

**DEVELOPMENT OF THUMBPRINT RECOGNITION
SYSTEM USING MATLAB**

This report is presented in partial fulfillment for the award of the

**Bachelor of Electrical Engineering (Hons)
UNIVERSITI TEKNOLOGI MARA**



**WAN HASNIZAM BIN WAN HASSAN
Faculty of Electrical Engineering
UNIVERSITI TEKNOLOGI MARA
40450 Shah Alam
Selangor Darul Ehsan**

ACKNOWLEDGEMENT

Alhamdulillah, all praise be to *Allah*, who has given me the strength and inspiration to complete this work. I would like to take this opportunity to express my gratitude and appreciation to many people who were involved directly or indirectly with the project. Firstly, my utmost gratitude goes to my project supervisor, Puan Kamariah Ismail for ^{her} his initial suggestions, advice, guidance and invaluable help throughout the development of the project.

I am also indebted to Inspector Rahim Said and Sarjan Safie Mamud of the Forensics Department, Bukit Aman Police Headquarters for allowing me to visit their department, to browse through the samples images of thumbprint as well as to take the sample from files of the forensic department .

Finally, a very special thank to my friend, Mohd. Zukimi Mat Junuh for his help on neural networks method. My appreciation also goes to Hairol Azmi and my family member for their support and constant encouragement.

ABSTRACT

Biometric is a technology, which identifies a person based on his physiology or behavioral characteristics. Thumbprint identification and recognition is one of the biometrics method available that has been widely used in various applications because of it is reliability and accuracy in the process of recognizing and verifying a person identity. The project highlights a thumbprint recognition system by using MATLAB software with the aid of Neural Network. A created program converts the thumbprint images to histogram data, and it can be used as input to neural network and trained. The algorithm used in order to achieve the result is called feedforward backpropagation neural network.

TABLE OF CONTENTS

CHAPTER	SUBJECT	PAGE
	TITLE PAGE	i
	DECLARATION	ii
	ACKNOWLEDGEMENT	iii
	ABSTRACT	iv
	TABLE OF CONTENT	v
	LIST OF TABLES	x
	LIST OF FIGURES	xii
	LIST OF APPENDICES	xiii
	LIST OF ABBREVIATION	xiv
CHAPTER I	INTRODUCTION	
	1.1 Biological Inspiration	1
	1.2 Thumbprint Recognition	3
	1.2.1 Overview	3
	1.2.2 Objectives of Thumbprint Recognition	3
	1.2.3 Thumbprint Characteristics	4

1.3	Scope of Project	5
1.4	Outline of the Project Report	5

CHAPTER II IMAGE PROCESSING

2.1	Introduction	6
2.2	Technique of digital image processing	6
	2.2.1 Operational Methods	7
2.3	Colored images	8
	2.3.1 Image Arithmetics	9
2.4	Histogram equation	10
	2.4.1 Description	10

CHAPTER III MATLAB SOFTWARE

3.1	Introduction	13
3.2	The Advantages of MATLAB	14
	3.2.1 Ease of Use	14
	3.2.2 Platform Independence	14
	3.2.3 Predefined Functions	15
	3.2.4 Device-Independent Plotting	15
	3.2.5 Graphical User Interface	15
	3.2.6 MATLAB Compiler	16
3.3	Disadvantages of MATLAB	16
3.4	The MATLAB Environment	17
3.5	The MATLAB Desktop	18

CHAPTER IV ARTIFICIAL NEURAL NETWORK

4.1	History of Artificial Neural Network	19
-----	--------------------------------------	----