPH'S COLLEGE OF ENGINEERING, CHENNAI 600119

ANNA UNIVERSITY: CHENNAI 600 025

MARCH 2019

ANNA UNIVERSITY: CHENNAI 600 025



BONAFIDE CERTIFICATE

Certified that this project report "IQ LEVEL ESTIMATION USING REGION **GROWING METHOD**" is the bonafide work of **SHIVANI R K (312315205145)** and SONIYA S (312315205155) who carried out the project work under my supervision, for the partial fulfillment of the requirements for the award of the degree of Bachelor of Technology in Information Technology.

SIGNATURE SIGNATURE

Dr. V.Muthulakshmi M.E., Ph.D., Associate Professor Assistant Professor

HEAD OF THE DEPARTMENT-LAB AFFAIRS

Department of Information Technology St. Joseph's College of Engineering Old Mamallapuram Road Chennai-600119

Mrs.P.Thilakavathy M.E.,

SUPERVISOR

Department of Information Technology St. Joseph's College of Engineering Old Mamallapuram Road Chennai-600119

Submitted for the Viva -Voce held on

(INTERNAL EXAMINER)

(EXTERNAL EXAMINER)

CERTIFICATE OF EVALUATION

College Name : St. Joseph's College of Engineering

Branch & Semester: Information Technology (VII)

S.NO	NAME OF THE	TITLE OF THE	NAME OF THE
	STUDENTS	PROJECT	SUPERVISOR WITH
			DESIGNATION
1.	SHIVANI R K	IQ LEVEL	Mrs.P.Thilakavathy
	(312315205145)	ESTIMATION	M.E.,
		USING REGION	
		GROWING	
2.	SONIYA S	METHOD	
	(312315205155)		

The report of the project work submitted by the above students in partial fulfillment for the award of Bachelor of Technology degree in Information Technology of Anna University were evaluated and confirmed to be reports of the work done by the above students.

(INTERNAL EXAMINER)

(EXTERNAL EXAMINER)

ACKNOWLEDGEMENT

The contentment and elation that accompany the successful completion of any work be incomplete without mentioning the people who made it possible.

We express our gratitude in thanking our Chairman Dr. B.Babu Manoharan M.A., M.B.A., Ph.D., our Managing Director Mrs. B.Jessie Priya M.Com., our Director Mr.B.Shashi Sekar M.Sc., our Principal Dr.Vaddi Seshagiri Rao M.E., M.B.A., Ph.D for having encouraged us to do our under graduation in Information Technology in this esteemed college.

We express our sincere thanks and most heartfelt sense of gratitude to our eminent Head of the Department-Lab Affairs **Dr. V.Muthulakshmi M.E., Ph.D.,** for having extended her helping hand at all times.

It is with deep sense of gratitude that we acknowledge our indebtedness to our supervisor **Mrs. P.Thilakavathy M.E.,** a perfectionist for her expert guidance and connoisseur suggestion.

Last but not the least, we thank our family members and friends who have been the greatest source of support to us.

ABSTRACT

Medical imaging is one of the rapid growing field. Till humankind exists, medical field analysis continues and dynamically adapting to great extent. Human Intelligence is based on physical and anatomical structure of the brain. The IQ level of an adult can be estimated using various parameters such as White matter, Grey matter, cortical thickness, parietal lobes and volume of the brain. The intelligence level of an individual varies mainly depending on the proportions of these parameters. The anatomical and functional data of the brain structure can be analysed using structural MRI.MRI of the brain is safe and painless test which uses magnetic field and radio waves to produce detailed images of the brain. Image segmentation is one of the most critical task in medical image analysis. The parameters such as white matter, grey matter and volume of the brain is used in measuring IQ level of an adult. Gray-scale image filter and median image filter are the preprocessing steps. Followed by region growing method which is used to segment white matter, grey matter and volume of the brain is identified using edge detection. Region growing segmentation is the pixel based analysis using initial seeded points.

TABLE OF CONTENTS

CHAPTER	TITLE	PAGE NO
	ABSTRACT	V
	LIST OF FIGURES	viii
	LIST OF TABLES	ix
1	INTRODUCTION	
	1.1 IMAGE PROCESSING	1
	1.2 SYSTEM OVERVIEW	2
	1.3 SCOPE OF THE PROJECT	2
2	LITERATURE SURVEY	3
3	SYSTEM ANALYSIS	
	3.1 EXISTING SYSTEM	
	3.1.1 Disadvantages of existing system	10
	3.2 PROPOSED SYSTEM	
	3.2.1 Advantages of proposed system	11
	3.3 REQUIREMENT SPECIFICATION	
	3.3.1 Hardware Requirements	12
	3.3.2 Software Requirements	12
	3.4 LANGUAGE SPECIFICATION	12
4	SYSTEM DESIGN	
	4.1 SYSTEM ARCHITECTURE	14
	4.2 SEQUENCE DIAGRAM	16

	4.3 USE CASE DIAGRAM	17	
	4.4 STATE DIAGRAM	18	
5	MODULE DESCRIPTION		
	5.1 MODULES	19	
	5.1.1 GRAY SCALE	20	
	5.1.2 MEDIAN FILTER	22	
	5.1.3 EDGE DETECTION ALGORITHM	25	
	5.1.4 REGION GROWING METHOD	27	
	5.1.5 IQ LEVEL ESTIMATION	32	
6	CONCLUSION AND FUTURE ENHANCEMENT		
	6.1 CONCLUSION	35	
	6.2 FUTURE ENHANCEMENT	35	
	APPENDIX 1	36	
	APPENDIX 2	41	
	REFERENCES	43	

LIST OF FIGURES

FIGURE NO	TITLE	PAGE NO
4.1	ARCHITECTURE OF PROPOSED SYSTEM	14
4.2	SEQUENCE DIAGRAM	16
4.3	USE CASE DIAGRAM	17
4.4	STATE DIAGRAM	18
5.1.1	GRAYSCALE IMAGE CONVERSION	20
5.1.2	IMAGE DENOISING	23
5.1.3	EDGE DETECTION ALGORITHM	26
5.1.3.1	IMAGE SEGMENTATION TECHNIQUES	28
5.1.3.2	PROPOSED REGION GROWING METHOD	29
5.1.3.3	REGION GROWING METHOD PROCEDURE	31
5.1.4	IQ SCORE DISTRIBUTION	32

LIST OF TABLES

TABLE NO	NAME OF THE TABLE	PAGE NO	
1	IQ Scale based on scores	33	
2	Statistics of Geniuses IQ scores	34	