

Universiti Teknologi MARA

**Enhancement of Most Significant Bit
(MSB) Algorithm Using Discrete Cosine
Transform (DCT) in Non-Blind
Watermarking**

Halimah Tun Binti Abdullah

**Thesis submitted in fulfillment of the requirement
for Bachelor of Science (Hons) Computer Science
Faculty of Computer and Mathematical Sciences**

January 2014

ACKNOWLEDGEMENT

Alhamdulillah, praise be upon Allah for this opportunity that we gained to experience and knowledge in making the final year project (FYP). The most gratitude for this magnificent experience and with His mercy and blessing I managed to complete the first phase which cover introduction, literature review, research methodology and produce a report on it.

We were chosen the project in multimedia security scope. The title of the proposed project is "*An Enhancement of Most Significance Bit (MSB) Algorithm using Discrete Cosine Transform (DCT) in Non-Blind watermarking*". This project about digital watermarking where can be used to hide confidential data on digital media. This project was proposed to give security and having copyright protection in images so that users cannot easily takes the images without permission from owner.

This success would not have been possible without the help of certain individual and parties. Here I would like to thank Mr. Mohamed Imran Bin Mohamed Ariff as my lecturer who has taught this subject (CSP650) that guides me in developing this research. A huge of appreciations to Ms Samsiah Binti Ahmad as my lecturer supervisor who are assist guide me in order to kept abreast of research progress.

Last but not least, my families who are provide supports and courage to me is being considerate of my situation from time to time. Then, thank to all friends who give support and willing to share information in order to complete the project research until the end. May Allah bless all of you. Thank you.

ABSTRACT

Digital watermarking is used to protect the intellectual property from malicious attack. This is because everyday people easily take the images or download the images without permission from ownership. Digital watermarking can hide data, such as in image, video and audio. In this project, the image had been chosen as the secrecy of the data. This is because many attackers attempt to retrieve the secret data from an image than audio and video. The algorithm and techniques that implemented in this project is Most Significant Bit (MSB) algorithm and Discrete Cosine Transform (DCT) as a technique for embedding process. According to how watermark detected and extracted, this project use non-blind watermarking mean need an original image during extraction process. The non-blind watermarking is more secure and can endure in a variety of attacks such as compression, rotation, cropping, filtering and others. In this project, an image from different types was used during the embedding process. Then, the result had being compared between the different types of images. The types of images are Joint Photographic Experts Group (JPEG), Bitmap (BMP), and Portable Network Graphics (PNG). This project had been done in order to test the quality watermarked image using Peak Signal to Noise Ratio (PSNR). Findings show bitmap image is a high quality watermarked image from the other types of images since its value is more than 30 decibels (dB). The robustness of the watermarked image will test by attacking the watermarked image as the enhancement of this project.

TABLE OF CONTENTS

CONTENTS	PAGE
SUPERVISOR'S APPROVAL	ii
DECLARATION	iii
ACKNOWLEDGEMENT	iv
ABSTRACT	v
TABLE OF CONTENTS	vi
LIST OF FIGURES	ix
LIST OF TABLES	x
LIST OF ABBREVIATIONS	xi
CHAPTER ONE: INTRODUCTION	1
1.0 Introduction	1
1.1 Problem Statement	3
1.2 Research Question	3
1.3 Research Objective	4
1.4 Research Scope	4
1.5 Significance of research / Contribution to the Body of Knowledge	4
1.6 Conclusion	5
CHAPTER TWO: LITERATURE REVIEW	6
2.0 Introduction	6
2.1 Types of Method In Image Watermarking	7
2.1.1 Discrete Cosine Transform (DCT) Method	7
2.1.2 Fast Fourier Transform (FFT) Method	8
2.1.3 Discrete Wavelet Transform (DWT) Method	8

2.2	Types of Algorithm In Image Watermarking	9
2.2.1	Least Significant Bit (LSB) Algorithm	9
2.3	Types of Detection In Image Watermarking	10
2.3.1	Blind Watermarking	11
2.3.2	Non-Blind Watermarking	11
2.4	Testing on Image Watermarking	11
2.4.1	Mean Squared Error (MSE)	11
2.4.2	Peak Signal To Noise Ratio (PSNR)	12
2.5	Conclusion	13
CHAPTER THREE: RESEARCH METHODOLOGY		14
3.0	Introduction	14
3.1	Overview of Project Formulation Framework	14
3.2	Development Methodology	15
3.2.1	Planning	16
3.2.2	Analysis	17
3.2.3	Design and Implementation	19
3.2.4	Testing	28
3.3	Research Planning	28
3.4	Conclusion	29
CHAPTER FOUR: FINDINGS AND ANALYSIS		30
4.0	Introduction	30
4.1	Embedding Process	30
4.2	Extracting Process	32
4.3	Result of Testing	34
4.4	Result Analysis	38
4.5	Conclusion	39