DEVELOPING A FINGER-VEIN CAPTURING DEVICE

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Fakulti Kejuruteraan Elektronik dan Kejuruteraan Komputer

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This thesis is dedicated to my father, who taught me that the best kind of knowledge to have is that which is learned for its own sake. It is likewise dedicated to my mother, who taught me that even the largest task can be achieved if it is executed one step at a time.

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ABSTRAK

Projek ini adalah untuk membina satu model "Peranti Penangkap Corak Saluran Darah Jari". Peranti ini adalah satu alat yang akan menangkap imej saluran darah jari manusia dan akan digunakan untuk tujuan keselamatan biometrik, contohnya untuk tujuan pengesahan, pengiktirafaan, dan juga pengambilalihan. Cahaya berhampiran inframerah, *Near Infrared* (NIR) akan dikeluarkan oleh satu bank NIR LED menumbusi jari dan diserapkan oleh hemogoblin dalam darah kita. Kawasan-kawasan di mana sinar NIR diserap, iaitu saluran darah jari akan muncul sebagai kawasan gelap dalam imej yang ditangkap oleh kamera CCD yang terletak di sebelah yang bertentangan dengan jari. Imej yang telah ditangkap akan diproses serta dianalisis untuk tujuan keselamatan biometrik pada masa akan dating.

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ABSTRACT

The project is focusing on developing a finger-vein capturing device. It is a device that will capture the human finger vein image and will be used for biometric security purposes such as authentication, verification and identification. A near-infrared light (NIR) will be emitted by a bank of NIR Light Emitting Diodes (LEDs) which will penetrate the finger and are absorbed by the haemoglobin in the blood. The areas in which the NIR rays are absorbed (i.e. Veins) thus appear as dark regions in an image conveyed by a CCD camera located on the opposite side of the finger. The image captured is analysed by using Mean Square Error (MSE) and Peak Signal-to-Noise Ratio (PSNR) to set the suitable potentiometer level and to find determine the best finger-vein image.

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TABLE OF CONTENTS

CHAPTER	CONTENTS	PAGES
	PROJECT TITLE	i
	CONFIRMATION REPORT STATUS	ii
	RECOGNITION	iii
	SUPERVISOR AFFIRMATION	iv
	DEDICATION	v
	ACKNOWLEDGEMENT	vi
	ABSTRAK	vii
	ABSTRACT	viii
	TABLE OF CONTENTS	ix – xvii
	LIST OF TABLES	xviii
	LIST OF PICTURES	xix - xxiv
	LIST OF SHORT FORMS	xxv

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CHAPTER	CONTENTS	PAGES
I	INTRODUCTION	1 - 4
	1.1 Project Introduction	1 - 2
	1.2 Project Objectives	2
	1.3 Problem Statements	3
	1.4 Scopes of Works	4
II	LITERATURE REVIEWS	6 - 19
	2.1 Theory of Biometrics	6 - 7
	2.2 Theory of Finger-vein Biometrics	7
	2.3 Features and Comparisons between Finger-vein	8
	2.3.1 Resistant to Criminal Tampering	8
	2.3.2 High Accuracy	8
	2.3.3 Unique and Constant	9
	2.3.4 Contactless	9
	2.3.5 Ease of Feature Extraction	9
	2.3.6 Fast Authentication Speed	9
	2.3.7 Disadvantages of other Biometrics Traits	10
	2.4 Types of Sensors being Used in Camera	11 - 12
	2.4.1 Charge-coupled Device (CCD) Image Sensor	11 - 12
	2.4.2 Complementary Metal-oxide Semiconductor (CMOS) Image Sensor	12
	2.5 Finger-vein Pattern Imaging Methods	
	2.5.1 Light Reflection Method	13 - 14
	2.5.2 Light Transmission Method	15
	2.6 Mean Square Error (MSE) and Peak Signal-to-Noise Ratio (PSNR)	16
	2.7 Summary of Previous Studies	17 – 19

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	2.8 Summary	19
III	METHODOLOGY	20 - 38
	3.1 Introduction	20
	3.2 Methodology	29 - 34
	3.2.1 Finger Vein Pattern Imaging Methods	21 - 22
	3.2.2 Building the Finger Vein Capturing Device's Prototype	23 - 30
	3.2.2.1 NIR Illuminating Circuit Design and Simulation	24
	3.2.2.2 NIR Illuminating Circuit Construction and Testing on Breadboard	25
	3.2.2.3 NIR Illuminating Circuit Etching and Soldering	26
	3.2.2.4 Modification of Suitable CCD Webcams	27 - 29
	3.2.2.5 Evaluating and Initial Capture of a Finger-vein Image	30
	3.2.3 Developing the Finger-vein Image Analysis Methods	31 - 32
	3.2.3.1 Determine the Standard Finger-vein Image	32
	3.2.3.2 Determine the Best Finger-vein Image	32
	3.2.4 Developing the Finger-vein Capturing Device's GUI	33 - 35
	3.2.5 Correct Methods in Using Finger-vein Capturing Device	36 - 37
	3.2.6 Analysing and Collecting Results	38
	3.2.7 Testing and Troubleshooting	38

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	3.2.8 Report Writing	38
IV	RESULTS, ANALYSIS AND DISCUSSIONS	39 – 104
	4.1 Simulation of NIR Illuminating Circuit	39 - 41
	4.2 NIR Circuit Construction and Testing on Breadboard	42 - 43 38 - 40
	4.3 Results	44
	4.3.1 Documentation of The Finger-vein Capturing Device's Prototype being Built	44 - 56
	4.3.1.1 The Circuit was Constructed in Proteus ISIS	45
	4.3.1.2 The ISIS Circuit Drawing was then Converted to ARES and Rerouted	46
	4.3.1.3 The Sensonic Webcam 8000 was Scattered	47
	4.3.1.4 The Lens was Detached from the CCD Sensor	48
	4.3.1.5 The IR Filter was Detached from the Lens	49
	4.3.1.6 The Lens was Mount Back to the CCD Sensor	50
	4.3.1.7 The Electronic Components were Soldered on to the Circuit Board	51
	4.3.1.8 The Black Exposed Film was Glued to Cover the Webcam	52
	4.3.1.9 The Body of the Prototype was Built	53 - 54
	4.3.1.10 Sponge and Transparent Plastic Paper were Added to the Finger Placement Section	55

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4.3.1.11 The Potentiometer's Level as well as the Switch were Labelled 55
4.3.1.12 Final Product or Prototype 56
4.3.2 Development of the GUI for the Finger-vein Capturing Device by Using MATLAB 57 - 64
4.3.2.1 The GUI Layout for the Finger-vein Capturing Device was Designed 57 - 58
4.3.2.2 The Finger-vein Capturing Device Prototype's Webcam was Configured 58 - 59
4.3.2.3 The Configure Webcam was Previewed in the GUI 60
4.2.3.4 The Finger-vein Images was Captured 61
4.2.3.5 The Finger-vein Images were Saved to the Particular Directories 62
4.2.3.6 The Standard Finger-vein Image from "Capture" Directory was Determined 63
4.2.3.7 The Best Finger-vein Images from the "Database" Directory was Determined 64
4.3.3 Steps in Using Finger-vein Capturing Device and Its GUI 65 - 83
4.3.3.1 The Finger-vein Capturing Device's Prototype was Connected to the Computer via USB Port 65
4.3.3.2 The GUI Named "FingerVeinCapture_GUI" was Run from MATLAB 66
4.3.3.3 The Correct Video Input Device was Selected 67
67

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4.3.3.4 The Finger-vein Capturing Device ID was Selected 68
4.3.3.5 The Suitable Video Format and Resolution was Selected 69 - 70
4.3.3.6 User's Finger was Placed into the Prototype 71
4.3.3.7 The Finger-vein Image was Previewed from the GUI 72
4.3.3.8 The Finger-vein Image was Captured 73
4.3.3.9 The Captured Finger-vein Image was Saved 74 - 77
4.3.3.10 Total of First 10 Finger-vein Images of Different Brightness were Captured and Saved 78
4.3.3.11 The Standard Finger-vein Image is Determined 79 - 82
4.3.3.12 Total of Second 10 Finger-vein Images Based on Standard Potentiometer Level are Captured and Saved 82 - 83
4.3.3.13 The Best Finger-vein Image is Determined 84 - 104
4.4 Finger-vein Images Analysis 85 - 93
4.4.1 Find the Standard Finger-vein Images 85
4.4.1.1 User was Required to Enter the User Number 86
4.4.1.2 The First Ten Captured Finger-vein Images from "Capture" folder was Read into MATLAB 87
4.4.1.3 The Finger-vein Images were Cropped 88

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4.4.1.4 The Finger-vein Images were Converted to Type Double 89
4.4.1.5 The Finger-vein Images' Channel were Reduced from RGB to Grayscale 89
4.4.1.6 The Mean Value among the First Ten Finger-vein Images was Determined 90
4.4.1.7 The MSE of the Ten Captured Finger-vein Images to the Mean Value were Determined 91
4.4.1.8 The PSNR of the First Ten Captured Finger Vein Images were Determined 92
4.4.1.9 The Minimum MSE and Maximum PSNR were Determined
4.4.1.10 The User Number, Minimum MSE and Maximum PSNR were Displayed 92
4.4.1.11 The Standard Finger-vein Image was Determined based on the Mean Value 93
4.4.2 Find the Best Finger Vein Images 94 - 104
4.4.2.1 The Command Window was Cleared and Global Variables were Declared 94
4.4.2.2 The Other Ten Captured Finger-vein Images from "Database" folder was Read into MATLAB 95
4.4.2.3 The Finger-vein Images were Cropped 96
4.4.2.4 The Finger-vein Images were Converted to Type Double 97

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	4.4.2.5 The Finger-vein Images' Channel were Reduced from RGB to Grayscale	98
	4.4.2.6 The MSE of the Secondly Captured Ten Finger-vein Images to the Standard Image were Determined	99
	4.4.2.7 The PSNR of the Secondly Captured Ten Finger Vein Images were Determined	100
	4.4.2.8 The Minimum MSE and Maximum PSNR were Determined	101
	4.4.2.9 The User Number, Minimum MSE and Maximum PSNR were Displayed	101
	4.4.2.10 The Best Finger-vein Image was Determined	102
	4.4.2.11 Normalized Histograms were Calculated for Both Standard Image and Best Image	103
	4.4.2.12 The Standard Finger-vein Image and the Best Finger-vein Image Together with Their Histograms were Displayed	103 - 104
V	CONCLUSIONS	105 - 107
	5.1 Conclusions	105 - 106
	5.2 Novelty and Inventiveness	106
	5.3 Future Recommendation	106
	5.4 Potential of Commercialization	107

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CHAPTER	CONTENTS	PAGES
	REFERENCES	108 - 110
	APPENDIX	111 - 128
	APPENDIX A	111 - 113
	APPENDIX B	114 - 124
	APPENDIX C	125 - 126
	APPENDIX D	127 - 128

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LIST OF TABLES

No.	Title	Pages
2.1	Comparisons of Five Major Biometrics Methods	10
2.2	Comparisons of Previous Studies in terms of Methods Used, Strengths, and Weaknesses	17 - 19
3.1	Comparison between Shortlisted Webcams	27
4.1	First 10 Captured Finger Images with 10 Different Potentiometer Levels of User 1	75 - 77
4.2	Database Finger-vein Images with Same Potentiometer Levels of User 1	79 - 82
4.3	MSE Values for Each Firstly 10 “Capture” Finger Vein Images of User 1	90
4.4	PSNR Values for Each Firstly 10 “Capture” Finger Vein Images of User 1	91
4.5	MSE Values for Each 10 “Database” Finger-vein Images of User 1	99
4.6	PSNR Values for Each 10 “Database” Finger Vein Images of User 1	100

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LIST OF PICTURES

No.	Title	Pages
2.1	CCD and CMOS image sensors Convert Light into Electrons	11
2.2	Light Reflection Method	14
2.3	Light Transmission Method	15
3.1	Light Transmission Method	22
3.2	Flow Chart in Building the Finger-vein Capturing Device Prototype	23
3.3	NIR Illuminating Circuit Design and Simulation	24
3.4	NIR Illuminating Circuit Construction and Testing on Breadboard	25
3.5	NIR Illuminating Circuit after Etching and Soldering	26
3.6	Sensonic Webcam 8000	28
3.7	IR Filter is removed from the Lens of Sensonic Webcam 8000	29
3.8	Finger-vein Image is captured before Building Prototype	30
3.9	Flow Chart in Developing the Finger-vein Image Analysis Methods	31
3.10	Flow Chart in Developing the Finger-vein Capturing Device's GUI	33

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3.11	Finger-vein Capturing Device GUI Design in "guide" MATLAB	34
3.12	Correct Methods in Using Finger-vein Capturing Device	36
4.1	Simulation with Multisim (0% Potentiometer)	40
4.2	Simulation with Multisim (50% Potentiometer)	40
4.3	Simulation with Multisim (100% Potentiometer)	41
4.4	Dim IR LEDs Brightness due to 0% Potentiometer	42
4.5	Normal IR LED Brightness due to 50% Potentiometer	43
4.6	High IR LED Brightness due to 100% Potentiometer	43
4.7	NIR Illuminating Circuit Design and Simulation in Proteus ISIS	45
4.8	NIR Illuminating Circuit PCB Design in ARES (Controller Circuit)	46
4.9	NIR Illuminating Circuit PCB Design in ARES (NIR LEDs Circuit)	46
4.10	The Sensonic Webcam 8000 is Scattered Apart	47
4.11	The Lens is detached from the CCD Sensor's Housing	48
4.12	The IR Filter is removed from the Lens	49
4.13	The Lens is mounted back to the CCD Sensor's Housing	50
4.14	NIR Illuminating PCB Board for both Controller and LEDs Circuits	51
4.15	An Exposed Black Film is attached to the Sensonic Webcam 8000	52
4.16	NIR Illuminating Circuit being Mounted and Arranged in a Box placed on top of the Prototype's Body	54
4.17	Body of the Finger-vein Capturing Device's Prototype	54

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4.18	The Switch and Potentiometer are labelled	55
4.19	Finger-vein Capturing Device Prototype	56
4.20	Layout of FingerVeinCapture_GUI.fig	58
4.21	Codes for button “Configure Cam”	59
4.22	Codes of button “Preview”	60
4.23	Codes of button “Capture Image”	61
4.24	Code of button “Save As”	62
4.25	Codes of button “Analyse Images”	63
4.26	Codes of button “Find Best Image”	64
4.27	USB Connection between Finger-vein Capturing Device Prototype & Computer	65
4.28	FingerVeinCapture_GUI	66
4.29	Video Input Device Selection	67
4.30	Device ID Selection	67
4.31	Video Format & Resolution Selection	68
4.32	The Potentiometer Level was adjusted to Level 1 and Switch was turned OFF	69
4.33	Proper Placement of Finger into the Prototype	70
4.34	Finger-vein Image was Previewed Live from the Prototype in the GUI	71
4.35	Finger-vein Image Captured and Previewed in GUI	72
4.36	The Captured Finger-vein Images of User 1 are saved	73
4.37	Cap_User_1_1.jpg	75
4.38	Cap_User_1_2.jpg	75
4.39	Cap_User_1_3.jpg	75
4.40	Cap_User_1_4.jpg	76
4.41	Cap_User_1_5.jpg	76
4.42	Cap_User_1_6.jpg	76
4.43	Cap_User_1_7.jpg	76
4.44	Cap_User_1_8.jpg	77
4.45	Cap_User_1_9.jpg	77
4.46	Cap_User_1_10.jpg	77

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4.47	The Standard Finger-vein Image of User 1 was Determined	78
4.48	4.48: DB_User_1_1.jpg	79
4.49	DB_User_1_2.jpg	80
4.50	DB_User_1_3.jpg	80
4.51	DB_User_1_4.jpg	80
4.52	DB_User_1_5.jpg	80
4.53	DB_User_1_6.jpg	81
4.54	DB_User_1_7.jpg	81
4.55	DB_User_1_8.jpg	81
4.56	DB_User_1_9.jpg	81
4.57	DB_User_1_10.jpg	82
4.58	The Best Finger-vein Image was Determined for User 1	83
4.59	Cropped Finger-vein Image and Histograms of the Standard Image and Best Image of User 1	83
4.60	Dialog Box was popped out Asking User to Enter the User Number	85
4.61	The First 10 Captured Finger-vein Images from User were Read from “Capture” Folder	86
4.62	The First 10 Finger-vein Images are cropped after being Read	87
4.63	The First 10 Cropped Finger-vein Images were converted to Type Double	88
4.64	The First 10 Images were reduced Channel from RGB to Grayscale after being converted to Type Double	89
4.65	The Mean Value is determined among the First 10 Finger Vein Images	89
4.66	The MSE for each of the Firstly Captured Ten Finger-vein Images to the Mean Value were determined	90

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4.67	The PSNR for each Firstly Captured Ten Finger-vein Images were determined	91
4.68	The Minimum MSE and Maximum PSNR were determined	92
4.69	Displaying the User Number, Min MSE and Max PSNR	92
4.70	Standard Image of User 1 was determined	93
4.71	Results in GUI Showing which User, Min MSE, MAX PSNR and finally Standard Finger-vein Image	93
4.72	Command Window was cleared & Global Variables were declared	94
4.73	Secondly 10 Captured Finger-vein Images from User in “Database” Folder was read into MATLAB	95
4.74	The Secondly Captured 10 Finger-vein Images were cropped	96
4.75	The Secondly Captured 10 Cropped Finger Vein Images were converted to Type Double	97
4.76	The Secondly Captured 10 Images were reduced Channel from RGB to Grayscale	98
4.77	The MSE for each Secondly Captured Ten Finger Vein Images to the Standard Finger-vein Image were determined	99
4.78	The PSNR for each Secondly Captured Ten Finger Vein Images to the Standard Finger-vein Image were determined	100
4.79	The Min MSE and Max PSNR for "Database" Finger Vein Images of User 1	101
4.80	Results Showing User Number, Min MSE and Max PSNR of “Database” Finger Vein Images of User 1	101
4.81	Best Finger-vein Image of User 1 was determined	102
4.82	Results in GUI Showing which User, Min MSE, MAX PSNR and finally Best Finger-vein Image	102

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4.83	Image and Best Normalized Histogram for Standard Image	103
4.84	Function in MATLAB to Calculate and Display the Normalized Histogram of The Standard Finger-vein Image and the Best Finger-vein Image	104
4.85	The Standard Finger-vein Image and the Best Finger-vein Image Together with Their Histograms are displayed	104

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