**Batch:\_\_\_\_\_\_\_\_\_\_ Roll No.:\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Experiment No.**

**Grade: AA / AB / BB / BC / CC / CD /DD**

**Signature of the Staff In-charge with date**

|  |
| --- |
| **Title:** Implementation of Steganography using LSB algorithm. |

**Objective:** To study steganography using bit plane slicing

**Expected Outcome of Experiment:**

|  |  |
| --- | --- |
| **CO** | **Outcome** |
| **CO4** | Design & implement algorithms for digital image enhancement, segmentation & restoration. |

**Books/ Journals/ Websites referred:**

1. http://www.mathworks.com/support/
2. www.math.mtu.edu/~msgocken/intro/intro.html.
3. R. C.Gonsales R.E.Woods, “Digital Image Processing”, Second edition, Pearson Education
4. S.Jayaraman, S Esakkirajan, T Veerakumar “Digital Image Processing “Mc Graw Hill.
5. S.Sridhar,”Digital Image processing”, oxford university press, 1st edition."

**Pre Lab/ Prior Concepts:**

Image enhancement techniques in spatial domain

1. Bit plane slicing.

Steganography is the art and science of communicating in a way which hides the existence of the communication. Steganography plays an important role in information security. It is the art of invisible communication by concealing information inside other information. The term steganography is derived from Greek and literally means “covered writing”. A Steganography system consists of three elements: cover image (which hides the secret message), the secret message and the stego-image (which is the cover object with message embedded inside it).

A digital image is described using a 2-D matrix of the colour intestines at each grid point (i.e. pixel). Typically gray images use 8 bits, whereas coloured utilizes 24 bits to describe the colour model, such as RGB model. The Steganography system which uses an image as the cover, there are several techniques to conceal information inside cover-image. The spatial domain techniques manipulate the cover-image pixel intensity values to embed the secret information. The secret bits are written directly to the cover image pixel intensity bytes by changing least significant bit. Consequently, the spatial domain techniques are simple and easy to implement. The Least Significant Bit (LSB) is one of the conventional techniques in spatial domain image Steganography. The LSB based image steganography embeds the secret information in the least significant bits of pixel values of the cover image.

**Encoder:** To hide text message into an image (cover)

Step 1: Accept small secrete text message and cover image.

Step 2: Convert secrete message into series of bits.

Step 3: Read a pixel from image and read message bit, to hide that bit into Least Significant Bit of pixel intensity.

Step 4: Continue step 3 until all secrete message bits are not hidden in the image.

Step 5: save new image as stego-image.

**Decoder:** To retrieve message from stego-image.

Step 1: Accept stego-image.

Step 2: Read the pixel intensity from stego-image and convert the intensity value in binary representation

Step 3: Read LSB bit of this binary value and save it in text file.

Step 4: Continue step 2 and 3 until all message bits are extracted.

Step 5: Now convert message bits into original text message and display this message.

**Implementation Details:**

**Write Algorithm and Matlab commands used:**

**Conclusion:**

Steganography is one of the most powerful techniques to conceal the information inside a cover. The cover can be of any type such as image, audio, video, text and information can be such as image, audio, video, text. In this experiment text data is hidden inside an image. So it’s a covert way of communication.

**Date: \_\_\_\_\_\_\_\_\_\_\_\_\_ Signature of faculty in-charge**

**Post Lab Descriptive Questions**

1. Explain the need of LOG operator.
2. Explain the technique of thresholding for segmentation.