DETECTION AND CLASSIFICATION OF NON-PROLIFERATIVE DIABETIC RETINOPATHY STAGES USING SUPPORT VECTOR MACHINE (SVM) AND ARTIFICIAL NEURAL NETWORK(ANN)

UNDERGRADUATE THESIS

UNIVERSITAS BAKRIE

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INFORMATICS STUDY PROGRAM

FACULTY OF ENGINEERING AND COMPUTER SCIENCE

UNIVERSITAS BAKRIE

JAKARTA

2016

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As a partial fulfillment of the requirements for Undergraduate Degree in Informatics at Universitas Bakrie

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STATEMENT OF ORIGINALITY

This undergraduate thesis is my original work and all information contained in this project paper which is derived from the work of others had been given an award by citing the name of the sources author correctly. All the contents of this undergraduate thesis are the responsibility of the author thoroughly.

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ACKNOWLEDGMENT

Praise be Allah SWT, the Merciful and Gracious, thesis with the title "Detection and Classification of Non-proliferative Diabetic Retinopathy Stages using Support Vector Machine(SVM) and Artificial Neural Network(ANN)" as a graduation condition of undergraduate thesis can be completed. This thesis is submitted as the partial fulfillment of the requirements for the Undergraduate Degree of Informatics at Universitas Bakrie.

There are many people who have helped the author in the research and writing of this final project, either in the form of guidance, advice, and support morally and materially. Therefore, at this moment I would like to express my gratitude and highest appreciation to::

1. Mr. Prof Dr. Hoga Saragih, ST, MT as the Head of Informatics Program Study who always supports, guides and gives his time during thesis progress. He always cheers and calms the author whenever the author faces obstacles and difficulties.

2. Mr. Irwan Prasetya Gunawan, ST, MEng, PhD for his guidance and support during thesis preliminary defense. He was kind enough for supporting me and being cooperative so that I held my preliminary thesis preparation for around two months. He also still guides me until thesis defense

3. Mr. Yusuf Lestanto, ST.,M.Sc. as preliminary thesis examiner who provide advice and improvements to this research.

4. Mr. Berkah I.Santoso who provides advice, suggestion and support in order to continue thesis with the same topic. He has been kind and given the easy guidance during thesis defense.

5. Mr. Iwan Adichandra, MIEE, MIET, MBCS who downloaded thesis papers and gave the accessible link for me to download journal paper for free.

6. My biggest gratitude to my parents for their countless supports and tons of prays. I would never thank them enough. I would also like to thank both my sister Hamidatul Khalifah and my brother Ahlan Firdaus for their supports and prays. Especially for Ahlan who always cheers me up and tells me some jokes. I love them hard.

7. My special thanks to Tessa Hendria Kartika and Mega Silvia Fahriani for the constant reminder in finishing thesis as soon as possible and listening to my tough times related to my thesis.

8. My sincere gratitude to Clarissa Philana Sophia Azaria for all related ebooks about Matlab and her kindness.

9. Last but not least, I would like to extend my gratitude to Ana Ainul Syamsi, Adlan Qowi, Faiz Faidurrahman and Fauzan Al Agung. Ana has given me supports and suggestions during thesis consultation. She also accompanied me working on my thesis. Adlan has offered me help upon my thesis completion. Faiz and Ucang who helped and gave me thesis writing example to follow. You guys rock!

The author believes that this thesis is far from perfect. Therefore, the improvement and further research is still needed. Nevertheless, hopefully this thesis is useful for researchers and others in need.

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Detection and Classification of Non-proliferative Diabetic Retinopathy Stages Using Support Vector Machine(SVM) and Artificial Neural Network(ANN)

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Abstract

Diabetic Retinopathy is the damage of blood vessels which can cause blindness. The detection of diabetic retinopathy is usually carried out by ophthalmologist by analysing fundus photography. In order to get accurate result, the fundus photography can be graded by up to four different ophthalmologists. This standard is highly impossible to achieve in rural areas with the shortage of qualified medical ophthalmologists. Therefore, an automated detection of diabetic retinopathy will be needed in order to ease the burden of ophthalmologist. Furthermore, it can also be used as training module for retinal screeners and graders. This research provides an automated detection and classification of non-proliferative diabetic retinopathy(NPDR). More specifically, this research uses Support Vector Machine(SVM) and Artificial Neural Network(ANN). The classification of diabetic retinopathy is grouped into the respective stage of non-proliferative diabetic retinopathy: normal (No DR detected), mild, and severe.

Keywords : Non-proliferative Diabetic Retinopathy(NPDR), Support Vector Machine(SVM), Artificial Neural Network(ANN), ophthalmologist

Contents

1 Introduction **1**

1.1 Background . . . 1

1.2 Research Questions . . . 2

1.3 Scope of Research . . . 2

1.4 The objective and Benefit of Research . . . 2

1.4.1 Objective of Research . . . 2

1.4.2 Benefit of Research . . . 3

1.5 Contribution of Research . . . 3

2 Literature Review **4**

2.1 Related Works . . . 4

2.2 Diabetic Retinopathy . . . 7

2.3 Diabetic Retinopathy Screening . . . 8

2.4 Pre-processing . . . 8

2.4.1 Greyscale Conversion . . . 9

2.4.2 Histogram Equalization . . . 9

2.4.3 Masking . . . 10

2.4.4 Multiresolution Analysis . . . 10

2.5 Image Segmentation . . . 18

2.5.1 Segmentation Algorithm . . . 18

2.5.2 Mathematical Morphology . . . 20

2.5.3 Hough Transform . . . 21

2.6 Feature Extraction . . . 22

2.6.1 Texture Features . . . 22

2.6.2 Geometric Features . . . 25

2.7 Classification Algorithm . . . 26

2.7.1 Support Vector Machine (SVM) . . . 26

2.7.2 Artificial Neural Network(ANN) . . . 27

3 Research Design and Methodology **28**

3.1 The General Design of System . . . 28

3.1.1 Research Materials . . . 28
3.1.2 Datasets . . . 28
3.2 Research Schedule . . . 29

4 Research Implementation **33**
4.1 Pre-processing . . . 33
4.1.1 Color Conversion . . . 33
4.1.2 Shade Correction . . . 33
4.2 Segmentation . . . 34
4.2.1 Blood Vessels Detection . . . 35
4.2.2 Microaneurysms . . . 35
4.2.3 Hemorrhages . . . 42
4.2.4 Optic Disc(OD) Detection . . . 46
4.2.5 Exudates . . . 49
4.3 Feature Extraction . . . 51
4.3.1 Geometric Features . . . 52
4.3.2 Gray Level Co-occurrence Matrix(GLCM) . . . 52
4.3.3 Feature Extraction of Diabetic Retinopathy . . . 53
4.4 Classification . . . 53
4.4.1 Support Vector Machine(SVM) . . . 55
4.4.2 Artificial Neural Network(ANN) . . . 55
4.4.3 Discussion . . . 56

5 Conclusion and Recommendation **59**
5.1 Conclusion . . . 59
5.2 Implication and Recommendations . . . 59

List of Tables

2.1 Diabetic Retinopathy Grading [38] 8
2.2 1st level of decomposition 17
2.3 2nd level of decomposition 17
2.4 3rd level of decomposition 17

3.1 Table of Research Schedule 32

4.1 Comparative Results for Precise(pixel-level) Exudate Detection 51
4.2 Diabetic Retinopathy Grading [38] 54
4.3 Table of Comparison for Classification Result 56

List of Figures

2.1 Retinal fundus images of (a)Normal (b)NPDR (c)PDR 7
2.2 The structure of pyramidal image 12
2.3 A diagram to construct two close related image pyramids. 12
2.4 An approximation pyramid 14
2.5 A prediction residual pyramid 14
2.6 A four-band split of the vase using the subband coding system. 15
2.7 A prediction residual pyramid 15
2.8 The process of getting GLCM 23
2.9 Support Vector Machine (SVM) [61] 26

3.1 Data Training 30
3.2 Data Testing 31

4.1 Image with vignetting effect [36] 34
4.2 (a)Original RGB image (b)Green Channel Image (c) Shade Correction 34
4.3 Results(left to right) of (a)Pre-processing (b)CLAHE (c)Intensity Adjustment 35
4.4 Results(left to right) of (d)Filter Frangi (e)Thresholding (f)Opening 36
4.5 Microaneurysms 36
4.6 Results(left to right) of (a)Green Channel (b)CLAHE 37
4.7 Results(left to right) of Img1, Img2, Img3 37
4.8 Image Img4 38
4.9 Illustration of microaneurysm detection (a) Input image. (b) After column filtering. (c) Region of exudates without optic disk. 39
4.10 Illustration of microaneurysm detection (d) Final MAs. 39
4.11 Image (a). Green Channel Image (b)Shade Correction (c)CLAHE 40
4.12 Image (d)Canny Edge Detection (e)Region Filling (f)Image subtraction(d-e) 40
4.13 Image (g)Outer Circle (h)Image subtraction(f-g) (i)OD removal image 40
4.14 Image (j)Noise elimination (k)Exudates removal (l)Final result 41
4.15 Hemorrhages and Macula [55] 42
4.16 (a)Original RGB image (b)Green Channel Image (c) Shade Correction 44
4.17 Results(left to right) Image (d)CLAHE (e)Median Filter (f)Image subtraction(d-e) . . 44

4.18 Results(left to right) Image (g)Median Filter to eliminate Noise (h)K-Means Segmentation (i)Thresholding Segmentation 44
4.19 Results(left to right) Image (j)Blood Vessels Detection (k)Image subtraction(h-j) (l)Image subtraction(i-j) 45
4.20 Results(left to right) Image (m)Image Reconstruction (n)Non-hemorrhages removal using Regionprop (o)Elimination of non-hemorrhages which are around 50px 45
4.21 Macula Removal 45
4.22 The hemorrhages ground truth in DiaretDB1 46
4.23 Optic Disc(OD) 47
4.24 Image (a)Red Channel Image (b) Wavelet Image 47
4.26 Results(left to right) Image (a) Gaussian (b) Canny Edge Detection (c) Outer Edge (d)The result of image (b)-(c) 48
4.27 Optic Disc detection 49
4.28 Exudates [51] 49
4.29 Results(left to right) Image (a)Pre-processing (b)Median Filter (c)Image subtraction(a-b) 50
4.30 Results(left to right) Image (a)Thresholding (b)Noise Elimination (c)Image subtraction(d-e) 50
4.31 Results(left to right) Image (g)Outer/Border Image (h)Image subtraction(f-g) (i)Regionprops Elimination such as circularities and eccentricity 51
4.32 A flowchart of Feature Extraction Stage 53
4.33 Diagram of Testing 54
4.34 ANN Tool 55

List of Attachments

LAMPIRAN 1 Matlab Source Code

LAMPIRAN 2 Comparison Table of Microaneurysms Segmentation Algorithm

LAMPIRAN 3 Table of Microaneurysms Segmentation Evaluation

LAMPIRAN 4 Table of Hemorrhages Segmentation Evaluation

LAMPIRAN 5 Table of Optic Disc Detection Evaluation

LAMPIRAN 6 Table of Exudates Segmentation Evaluation

List of Abbreviations

SVM	Support Vector Machine
DR	Diabetic Retinopathy
NPDR	Non-proliferative Diabetic Retinopathy
PDR	Proliferative Diabetic Retinopathy
NN	Neural Network
ANN	Artificial Neural Network
OAA	One Against All
OAO	One Against One