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Secure Image Sharing using Steganography

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ABSTRACT

Pic's Seclusion with my Concede is the android application to prevent possible privacy leakage of a photo. The application is designed with a mechanism to enable each individual's photo be aware of the posting activity and participate in the decision making on the photo sharing. For this purpose, the system is proposed by combining digital signature along with the shared image the application can provide the data security for that image. The user can share the image combined with the steganography digital signature. If any other user who wants to share that particular image the system detects the digital signature and identifies the owner of that image. Then the permission request is automatically redirect to the owner, if the owner accepted the request to share the image then it will be viewed by the user.

Keyword:— *Steganography, Privacy, Security, Sharing Image*

I. INTRODUCTION

Steganography is the art of hiding the fact that communication is taking place by hiding information in other information. It

is the practice of hiding private or sensitive information within something that appears to be nothing out to the usual. If a person views the object that the information is hidden to him and he will have no idea that there is any hidden information, therefore the person will not attempt to decrypt the information. What steganography usually does is exploit human perception, human senses are not trained to look for files that have information inside of them, although this software is available that can do which is called steganography.

1.1 About the System

1.1.1 Scope of the Project

Photo sharing is the publishing or transfer of a user's digital photos online. Photo-sharing websites offer services such as uploading, hosting, managing and sharing of photos. This function is provided through both websites and applications that facilitate the upload and display of images. The term can also be loosely applied to the use of online photo galleries that are set up and managed by individual users, including photo blogs. Sharing means that other users

can view but not necessarily download the photos, users being able to select different copyright options for their photos.

Unfortunately, it may leak user's privacy if they can post, comment, and tag a photo freely. Many social networking sites are also incorporating photo sharing features, allowing users to very easily upload and post photos for their friends and families. These systems are focusing on these privacy concerns and needs, as well as exploring ideas for privacy protection mechanisms, for users of social networking sites such as Facebook. In understanding user's current concerns and behavior, we can design tools they desire, adopt, and ones they will be motivated to use.

II. SYSTEMS ANALYSIS

Systems Analysis is the dissection of a system into its component pieces to study how those component pieces interact and work. System Analysis describes what the customer wants, establishes a basis for design and establishes a target for validation. It bridges the gap between a system-level description that describes overall system or business functionality as it is achieved by applying software, hardware, data, human and other system elements and a software design that describes the software's application architecture. The purpose of System Analysis is to obtain a thorough and detailed understanding of the project and to break it down into discrete requirement, which are then clearly, reviewed and agreed upon the user's requirements. The following are the rules to be followed when creating the analysis model:

- The model should focus on requirements that are visible within the problem. The level of abstraction should be relatively high.
- Delay consideration of infrastructure

and other non-functional models until design.

- Each element of the requirements model should add to an overall understanding of software requirements and provide insight into the information domain, function and behavior of the system.
- Keep the model as simple as it can be.

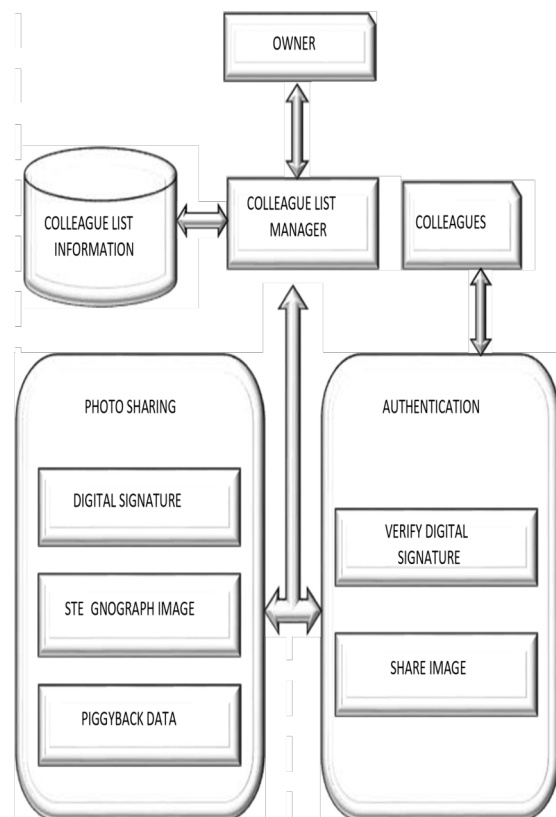


Figure 1 Architecture Diagram

The Figure 1 shows the Architecture Diagram of the application. The User need to Login and can manage the friend list the details has been stored in the database. The user can share this image, the application uses the steganography by combining the digital signature. When the message received, the steganography detects digital signature and send the acknowledgement to the owner. The acknowledgement is accepted then the image can be viewed otherwise it cannot be viewed.

2.1 Existing System

Online Social Networks have become integral part of our daily life with each other, fulfilling our social needs the needs for social interactions, information sharing, appreciation and respect. It is also this very nature of social media that makes people put more content, including photos, over OSNs without too much thought on the content. However, once something, such as a photo, is posted online, it becomes a permanent record, which may be used for purposes we never expect. For example, a posted photo in a party may reveal a connection of a celebrity to a mafia world. Because OSN users may be careless in posting content while the effect is so far reaching, privacy protection over OSNs becomes an important issue.

2.2 Proposed System

In proposed system, the user post the image that image contains digital signature along itself. After sharing that image if any user who will need to access that particular image it will ask the permission to the owner. The owner information's are appended with the digital signature it will automatically redirected to the user. We show that our system is superior to other possible approaches in terms of recognition ratio and efficiency. Our mechanism is implemented as an Android application platform.

2.3 Feasibility Study

2.3.1 Technical Feasibility

Evaluating the technical feasibility is the trickiest part of a feasibility study. This is because, now, not too many detailed designs of the system, making it difficult to access issues like performance, costs (on account of the kind of technology to be deployed) etc.

Several issues must be considered while doing a technical analysis :

- Understand the different technologies involved in the proposed system: Before commencing the project, we must be very clear about what are the technologies that are to be required for the development of the new system.
- Find out whether the organization currently possesses the required technologies: Is the required technology available with the organization?
- If so, is the capacity sufficient? For instance: "Will the current printer be able to handle the new
- reports and forms required for the new system?"

2.3.2 Operational Feasibility

Proposed projects are beneficial only if they can be turned into information systems that will meet the organization operating requirements. Simply started, this test off feasibility asks if the system will work when it is developed and installed. Are there major barriers to implementation? Here are questions the will help test the operational feasibility of a project:

- Is there enough support for the project from management from user? If the current system is well liked and used to the extent that persons will not be able to see reasons for change, there may be resistance.
- Are the current business methods acceptable to the user? If they are not, User may welcome a change that will bring about a more operational and useful systems.
- Have, the user been involved in the planning and development of the project? Early involvement reduces

the chances of resistance to the system and in general and increases the likelihood of successful project.

- Since the proposed system was to help reduce the hardships encountered in the existing manual system, the new system was considered to be operational and feasible.

2.3.3 Economic Feasibility

Economic feasibility attempts to weigh the costs of developing and implementing a new system, against the benefits that would accrue from having the new system in place. This feasibility study gives the top management the economic justification for the new system.

A simple economic analysis which gives the actual comparison of costs and benefits is much more meaningful in the case. In addition, this proves to be a useful point of reference to compare actual costs as the project progresses. There could be various types of intangible benefits on account of automation. These could include increased customer satisfaction, improvement in product quality, better decision making, timeliness of information, expending activities, improved accuracy of operations, better documentation and record keeping, faster retrieval of information, better employee morale.

III. SYSTEM DESIGN

The purpose of the design phase is to plan a solution for the problem specified by the requirements. System design aims to identify the modules that should be in the system, the specification of these modules and how they interact with each other to produce the desired result. The goal of the design process is to produce a model or representation of a system which can be used later to build that system. The

produced model is called the design of the system.

3.1 System Flow

3.1.1 Use Case Diagram

Use case diagrams are behavior diagrams used to describe a set of actions (use cases) that some system or systems (subject) should or can perform in collaboration with one or more external users of the system (actors). Each use case should provide some observable and valuable result to the actors or other stakeholders of the system. The elements associated with the use case diagram are actors, use cases, associations, and relationships.

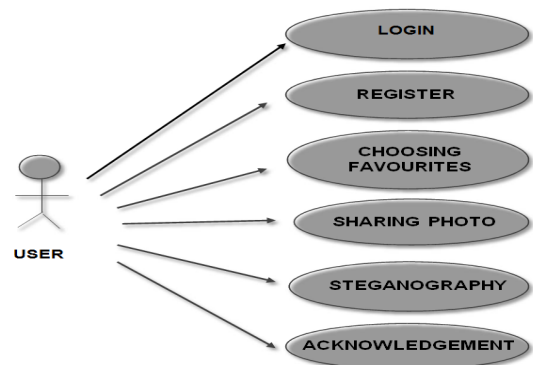


Figure 2: Use case Diagram

The Figure 2 Shows the Use case diagram of the system, which describes a set of actions that are carried out by the various users of that system. The user can use the various use cases in the system.

3.1.2 Sequence Diagram

A Sequence diagram in Unified Modeling Language is a kind of interaction diagram that shows how processes operate with one another. It is a construct of a message sequence chart.

It depicts the objects and classes involved in the scenario and the sequence of messages exchanged between the objects needed to carry out the functionality of the

scenario. Sequence diagrams are typically associated with use case realizations in the Logical View of the system under development. Sequence diagrams are sometimes called event diagrams, event scenarios, and timing diagrams.

The Figure 3 Shows the sequence diagram of the system, which describes the flow of the data and the various function that carried out by each module. The Figure 4 shows the flow Diagram of the application. The User need to Login and can manage the friend list the details has been stored in the database. The user can share this image, the application uses the steganography by combining the digital signature. When the message received, the steganography detects digital signature and send the acknowledgement to the owner. The acknowledgement is accepted then the image can be viewed otherwise it cannot be viewed.

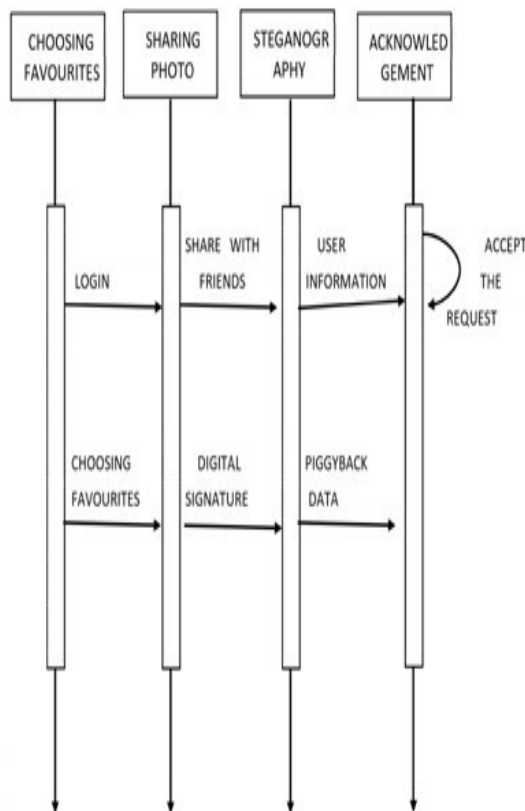


Figure 3 Sequence diagram

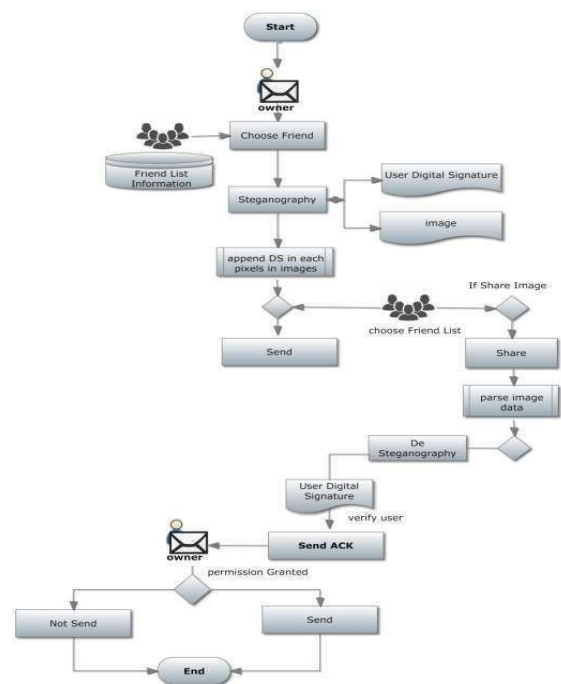


Figure 4: Flow Diagram of the application

3.2 Database Design

3.2.1 Messages

The Messages table stores the information like sender, receiver, owner, message, image name, and acknowledgement. The table get updated when the user share, the image. If the image is shared then the acknowledgement field updated automatically, only if owner accepted the image is viewed.

Table 1: Messages Table

Field	Type	Null
Sender	varchar(20)	No
Receiver	varchar(20)	No
Owner	varchar(20)	No
Message	Blob	No
Imagename	varchar(50)	No

3.2.2 User

If the new user register their details it is updated in the user table. The table 1 shows the details of the user registration table.

Table 2: User Table

Field	Type	Null
Name	varchar(20)	No
Username	varchar(20)	No
Password	varchar(20)	No
Image	blob	No

4.2.3 User1

The Table 3 Stores the colleague list of user. Whenever the new user is registered, the new table with the following fields will be created. Each and every user has the separate table for their colleague list.

Table 3: User Table

Field	Type	Null
Friendname	varchar(20)	No

3.3 Modular Design

3.4 User Login And Register

The Login Module allows users to enter a User Name and Password to log in. This module allow Existing users to login to the system. The new user can use the registration module to register their details and the user can login to the system. The new user can register their username, password along with the Profile Image.

3.5 Choosing Favourites

A user needs to manually specify the set of “close friends” among their social website friends with the button “Pick friends” as their neighbourhood. In this application, each user picks up to 30 “close friends”. All

the selected friends are required to install our application to carry out the collaborative training. The setup mode could be activated by pressing the button “Start”. Key operations and the data flow in this mode are enclosed by a yellow dashed box on the system architecture.

3.6 Sharing Photo

User can share a photo only to friends on list. According to the proposed scheme, by combining digital signature along with the shared image we can provide the data security for the image. The User can share the image combined with the steganography digital signature.

The digital includes owner name and the name of the Image. These information are piggy back into the Image, the image is called the stegano Image.

3.7 Steganography

Image steganography is the method of hiding secure information's behind the digital media like images. In the field of information secrecy it was the high authentic method. The advantage of steganography over cryptography alone is that the intended secret message does not attract attention to itself as an object of scrutiny in digital steganography, electronic communications may include steganography coding inside of a transport layer, such as a document file, image file, program or protocol. Media files are ideal for steganography transmission because of their large size.

Images typically use either 8-bit or 24-bit color. When using 8-bit color, there is a definition of up to 256 colors forming a palette for this image, each color denoted by an 8-bit value. A 24-bit color scheme, as the term suggests, Uses 24 bits per pixel and provides a much better set of colors. In this case, each pixel is represented by three

bytes, each byte representing the intensity of the three primary colors red, green, and blue (RGB).

The Least Significant Bit (LSB) steganography is one such technique in which least significant bit of the image is replaced with data bit.

3.9 Authenticating

In the Module of Authenticating is used when the data will be shared by one user than the steganography information's are predicted the user information data's are get from that particular user and also. User Acknowledgment will be send to the particular person if the person has accept the posting policy then it will be stored on to the consider persons. The Privacy policy will be decrypted from the image steganography after the owner information's are get from the particular user. The Acknowledgement for the privacy policy will be send to the particular image. After accepting the privacy policy by owner then only the photo is uploaded on the wall.

IV. SYSTEM IMPLEMENTATION

Implementation of software refers to the final installation of the package in its real environment, to the satisfaction of the intended users and the operation of the system. The people are not sure that the software is meant to make their job easier.

- The active user must be aware of the benefits of using the system
- Their confidence in the software built up
- Proper guidance is impaired to the user so that he is comfortable in using the application

Before going ahead and viewing the system, the user must know that for viewing the result, the server program should be running in the server. If the server object is not

running on the server, the actual processes will not take place.

V. Testing

Testing is the process used to help identify the correctness, completeness, security and quality of developed computer software. It is a process of technical investigation, performed on behalf of stake holders, that is intended to reveal quality related information about the product in which it is intended to operate.

The importance of software testing and its implications with respect to software quality cannot be overemphasized. Software testing is a critical quality of software quality assurance and represents the ultimate review of specification, design and implementation. In order to find the highest possible number of errors, tests must be conducted systematically and test cases must designed using disciplined techniques. The problem with software testing is that the number of defects in a software product can be very large, and the number of configurations of the product is larger still.

Bugs that occur infrequently are difficult to find in testing.

The rules that can serve well as testing objectives are :—

- Testing is a process of executing programs with the intent of finding an error.
- A good test case is one which has high probability of finding error.
- A successful test is one that uncovers an undiscovered error.

The program to be tested is executed with set of test data and the output of the program for the test data is evaluated to determine if the programs are performing as expected. A series of testing are performed

Table 4: Test Cases Conducted During the Login Check

S.No	Condition	Process/Output	Expected Output	Pass/Fail
1.	Login	(i) Unregistered username	(i) Username does not exist. (ii) Unfortunately app stopped	Pass Fail
		(ii) Wrong user name/ password	(i) Invalid username or Password (ii) Unfortunately app stopped	Pass Fail
		(iii) correct username	(i) Show the Welcome page (ii) Unfortunately app stopped	Pass Fail
2.	View Colleague list	(i) Retrieving data	(i) Display list (ii) Unfortunately app stopped	Pass Fail
3.	Share photo	Select friend name and attach image	Message Send	Pass
4.	Requests	Accept the request	Image viewed by third user	Pass

for the proposed system before the system is ready for user acceptance testing.

The testing steps are:—

- Unit Testing.
- Performance Testing.
- Integration Testing.
- White Box Testing.
- Black Box Testing
- Validation Testing.
- Output Testing.

5.1 Unit Testing

Unit testing is the testing of each module and the integration of the overall system is done. Unit testing becomes verification efforts on the smallest unit of software design in the module. This is also known as 'module testing'. The modules of the system are tested separately. This testing is carried out during the programming itself. In this testing step, each model is found to be working satisfactorily as regard to the expected output from the module. There are some validation checks for the fields. For example, the validation check is done for

verifying the data given by the user where both format and validity of the data entered is included. It is very easy to find error and debug the system.

Table 5.1 shows the test cases conducted during the login check. We can check the all cases for the test.

5.2 Performance Testing

This testing process is undertaken to check the performance and behavior of the application under certain conditions such as low battery, bad network coverage, low available memory, simultaneous access to application's server by several users and other conditions. Performance of an application can be affected from two sides: application's server side and client's side. Tests were conducted and performance verified.

5.3 Integration Testing

Data can be lost across an interface, one module can have an adverse effect on the other sub function, when combined, may not produce the desired major function. Integrated testing is systematic testing that

can be done with sample data. The need for the integrated test is to find the overall system performance. There are two types of integration testing. They are:

- i) Top-down integration testing.
- ii) Bottom-up integration testing.

5.4 White Box Testing

White Box testing is a test case design method that uses the control structure of the procedural design to drive cases. Using the white box testing methods, we derived test cases that guarantee that all independent paths within a module have been exercised at least once.

5.5 Black Box Testing

- Black box testing is done to find incorrect or missing function
- Interface error
- Errors in external database access
- Performance errors
- Initialization and termination errors

In 'functional testing', is performed to validate an application conforms to its specifications of correctly performs all its required functions. So this testing is also called 'black box testing'. It tests the external behavior of the system. Here the engineered product can be tested knowing the specified function that a product has been designed to perform, tests can be conducted to demonstrate that each function is fully operational.

5.6 Validation Testing

After the culmination of black box testing, software is completed assembly as a package, interfacing errors have been uncovered and corrected and final series of software validation tests begin validation testing can be defined as many, but a single

definition is that validation succeeds when the software functions in a manner that can be reasonably expected by the customer.

5.7 User acceptance Testing

User acceptance of the system is the key factor for the success of the system. The system under consideration is tested for user acceptance by constantly keeping in touch with prospective system at the time of developing changes whenever required.

5.8 Output Testing

After performing the validation testing, the next step is output asking the user about the format required testing of the proposed system, since no system could be useful if it does not produce the required output in the specific format. The output displayed or generated by the system under consideration. Here the output format is considered in two ways. One is screen and the other is printed format. The output format on the screen is found to be correct as the format was designed in the system phase according to the user needs. For the hard copy also output comes out as the specified requirements by the user. Hence the output testing does not result in any connection in the system.

VI. RESULT

6.1 Login Page

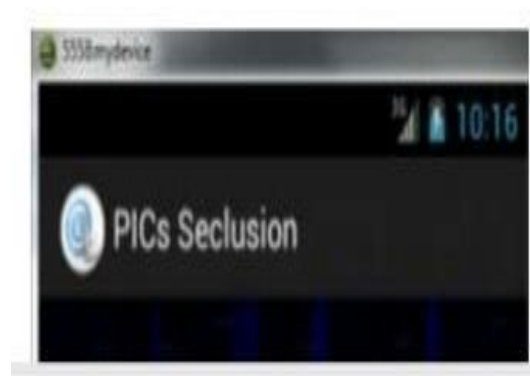


Figure 5: Login page

The Figure 5 shows the login page in that the Existing user can login to the application. If the new user wants to login, the user need to register their details. After registration the user can login into the application.

6.2 Registration



Figure 6: Registration

The Figure 6 shows registration page. The new user register his details like name, username, password and profile photo. The username must be unique.

6.3 Homepage



Figure 7: Home page

The Figure 7 show the home page of the application. After the user login into the application, the home page displayed with the friends, Add friends, requests, new message, view message icons.

6.4 Friend List



Figure 8: Friend List

The Figure 8 Show the friend list, It displays the list friends from that we can select our favourite. They are added into to our Colleague list.

6.5 Create New Message

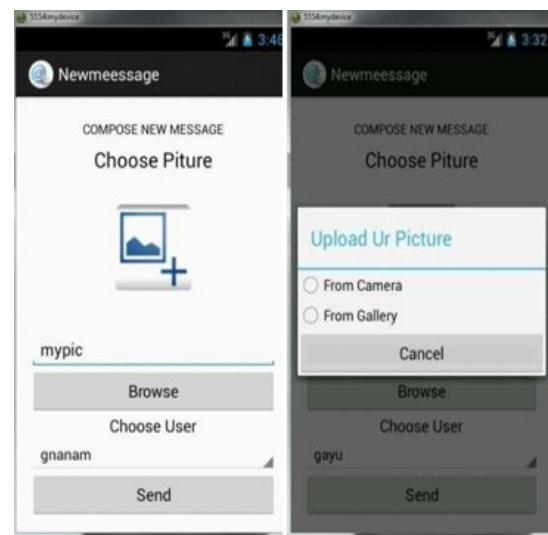


Figure 9: New Message

The Figure 9 shows that how the new message has been created in the application. The user can attach the image and type the message that want to send. They need to send user whom they want to send that message. After select the receiver they can proceed to send that message.

6.6 View Message

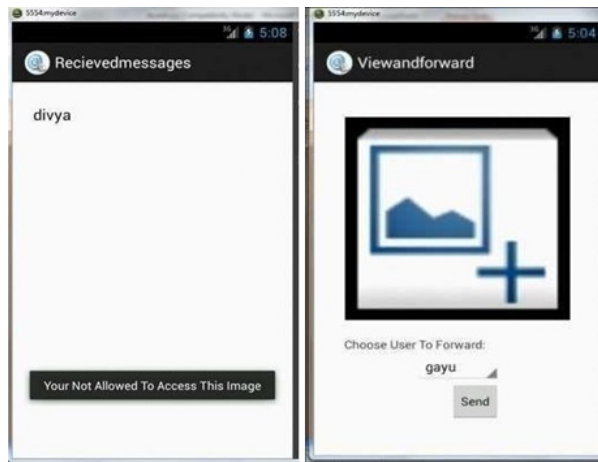


Figure 10 View message

The Figure 10 shows the received message, the image can also be forward to another user. While sharing a request will be send to the owner of the photo after the owner accept the request the user can view the Image.

6.7 Requests

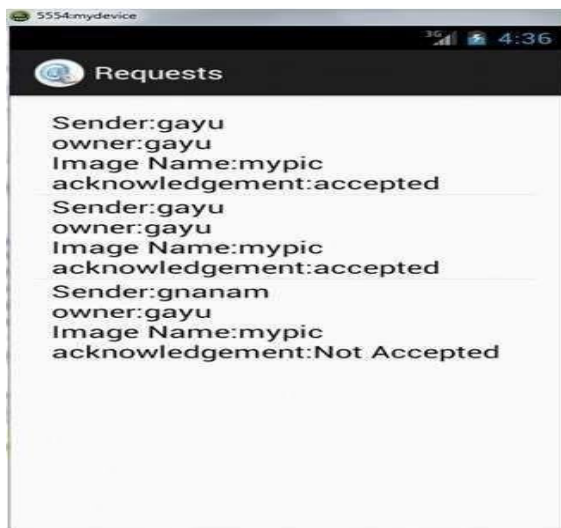


Figure 11: Requests

The Figure 11 Shows the request received to the user are viewed in the request. The image can also be forward to another user. While sharing a request will be send to the owner of the photo after the owner accept the request the user can view the Image.

VII. CONCLUSION

The system proposed here is by combining digital signature along with the shared image to provide data security for the image. The User can share the image combined with the steganography digital signature. If any other user wants to share that image, the permission request is automatically redirected to the user and if the owner shares the privilege to share the data, then it will be posted. Photo sharing is the publishing or transfer of a user's digital photos online. Photo-sharing websites offer services such as uploading, hosting, managing and sharing of photos (publicly or privately). The proposed system prevents the possible privacy leakages of photos shared through websites and is a viable option for general public to keep their data safe on the web.

VIII. FUTURE WORK

The term can also be loosely applied to the use of online photo galleries that are set up and managed by individual users, including photo blogs. Sharing means that other users can view but not necessarily download the photos, users being able to select different copyright options for their photos. Firstly, each user performs local supervised learning only with its own training set, and then the local results are exchanged among collaborators to form a global knowledge. Then the global knowledge is used to regularize the local training until convergence. The system used a toy system with two users to demonstrate the principle of our design. Then, the system has proven that how to build a general personal FR with more than two users. It is very efficient than existing system. The system can curb the privacy leakage by using this design.

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