



Enhancing Data Compression Rate Using Steganography: A Review

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Abstract – *In this paper steganography and various steganographic techniques have been covered to fulfil the purpose. The purpose is to enhance the data compression rate using steganography. The work will be accomplished by introducing a new steganographic technique which will be used to hide large amount of text in images. The technique is based on the compression algorithm which will enhance the compression rate. The compression algorithm to be used will work in a range of 1 bit to 8 bits per pixel ratio. By applying this algorithm an application will be developed which would enhance the storage capacity of image for the purpose of hiding text.*

Keywords – *Steganography, cryptography, secret key, LSB, embedding, extraction.*

1. INTRODUCTION

Steganography is an art and science of writing hidden message in such a way that no one apart from the sender and intended recipient suspect the existence of the message, a form of security through obscurity. The word steganography is of Greek origin and means “concealed writing” from the Greek word steganos meaning “covered or protected” and grapheis meaning “writing”.

The first recorded use of the term was in 1499 by Johannes Trithemius. Generally, message will appear to something else like images, article, shopping list or some other text and classically, the hidden message may be invisible between the visible lines of a private letter. Steganography includes the concealment of information within computer files. In digital steganography electronic communications may include steganographic coding inside of a transport layer, such as a document file, image file, program or protocol. Media files are ideal for steganographic transmission because of their large size. As a simple example, a sender might start with an innocuous image file and adjust colour of every 100th pixel to correspond to a letter in the alphabet, a change so subtle that someone not specifically looking for it is unlikely to notice it.

In this research work, the enhancement in data compression rate using steganography, bmp images will be experimented. In relation to which compression is being propounded which will facilitate the hiding of enlarge text in an image. An underlying compression algorithm with maximum compression rate of eight bits per pixel will be enacted. Few images will be observed in which different sizes of text files will be hidden to conclude the result as stegano images which will not attribute any noticeable change.

2. REVIEW OF LITERATURE

The review of literature reveals that further investigation in the field is required. So in relation to this work many research developments have been taken into consideration.

Great scholar **James C. Judge** in **2001** stated that steganography is the term applied to any number of processes that will hide a message within an object, where the hidden message will not be apparent to an observer, as in [1]. One of the researches by **Muhaim bin Mohamed Amin et al** in **January 2003** has put forward that the system used to enhance the compression rate using LSB technique by randomly dispersing the bits of the message in the image. This technique makes it harder for unauthorized people to extract the original message, as in [2]. The pioneer researcher **T. Morkel et al** in **June / July 2005** asserted that different applications have different requirements of the steganography technique used. For example, some applications may require absolute invisibility of the secret information, while others require a larger secret message to be hidden, as in [3].

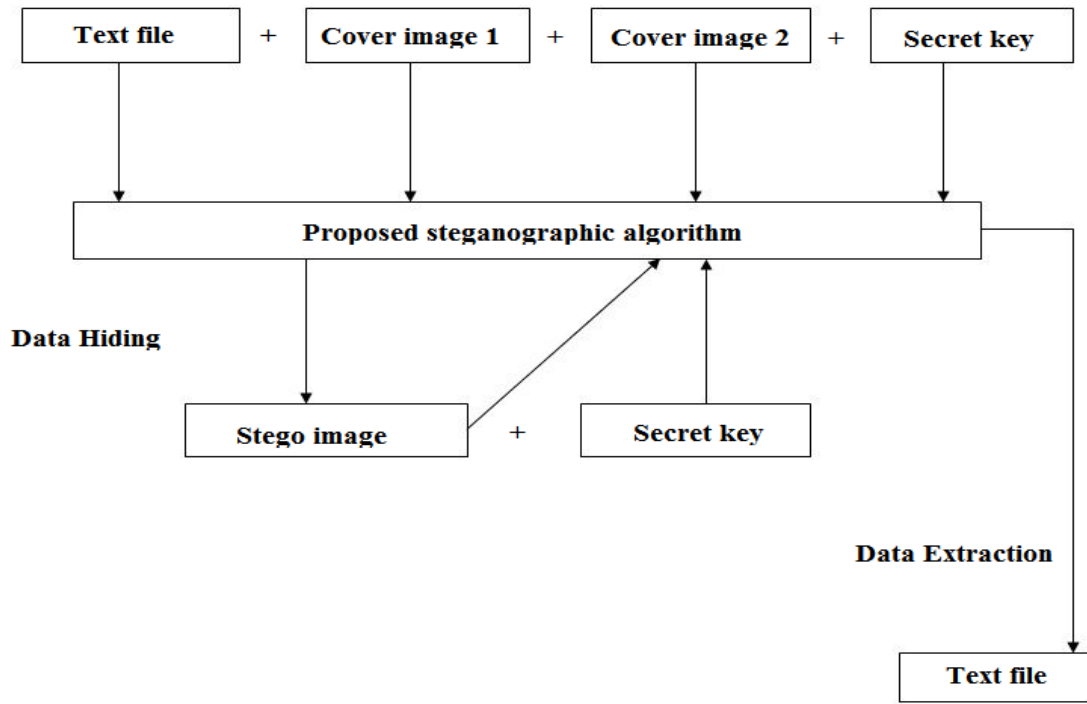
In one another study by **Shawn D. Dickman** in **July 2007**, it has been stated that Steganography is a useful tool that allows covert transmission of information over an overt communications channel, as in [4]. One Another research by **Namita Tiwari et al** in **September 2010** proposed that many different carrier file formats can be used, but digital images are the most popular because of their frequency on the Internet, as in [5]. Prominent research scholar **Yongzhen Zheng et al** proposed an approach in **November 2011** which was based on the principles of LSB Replacement Steganography algorithm and which was used to identify steganography software by Core Instructions Template Matching, as in [6]. Research scholars **Dipesh Agrawal & Samidha Diwedi**, in **May 2013** propounded that many steganography techniques can be used like least significant bit (LSB), layout management schemes replacing only 1 & apos;s or only zero & apos;s from lower nibble from the byte for hiding secret message in an image, as in [7].

The study of earlier developments has concluded that in all the researches done earlier by other researchers there was a problem of size of message which they want to hide and so compression rate was not that much efficient. The

compression rate of earlier steganography technique was up to 3 bits only. So there is need to enhance the compression rate, which is the aim of this research work.

3. PROPOSED TECHNIQUE TO BE USED

The aim of this research is to hide large amount of data in images by applying compression technique. The technology is based on the compression algorithm which will enhance the compression rate of hiding messages in images. The compression algorithm to be used will work in a range of 1 bit to 8 bits per pixel ratio. By applying this algorithm an application will be developed that would help users to efficiently hide the text file inside an image.



Layout of Proposed System

4. CONCLUSION

This work introduces a new steganography technique for hiding text files in images. This technique is based on an underlying compression algorithm with maximum compression ratio of 8 bits pixel. It has been found that for bmp images this algorithm works very efficiently. Hence this new steganography approach is robust and very efficient for hiding text files in images. Further work in this field will bring some new results and help researchers to make more developments in the field.

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