

**Universiti Teknologi MARA**

**Analysis on Digital Image  
Watermarking Using DCT-DWT  
Techniques**

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## **ABSTRACT**

In recent years, digital images are used in various platforms by all means of purpose by people and also creators. The data also can be easily copied or altered, and anyone with a computer can create the forgeries too. The work on digital watermarking of images has introduced several strategies over the years, either using spatial or transform domain. Nevertheless, as the technologies are evolving, the digital images become more vulnerable towards illegal threats such as illegal duplication and removal attack without the creator's consent and the approach or watermarking techniques used are still aren't robust enough to secure the digital images hence, more approach can be applied to make it more secure. So to tackle the problem, the combined or hybrid of Discrete Cosine Transform (DCT) and Discrete Wavelet Transform (DWT) watermarking techniques are developed in this project to analyses and evaluate the performance of the proposed techniques. The techniques are developed and applied to the image according to the watermarking process, which started from the embedding process until the watermark extraction. Based on the results, the purposes of the project has been achieved as the watermarking techniques showed a good performance in terms of imperceptibility and robustness, measured by the two measuring parameter which are the Peak Signal-to-Ratio (PSNR) and correlation factor values.

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# CHAPTER 1

## INTRODUCTION

This chapter provides the background and the overview for the project on Analysis on Digital Watermarking Using DCT-DWT Techniques. It also gave the details of the objectives that have been achieved, and the issues or problems arose that lead to this project. In this chapter, the project's objectives were explained in detail, along with the scope and the significance that contributed to this project.

### 1.0 Introduction

Nowadays, digital images are used in various platforms for an indefinite amount of purpose by the creators. However, digital images are vulnerable to multiple attacks, including criminal trials and copyright infringement. So, to secure the digital images along with the creators' copyrights, discrete and invisible digital watermarking are applied to secure the images alongside the visible watermark.

### 1.1 Background Study

In recent years, digitalization has played a big role in technology, be it images, videos and audios. However, even digital multimedia are digitized, there are still threats that attack their vulnerabilities. This issue has surged a lot of concerns among the creators themselves. Their contents can be copied and modified with various alterations to the point it will be hard to distinguish the original and duplicate. Thus, this consequence affected the creators' especially to file lawsuits or other legal actions for the copyright infringements.

One of the ways to achieve information security is by digital watermarking. This is because digital watermarking is a technique where hidden or secret data is embedded into an image. This technique is an effective tool to identify the document or image source, writer, authorized users or anyone within the same group. Aside from that, watermarking also can be used to detect any malicious activities that forced upon a document or images. The digital watermarking has been classified into two groups