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# Image Steganography to Secure the Information Using Machine Learning

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**ABSTRACT:** Steganography is an art that involves communication of secret data in an appropriate carrier, e.g., image, audio, video or TCP/IP header file. Steganography's goal is to hide the very existence of embedded data so as not to arouse an eavesdropper's suspicion. For hiding secret data in digital images, large varieties of steganographic techniques are available, some are more complex than others, and all of them have their respective pros and cons. Steganography has various useful applications and the technique employed depends on the requirements of the application to be designed for. For instance, applications may require absolute invisibility of the secret data, larger secret data to be hidden or high degree of robustness of the carrier. This paper intends to give thorough understanding and evolution of different existing digital image steganography techniques of data hiding in spatial, transform and compression domains. It covers and integrates recent research work without going in to much detail of steganalysis, which is the art and science of defeating steganography.

**KEYWORDS**: Image steganography, Image hiding, Text hiding, Steganography

## I. INTRODUCTION

Throughout time, confidentiality has always been important. Whether it is carved in stone, written on paper or sent over the Internet, correspondence between two persons is exposed to tampering or eavesdropping. Therefore, it is necessary to provide a mechanism that protects written information. Internet is a great convenience which offers secure data communication of important messages, secret information, variety of images and documents. In order to prevent the unauthorized access of important messages and images from malicious fraudsters, one need to make it more secure by sending the encrypted messages over the networks. To accomplish and build such secure systems, many data hiding and encryption techniques have been proposed in the last few decades. Both the data hiding and encryption techniques are found to be the main mechanisms in data security. However, use of former mechanism has been increasing recently due to some demerits have been found in the later mechanism. Corresponding author. 196 C. Maitiet al. The formal mechanism of data encryption uses the method to convert a message into a ciphertext message by using some encryption algorithm and the ciphertext message is then sent to the recipient who has the authorization to receive and get the original message. To receive the original message which has been sent by the sender, recipient uses a key to obtain the decrypted message. Any malicious user who does not have the key cannot break the security of ciphertext which looks like some meaningless code. Though data encryption is proved to be a secure method to hide data, it has some weaknesses. For example, sometimes appearance of ciphertexts.

## II. EXISTING SYSTEM

1. In **Data Security**: Develop a system to hide sensitive information within images to ensure data confidentiality.

2. **Detection Avoidance**: Create methods to hide information in such a way that it's difficult for detection algorithms to uncover.

3. **Machine Learning Integration**: Implement machine learning models to enhance the hiding and detection processes, possibly by optimizing embedding techniques or improving detection accuracy.

4. **Security Analysis**: Conduct thorough security analysis to evaluate the strength of the steganographic techniques against various attacks, including machine learning-based detection methods.

### III. METHODOLOGY AND DISCUSSION

A. *Methodology:*

Iterative waterfall Model is a systematic approach that begins at the feasibility study phase and progress through analysis, design, coding, testing, integration and maintenance. Feedback paths are there in each phase to its preceding phase as show in the fig to allow the correction of the errors committed during a phase that are detected in later phase.
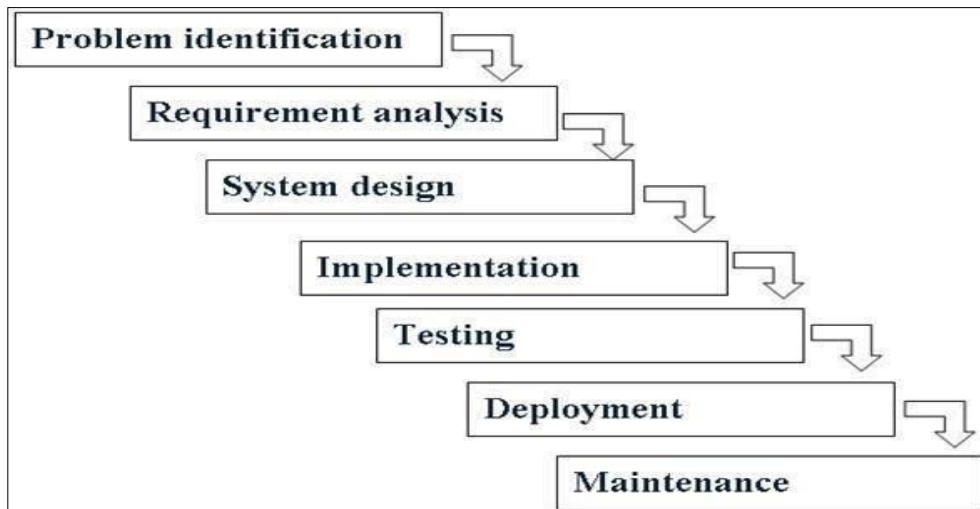


Fig 1: Waterfall Model

B. *Problem Definition:*

Steganography become more important as more people join the cyberspace revolution. Steganography is the art of concealing information in ways that prevent the detection of hidden messages. Steganography includes an array of secret communication methods that hide the message from being seen or discovered.

The goal of steganography is to avoid drawing suspicion to the existence of a hidden message. This approach of information hiding technique has recently become important in a number of application areas. Digital audio, video, and pictures are increasingly furnished with distinguishing but imperceptible marks, which may contain a hidden copyright notice or serial number or even help to prevent unauthorized copying directly.

C. *Modules:*
   *There are three modules in this system*
   - *Admin*
     - *Login*
     - *Manage Managers*
     - *Manage employees*
     - *Manage projects*
     - *Share secret key and messages(encode)*
     - *Logout*
   - *Manager*
     - *Login*
     - *Profile*
     - *Manage Project*
     - *Decode secret key and messages*
     - *Assign project t employee*
     - *Logout*

- *Employee*
    - *Login*
    - *Profile*
    - *My projects*
    - *Update project status*
    - *Logout.*

D. *Implementation*

**Module** 1 is implemented using html, css, javascript and java.
The data is stored in database using MySQL. Admin can login and manage employee details, manager details, project details. Admin can share secret key n message to the manager.

**Module 2** is manager module where manager can manage project details like name, file, description of project and decode the secret data sent by admin and data is stored in MySQL database.

**Module 3** is employee module where employee can login and view project details

Maintenance means restoring something to its original conditions. Enhancement means adding, modifying the code to support the changes in the user specification. System maintenance conforms the system to its original requirements and enhancement adds to system capability by incorporating new requirements. Thus, maintenance changes the existing system, enhancement adds features to the existing system, and development replaces the existing system. It is an important part of system development that includes the activities which corrects errors in system design and implementation, updates the documents, and tests the data.

E. *Testing*

Software Testing has different goals and objectives. The major objectives of Software testing are as follows:

- Finding defects which may get created by the programmer while developing the software.

- To prevent defects.

- To make sure that the end result meets the business and user requirements.

- To ensure that it satisfies the BRS that is Business Requirement Specification and SRS that is System Requirement Specifications.

- To gain the confidence of the customers by providing them a quality product.

F. *Deployment*

The deployment phase is the final step in the software development life cycle and delivers the final product to the customer in a live production environment. After the product deploys, the product is ready for customers to use.

G. Maintenance

Software maintenance is the process of changing, modifying, and updating software to keep up with customer needs. Software maintenance is done after the product has launched for several reasons including improving the software overall, correcting issues or bugs, to boost performance, and more.
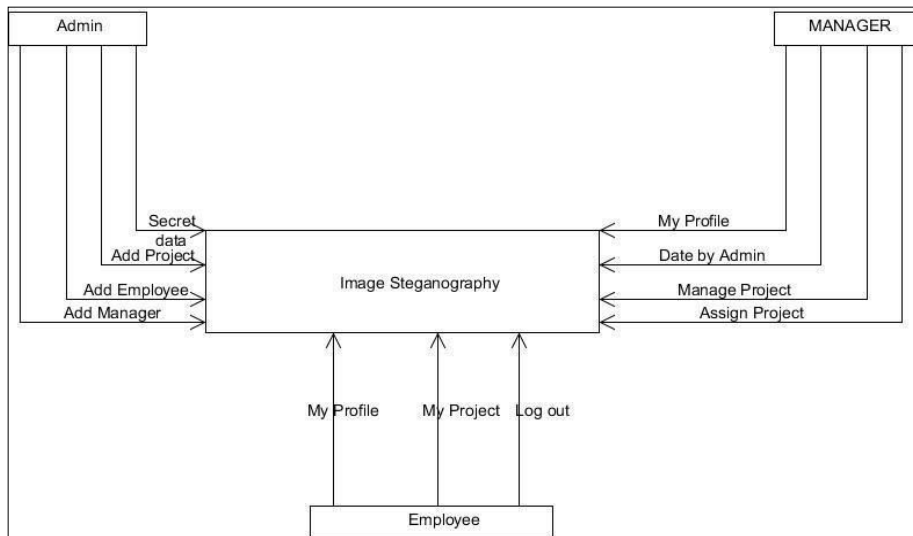
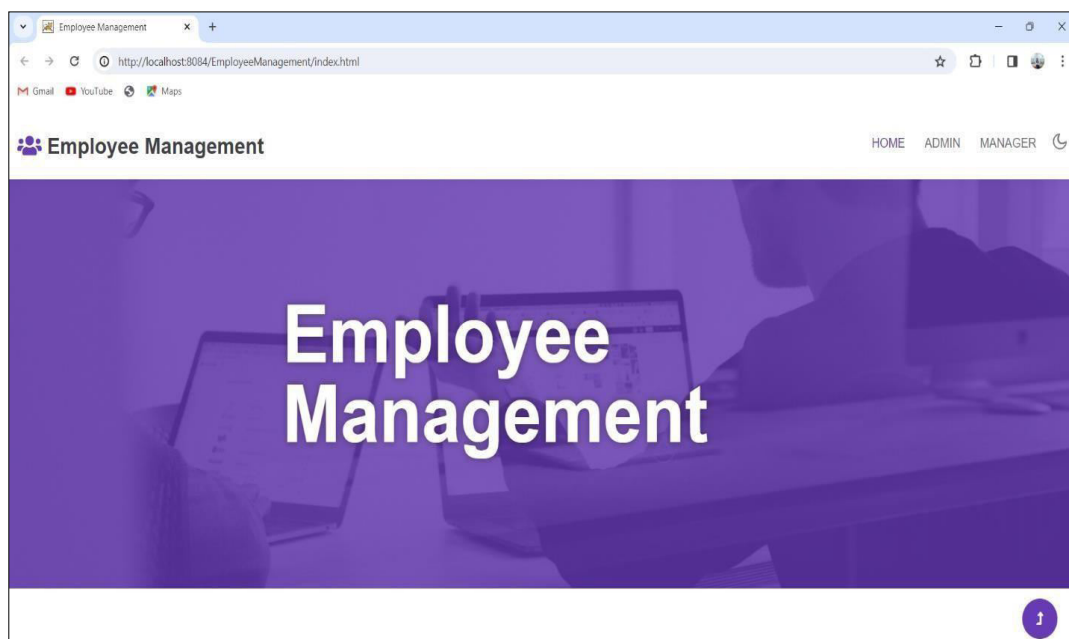## IV. SYSTEM ARCHITECTURE



Fig 2: System Architecture
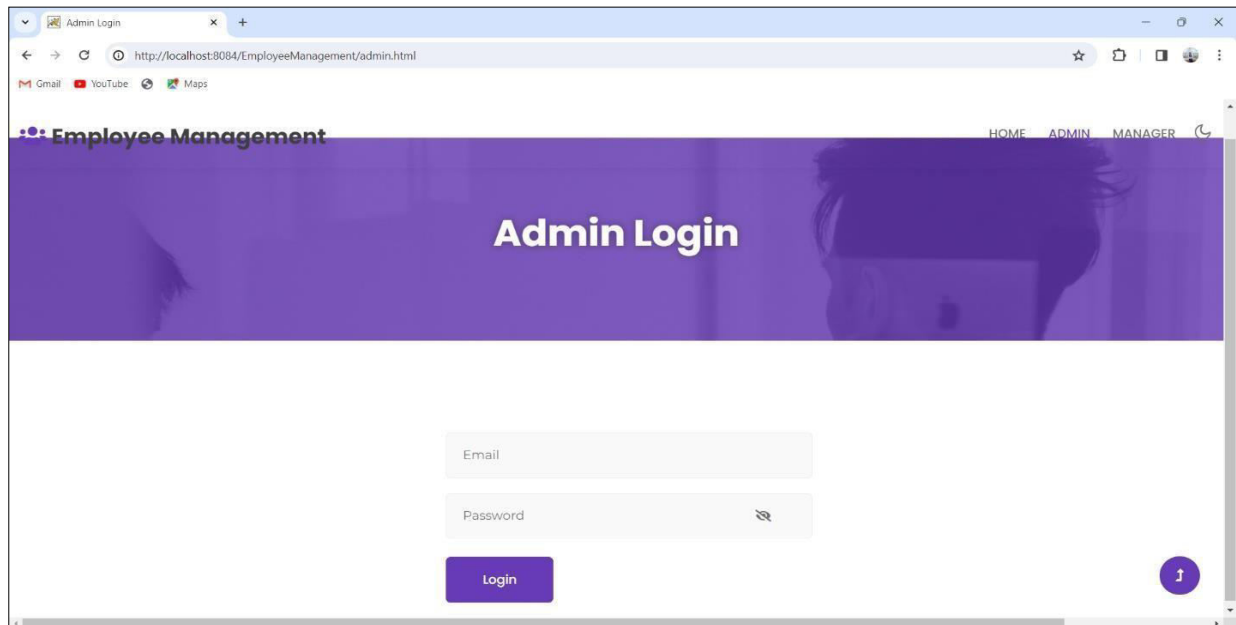
## V. SIMULATION RESULTS



Fig. 3. Home Page
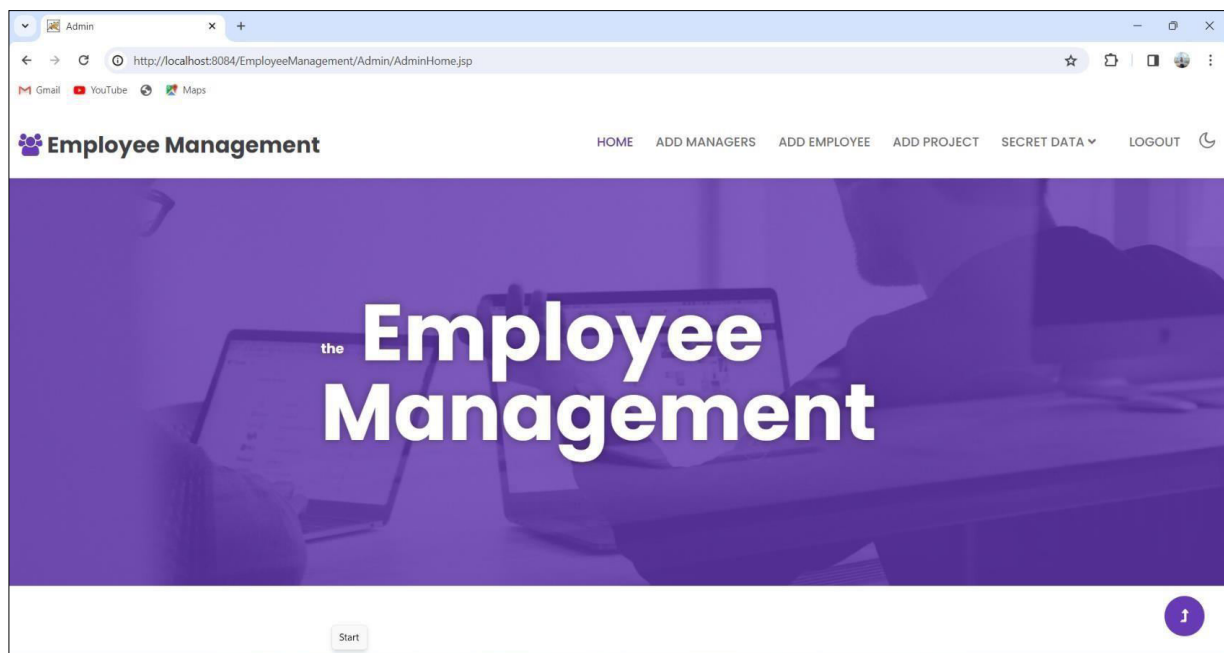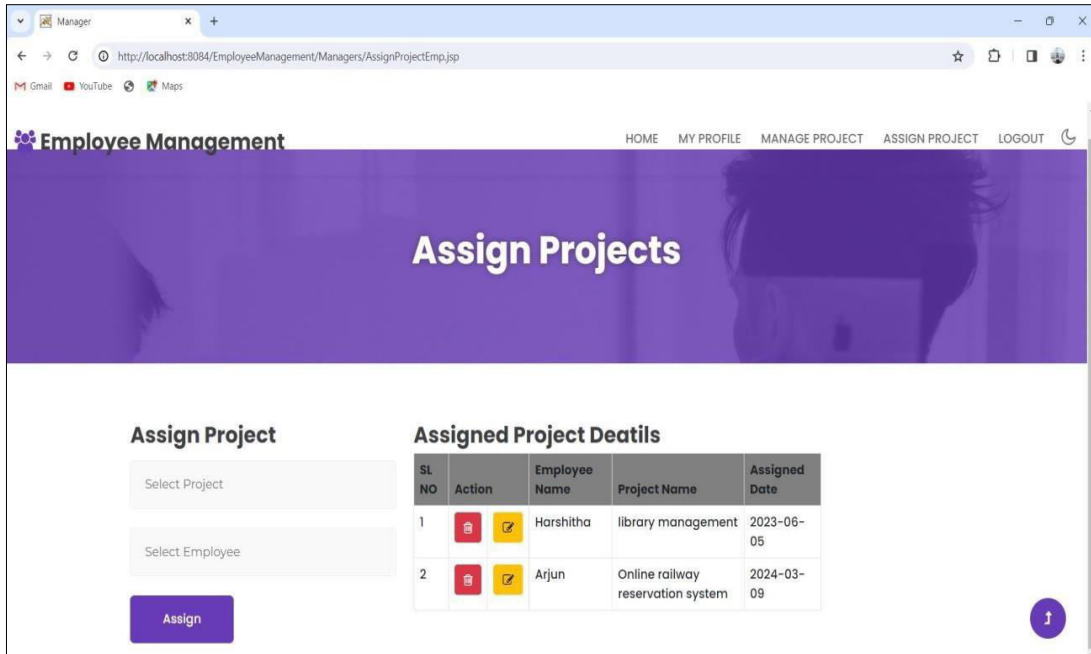
Fig 4: Admin Login Page



Fig 5: Admin Page
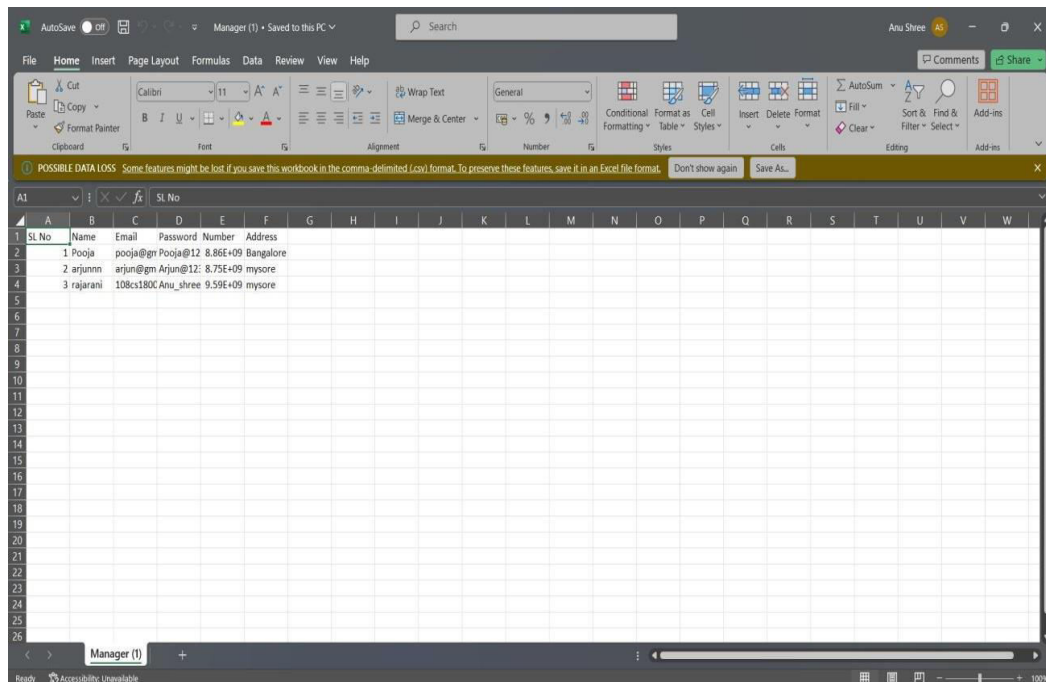
Fig 6: Manager Login Page



Fig 6: Employee Details in Excel

## VI. CONCLUSION AND FUTURE WORK

The Steganography transmits secrets through apparently innocuous covers in an effort to conceal the existence of a secret. Digital image steganography and its derivatives are growing in use and application. In areas where cryptography and strong encryption are being outlawed, citizens are looking at steganography to circumvent such policies and pass messages covertly. As with the other great innovations of the digital age: the battle between cryptographers and cryptanalysis, security experts and hackers, record companies and pirates, steganography and Steganalysis will continually develop new techniques to counter each other.

The possible use of steganography technique is as following:

- Hiding data on the network in case of a breach.
- Peer-to-peer private communications.
- Posting secret communications on the Web to avoid transmission.
- Embedding corrective audio or image data in case corrosion occurs from a poor connection or transmission.

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