



PROJECT REPORT
Detecting Jaundice with Image Processing

MARTIN BUDIANTO

17.K1.0017

Faculty of Computer Science
Soegijapranata Catholic University

2021

APPROVAL AND RATIFICATION PAGE

HALAMAN PENGESAHAN



Judul Tugas Akhir: : Detecting Jaundice with Image Processing
Diajukan oleh : Martin Budianto
NIM : 17.K1.0017
Tanggal disetujui : 07 Juli 2021
Telah setuju oleh
Pembimbing : R. Setiawan Aji Nugroho S.T., MCompIT., Ph.D
Penguji 1 : R. Setiawan Aji Nugroho S.T., MCompIT., Ph.D
Penguji 2 : Rosita Herawati S.T., M.I.T.
Penguji 3 : Hironimus Leong S.Kom., M.Kom.
Penguji 4 : Y.b. Dwi Setianto
Penguji 5 : Yulianto Tejo Putranto S.T., M.T.
Ketua Program Studi : Rosita Herawati S.T., M.I.T.
Dekan : R. Setiawan Aji Nugroho S.T., MCompIT., Ph.D

Halaman ini merupakan halaman yang sah dan dapat diverifikasi melalui alamat di bawah ini.

sintak.unika.ac.id/skripsi/verifikasi/?id=17.K1.0017

STATEMENT OF ORIGINALITY

I, the undersigned:

Name : MARTIN BUDIANTO

ID : 17.K1.0017

Certify that this project was made by myself and not copy or plagiarize from other people, except that in writing expressed to the other article. If it is proven that this project was plagiarizes or copy the other, I am ready to accept a sanction.



Semarang, July, 7, 2021



MARTIN BUDIANTO

17.K1.0017

**APPROVAL PAGE FOR PUBLICATION OF
SCIENTIFIC PAPERS FOR ACADEMIC INTEREST**

The undersigned below :

Name : Martin Budianto
Undergraduate Program : TECHNICAL INFORMATION
Faculty : COMPUTER SCIENCE
Type of work : SKRIPSI

Approved to give Non-Exclusive Royalty Free Right to Soegijapranata Catholic University Semarang for scientific work entitled “Detecting Jaundice with Image Processing” along with the existing tools (if needed). With this Non-Exclusive Royalty Free Right Soegijapranata Catholic University has the right store, transfer data / format, manage in the form of database, maintain and publish this final project as long as I keep my name as a writer / creator and as a Copyright owner.

This statement I made in truth

Semarang, July 7, 2021

Sincerely


MARTIN BUDIANTO

ACKNOWLEDGEMENTS

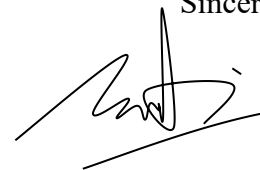
First of all, thank you to God Jesus Christ for His blessing, so that I can finish my final project successfully. The final project is a requirement to take a the Bachelor of Computer Science Exam in the Informatic Engineering Study Program at Soegijapranata Catholic University Semarang

In the preparation and masking of this final project, I was always supported and encouraged by people around me, special thanks to :

1. Mother, Brother, Aunt, Uncle and my family who always support me and wishing me the best for my final project
2. R. Setiawan Aji Nugroho S.T., MCompIT., Ph.D as a Supervising Lecturer who has kindly provided guidance and believe in me, so that my final project can be completed properly
3. My friends from icikiwir group and Soegijapranata Catholic University who always supported me and believe in me to finish my final project
4. And other person that I can not mention one by one who pray for me and support me while working this project

Semarang, July 7, 2021

Sincerely



MARTIN BUDIANTO

ABSTRACT

This research was conducted for how to detect jaundice using image processing, where Jaundice is a condition in which the skin, sclera (whites of the eyes) and mucous membranes turn yellow because of high bilirubin. Because if jaundice is not detected quickly it will cause kernicterus and can also cause death, My proposed method to solve this problem is by using color detection algorithm to my program with using HSV color space and kernel method as classification, while the only existing project is made by Ashish Sardana, in overcoming jaundice by using his proposed method using the YCbCR color space and Logistic regression as the classification method, where my program has an average success rate of 90% and Ashish Sardana's program is below 50% which was tested with the same 100 datasets because Ashish Sardana program failed to find right value of yellow jaundice color,so the result of his program failed to differentiate between negative or positive data.

Keyword:Jaundice,Image Processing,Color Detection,Convolution Kernel,HSV Color Space

TABLE OF CONTENTS

Cover.....	i
APPROVAL AND RATIFICATION PAGE.....	ii
STATEMENT OF ORIGINALITY.....	iii
APPROVAL PAGE FOR PUBLICATION OF.....	iv
SCIENTIFIC PAPERS FOR ACADEMIC INTEREST.....	iv
ACKNOWLEDGEMENTS.....	v
ABSTRACT.....	vi
TABLE OF CONTENTS.....	vii
ILLUSTRATION INDEX.....	viii
INDEX OF TABLES.....	ix
CHAPTER 1 Introduction.....	1
1.1 Background.....	1
1.2 Problem Formulation.....	2
1.3 Scope.....	2
1.4 Objective.....	2
CHAPTER 2 Literature Study.....	3
CHAPTER 3 Research Methodology.....	12
CHAPTER 4 Analysis and Design.....	14
4.1 Analysis.....	14
4.2 Desain.....	15
CHAPTER 5	22
IMPLEMENTATION AND TESTING.....	22
5.1 Implementation.....	22
5.2 Testing.....	26
5.3 Comparison with existing project.....	32
CHAPTER 6 Conclusion.....	34
References.....	32
Appendix.....	33

ILLUSTRATION INDEX

Figure 2.1: Flowchart Watershed algorithm.....	5
Figure 2.2: Normalize RGB method.....	6
Figure 2.3: RGB to HSV method.....	6
Figure 2.4: RGB to YCbCr method.....	7
Figure 2.5: Flowchart Face detection Algorithm.....	8
Figure 2.6: RGB to HSV method by Khamar Basha Shaika.....	9
Figure 2.7: How Kernel Method work.....	9
Figure 2.8: Flowchart of Regularized Kernel Based Fuzzy Algorithm.....	10
Figure 4.1: Flowchart Color Detection.....	15
Figure 4.2: Positive Dataset	16
Figure 4.3: Result of RGB to HSV.....	16
Figure 4.4: Result from get value color.....	17
Figure 4.5: Final Result	17
Figure 4.6: Negative Dataset.....	18
Figure 4.7: Result HSV of Negative Dataset	18
Figure 4.8: Kernel Method	20
Figure 4.9: Convolution Kernel.....	21
Figure 5.0: Matrix Sharpening	21
Figure 5.1: Flowchart Proposed algorithm by Ashish Sardana	32

INDEX OF TABLES

Table 5.1: Table Positive and Negative class.....	26
Table 5.2: Table Result Positive and Negative class.....	26
Table 5.3: Table Result of F Measures.....	28
Table 5.4: Table Average by age.....	28
Table 5.5: Table Average by race.....	29
Table 5.6: Table Sensitivity and Specificity.....	30
Table 5.7: Graph Sensitivity and Specificity.....	30
Table 5.8: Table Result of positive and Negative prediction existing project	26
Table 5.9: Table Result Fmeasure of existing project.....	27

