

IEE SOFT

Image Embedding & Extraction Software
Implementation of Watermarks system.



Shahid Mushtaq

MCS. Data Communications and Networks
(Final Project)

Supervisor

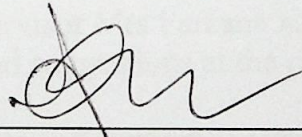
Mrs. Farzana Khan

Bahria Institute of Management and Computer Sciences.
Bahria University, Islamabad.

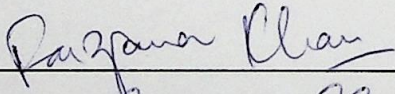
CERTIFICATE OF APPROVAL

It is to certify that this project IEE SOFT fulfills the Degree requirements of Bahria University.

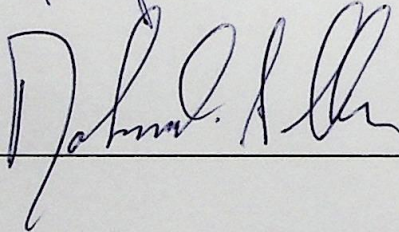
Signed and Checked by:



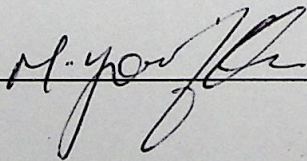
Fazal-e-Wahab (Head of Department, CS)



Mrs. Farzana Khan (Project Supervisor)



Dr. M.A. Khan (Internal Examiner)



Dr. Muhammad Yousaf. (External Examiner)

Acknowledgment

In the name of Allah Almighty the most gracious, the most merciful
&
Peace and blessings be upon the Last Prophet Hazrat Muhammad (SAW)

At the end of our day and night effort we are very thankful to the Almighty Allah for his unlimited blessings upon us, Nobody can accomplish anything Without his will.

After that we are very grateful to our project supervisor Mrs.Farzana khan for her kind supervision. She gave us right directions and suggestions at the right time.

How can we forget the prays of our parents and support of our friends.

Table of Contents

Chapter No.	Content	Page No.
1.	Introduction	
1.1	Method of Approach	
1.1.1	Objectives of the Study	
1.1.2	Scope of the Study	
1.2	Structure of the Study	

I dedicate all my work to my Parents.

Table of Contents

Chapter No.	Contents	Page No.
1. Introduction	2
1.1 Fields of Application	2
1.1.1 Ownership Identification and Authentication	3
1.1.2 Security of Data and Conditional Access	4
1.2 Existing Problem	4
1.3 Objective	
2. Watermarks	7
2.1 Watermarking an Introduction	9
2.1.1 Visible watermarks	10
2.1.2 Invisible watermarks	11
2.2 Watermarking Background	12
2.2.1 Terminology	12
2.2.2 Steganography and watermarking	12
2.2.3 History	12
2.3 Evaluation	14
2.3 Basic Requirements	16
2.3.1 Perceptibility	17
2.3.2 Robustness	21
2.3.3 Capacity	21
2.3.4 Speed	21
2.4 Types of watermarking	21
2.5 General Techniques	23
2.7 Watermarking Methodology	24
2.8 Watermarking under Attacks	31

Chapter No.	Contents	Page No.
3	Image Processing	32
3.1.1	Image File Formats	32
3.1.1	JPEG (Joint Photographic Experts Group)	32
3.1.2	GIF (Graphics Interchange Format)	32
3.1.3	PNG (Portable Network Graphic)	33
3.1.4	TIFF (Tagged Image File Format)	34
3.1.5	Bitmap (Microsoft Windows Bitmap)	34
3.2	Frequency Domain Processing of Images	35
3.3	Image Enhancement	35
3.4	Convolution based Images	36
3.5	Area Based Image Processing algorithms	37
3.5.1	The Linear Filter a Specific Case of the Area-Based Algorithm	37
3.5.2	Uniform filter	39
3.5.3	Triangular filter	39
3.5.4	Gaussian filter	39
3.5.5	The Non-Linear Filter	39
3.5.6	Lowpass Filter	40
3.5.7	Median Filter	40
3.5.8	Highpass Filter	44
3.6	Edge Detection	46
3.7	Histogram-based Operations	48
3.7.1	Contrast stretching	48
3.7.2	Equalization	48
3.7.3	Other histogram-based operations	48
3.8	Mathematics-based Operations	49
3.8.1	Binary operations	49
3.8.2	Arithmetic-based operations	51
3.9	Geometric Operations On Images	52
3.9.1	Image Rotation	53

Chapter No.	Contents	Page No.
	3.9.2 Image Scrolling	54
	3.9.3 Image Zooming	54
	3.10 JPEG Image Compression	56
	3.11 Gray-Level	58
4.	System Analysis	59
4.1	Analysis	59
	4.1.1 Requirement Analysis	59
	4.1.2 Domain Analysis	59
4.2	Steps for Object Oriented Analysis	60
4.3	Use Cases	60
4.4	Use Case Analysis	60
4.5	Actors	61
4.6	Use Cases	61
4.7	Use Case Expanded Format	62
4.8	Domain Analysis	72
4.9	Conceptual Model	72
5.	System Design	79
5.1	Activity Diagrams	80
5.2	Class	81
5.3	Class Diagrams	86
5.4	Attribute	86
5.5	Relationships	87
5.6	Sequence Diagrams	89

Chapter No.	Contents	Page No.
6. Implementation		96
6.1 Watermarking Techniques and Algorithms		96
6.1.1 Technique 1		98
6.1.2 Technique 2		101
6.2 Hidden Digital Watermarks in Images		102
6.2.1 Watermark Extraction Method		102
6.3 Class Description		103
6.4 Tool Used.....		108
7. Testing		109
7.1 What is Testing		109
6.2 Different Testing techniques.....		110
6.3 The Object Oriented levels of Testing		111
8. Future Enhancements and Conclusion		112
8.1 Future Enhancements.....		113
References and Bibliography		114