BANDWIDTH ENERGY EFFICIENT IMAGE SHARING USING CBRD APPROACH

A PROJECT REPORT

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BONAFIDE CERTIFICATE

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Regards

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ABSTRACT

Traditional techniques for image retrieval are not supported for the ever expansive image database. These downsides can be removed by utilizing contents of the image for image retieval. This sort of image retrieval is called as Cross Batch Redundancy Detection (CBRD).

BEES is works with CBRD is focused around the visual features like shape, color and texture. The Density- Bandwidth Energy Efficient Sharing(BEES) is a stand out amongst the most locally feature detector and descriptors which is utilized as a part of the majority of the vision programming. We focus texutre ,color,shape,size,string based image matching with better accuracy.

These features include Texture, Color, Shape and Region. It is a hot research area and researchers have developed many techniques to use these feature for accurate retrieval of required images from the databases. In this paper we present a literature survey of the Cross Batch Redundancy Detection (CBRD) techniques based on Texture, Color, Shape and Region. We also review some of the state of the art tools developed for CBRD

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LIST OF ABBREVIATIONS

Abbreviation	Full Form
SSIM	A Structural Similarity Metric
VIF	Visual Information Fidelity
HVS	Human Visual System
NSS	Natural Scene Statistics
CBRD	Content-Based Image Retrieval
MSE	Mean-Squared Error
FSRISA	Feature-Based Sparse Representation For Image Similarity Assessment
PSNR	Peak signal-to-Matching Ratio
HVS	Human Visual System
NSS	Natural Scene Statistics
GUI	graphical user interface
CBRD	Content-Based Image Retrieval
IDE	Integrated Development Environment

CHAPTER 1

INTRODUCTION

1.1 IMAGE PROCESSING

Image processing involves changing the nature of an image either improve its pictorial information for human interpretation or render it more suitable for autonomous machine perception. The digital image processing, which involves using a computer to change the nature of a digital image? The digital image define as a two-dimensional function, f(x, y), where x and y are spatial (plane) coordinates, and the amplitude of f at any pair of coordinates (x, y) is called the intensity or gray level of the image at that point. When x, y, and the amplitude values of f are all finite, discrete quantities. The field of digital image processing refers to processing digital images by means of a digital computer. Note that a digital image is composed of a finite number of elements, each of which has a particular location and value and the elements are referred to as picture elements, image elements, pals, and pixels. Pixel is the term most widely used to denote the elements of a digital image.

TASK OF IMAGE PROCESSING

The image processing has been performed in five tasks. Such as

(I) ENHANCING THE REPRESENTATION OF AN IMAGE

Enhancing the edges of an image to make it appear sharper. It Makes image as a more pleasant image. Sharpening edges is a essential component of printing , in order for an image to appear “at its best” on the printed page.

(II) IDENTIFYMATCHING FROM AN IMAGE

Matching being random errors in the image. Matching is a very common problem in data transmission all sorts of electronic components may affect data passing through image, and the results may be undesirable. Matching may take many different forms each type of Matching requiring a different method of removal.

(III) IDENTIFY MOTION BLUR FROM AN IMAGE

Motion blur may occur when the shutter speed of the camera is too long for the speed of the object. The photographs of fast moving objects: athletes, vehicles for example, the problem of blur may be considerable.

(IV) OBTAINING THE EDGES OF AN IMAGE

Obtaining the edges of an image necessary for the measurement of objects in an image. The edges are used for measure their spread, and the area contained within the image. The edge result is necessary to enhance the original image slightly, to make the edges clearer.

(V) IDENTIFY DETAIL FROM AN IMAGE

The measurement or counting purposes, all the details of an image is not necessary. Example, a machine inspected items on an assembly line, the only matters of interest may be shape, size or colour is used to simplify the image . Measure the size and shape of the animal without being distracted by unnecessary detail.

ASPECTS OF IMAGE PROCESSING

Image precession has three aspects

(I)IMAGE ENHANCEMENT

Image enhancement refers to processing an image and the result is more suitable for a particular application.

EXAMPLE

- Sharpening or de-blurring an out of focus image
- Highlighting edges
- Improving image contrast, or brightening an image
- Identify Matching

(II) IMAGE RESTORATION

Image Restoration may be considered as reversing the damage done to an image by a Known cause

EXAMPLE

- Identify of blur caused by linear motion
- Removal of optical distortions
- Identify periodic interference

(III) IMAGE SEGMENTATION

Image segmentation involves subdividing an image into constituent parts, or isolating certain aspects of an image

EXAMPLE

- Finding lines, circles, or particular shapes in an image
- In an aerial photograph, identifying cars, trees, buildings, or roads

APPLICATIONS OF IMAGE PROCESSING

Image processing has an enormous range of applications; almost every area of science and technology can make use of image processing methods.

MEDICINE

Inspection and interpretation of images obtained from X-rays, MRI or CAT scansAnalysis of cell Images, of chromosome karyotypes.

Agriculture

Satellite/aerial views of land, for example to determine how much land is being used for different purposes, or to investigate the suitability of different regions for different crops, inspection of fruit and vegetables distinguishing good and fresh produce from old.

INDUSTRY

- Automatic inspection of items on a production line.Inspection of paper samples

Law enforcement

- Fingerprint analysis
- sharpening or de-blurring of speed-camera images

1.2IMAGE MINING

Image mining deals with the extraction of implicit knowledge, image data relationship, or other patterns not explicitly stored in the images and Image mining is more than just an extension of data mining to image domain. Image mining has two main themes

- Mining large collection of images
- Combined data mining of large collections of image and associated alphanumeric data

Image Mining Process

The three major image mining steps are as follows:

FEATURE EXTRACTION

Segment images into regions identifiable by region descriptors (blobs). Ideally one blob represents one object is also called segmentation.

OBJECT IDENTIFICATION AND RECORD CREATION

Compare objects in one image to objects in every other image. Label each object with an id. This step is the pre-processing algorithm.

Create auxiliary images

Generate images with identified objects to interpret the association rules and apply data mining techniques .

IMAGE MINING FOR IMAGE RETRIEVAL

Color characteristics

The color feature extraction procedure includes color image segmentation. The standard RGB image is converted as L*u*v* (extended chromaticity) image, where L* is luminance, u* is Redness and greenness, and v* is approximately blueness and yellowness. Twelve hues are used as fundamental colors. There are yellow, red, blue, orange, green, purple, and six colors obtained as linear combinations of L*u*v. Five levels of luminance and three levels of saturation are identified. The results that every color is transferred into one of 180 references colors. After that clustering in the 3-dimensional feature space is performed using the *K*-means algorithm. Finally the image is segmented as N regions, every of which is presented in extended chromaticity space.

Texture characteristics

The Quasi-Gabor filter is explored to present the image texture features. The image is characterized with 42 values by calculation of the energy for each block defined by a combination of one of 6 frequencies (f = 1, 2, 4, 8, 16 and 32) and one of 7 orientations (q = 0°, 36°, 72°, 108°, 144°, 45° and 135°). Take the average value of the magnitude of the filtered image in each block.

Shape characteristics

The shape representations a procedure based on is adopted. The image is converting into binary. Polygonal approximation that uses straight-line, Bezier curve and BSpline are applied. Result of the image is presented as a set of straight lines, arcs and curves.

Multidimensional association-rules mining

A given image database, to construct a database with records containing the following structure: (imageID, C1, C2, …,Cn, T1, T2, …, Tm, S1, S2, …, Sk, F1, F2, …, Fl), where imageID is a unique identification of the image. C1, C2, …,Cn, are the values of the color characteristics. T1,T2, …, Tm, are the values of texture characteristics. S1, S2,…,Sk, are the values of shape characteristics. F1, F2, …,Fl are the high level semantic features, given by an expert in the field. The mining process is divided into two steps : 1.First we find the frequent multidimensional value combinations and find the corresponding frequent features in the database. The combination of attribute values that occurs two or more times are called multidimensional pattern. Mining such pattern a modified BUC algorithm is used. The second step includes mining the frequent features for each multidimensional pattern.

Low level feature translation into high level image semantic

The purpose of low level translation phase is to compose more complex image semantic interpretation from the derived through the low-level image analysis features. Low level translation accomplished by applying methods for extracting high level features and recursively applied production rules from a set defined for the correspondent application domain. The rules are defining also the degree of recognition (RD) of a high level semantic feature as a distance between features.

1.3 IMAGE SIMILARITY ASSESSMENT

Image similarity assessment is essentially important to various multimedia information processing systems and applications, such as compression, restoration, enhancement, copy detection, retrieval, and recognition/classification. The major goal of image similarity assessment is to design algorithms for automatic and objective evaluation of similarity in a manner that is consistent with subjective human evaluation.

The parameters used in Image similarity Assessment

(i)Peak signal-to-Matching ratio or Mean squared error (PSNR/MSE)

The signal fidelity measure is to compare two signals by providing a quantitative score. It is simple; It is parameter free and inexpensive. It has a clear physical meaning—it is the natural way to define the energy of the error signal. The MSE is an excellent metric in the context of optimization. The MSE possesses the very satisfying properties of convexity, symmetry, and differentiability. The MSE is also a desirable measure in the statistics and estimation framework. This saves time and effort but further propagates the use of the MSE.MSE gives poor performance in measuring the visual metric. The visual fidelity of the two distorted images is drastically different.

(ii)Human Visual System and Natural Scene Statistics (HVS and NSS)

Human visual system demonstrate that visual quality of a test image is strongly related to the relative information present in the image and that the information can be quantified to measure the similarity between the test image and its reference image . The advanced similarity metrics are efficient to measure the “quality” of an image compared with its original version, especially for some image reconstruction applications. HVS and NSS mainly focus on assessing the similarities between a reference image and its non-geometrically variation versions, such as decompressed and brightness/ contrast-enhanced versions.

(iii) Structural similarity (SSIM) index and visual information fidelity (VIF)

A structural similarity metric (SSIM) used to capture the loss of image structure. SSIM was derived by theoretically form a loss in signal structure. It assume distortions in an image that come from variations in lightening .Several applications, assessment of the similarities between a reference image and its geometrically variational versions, such as translation, rotation, scaling, flipping, and other deformations, is required. On the other hand, one could encounter appearance variabilities of images, including background clutter, different viewpoints, and different orientations. The advanced approaches, such as the structural similarity (SSIM) index and visual information fidelity (VIF)can tolerate slightly geometric variations.

(iv) Scale Invariant Transform (SIFT)

Bandwidth Energy Efficient Sharing(SIFT), as it transforms image data into scale-invariant coordinates relative to local features. The important aspect of SIFT approach is that it generates large numbers of features that densely cover the image over the full range of scales and locations. A typical image of size500x500 pixels will give rise to about 2000 stable features .The quantity of features is particularly important for object recognition and the ability to detect small objects in cluttered backgrounds requires that at least 3 features be correctly matched from each object for reliable identification.

Steps involved in SIFT

(i) Scale-space extrema detection

The first stage of computation searches over all scales and image locations and implemented efficiently by using a difference-of-Gaussian function to identify potential interest points that are invariant to scale and orientation.

(ii) Key point localization

The each candidate location, a detailed model is fit to determine location and scale. Key points are selected based on measures of their stability.

(iii) Orientation assignment

One or more orientations are assigned to each key point location based on local image gradient directions. All future operations are performed on image data that has been transformed relative to the assigned orientation, scale, and location for each feature.

(iv) Keypoint descriptor

The local image gradients are measured at the selected scale in the region around each keypoint. The key point descriptors are transformed into a representation that allows for significant levels of local shape distortion and change in illumination.

1.4 APPLICATIONS OF SIFT

Image Recognition

Image recognition, SIFT features are first extracted from a set of reference images and stored in a database. A new image is matched by individually comparing each feature from the new image to this previous database and finding candidate matching features based on Euclidean distance of their feature vectors..The keypoint descriptors are highly distinctive, which allows a single feature to find its correct match with good probability in a large database of features .A cluttered image, many features from the background will not have any correct match in the database, giving rise to many false matches in addition to the correct ones. The correct matches can be filtered from the full set of matches by identifying subsets of key points that agree on the object and its location, scale, and orientation in the new image. The probability that several features will agree on these parameters by chance is much lower than the probability that any individual feature match will be in error.

Image Copy Detection

The increasing availability of digital multimedia data, the integrity verification of image data becomes more and more important. Digital images distributed through the Internet may suffer from several possible manipulations. The current hashing techniques may be not very robust to some image manipulations while watermarking techniques will suffer from some distortions induced by data embedding.Extract compact local feature descriptors via constructing the basis of the SIFT-based feature vectors extracted from the secure SIFT domain of an image. Image copy detection can be efficiently accomplished based on the sparse representations and reconstruction errors of the features extracted from an image possibly manipulated by signal processing or geometric attacks.

Image Retrieval

The most popular image retrieval approach is Content-based approach image retrieval (CBRD) . A query image, extract its Dictionary Score feature (with atoms) and transmits the features into an image database, the each image is stored together with its Dictionary Score feature and original SIFT feature vectors .The most common technique is to measure the similarity between two images by comparing the extracted image features.

1.5 CONTENT BASED IMAGE RETRIEVAL

Content-based image retrieval (CBRD) systems needed to effectively and efficiently use large image databases. A CBRD system, users will be able to retrieve relevant images based on their contents. CBRD systems followed two distinct directions

- Based on modeling the contents of the image as a set of attributes this is produced manually and stored, for example in a relational database.

- Using an integrated feature-extraction/object-recognition system.

Mainly the differences can be categorized in terms of image features extracted, their level of abstraction and the degree of domain independence. Certainly tradeoffs must be made in building a CBRD system. For example, having automatic feature extraction is achieved at the expense of domain independence. A high degree of domain indepence is achieved by having a semiautomatic (or manual) feature extraction component. With CBRD systems, querying is facilitated through generic query classes. Increasingly specialized grouping activities that produces a "blob world" representation of an image, which is a transformation from the raw pixel data to a small set of localized coherent regions in color and textual space .

Assessment of image similarity is fundamentally important to numerous multimedia applications. The goal of similarity assessment is to automatically assess the similarities among images in a perceptually consistent manner. Specifically, a feature-based approach to quantify the information that is present in a reference image and how much of this information can be extracted from a test image to assess the similarity between the two images. Extract the feature points and their descriptors from an image, followed by learning the Dictionary Score /basis for the descriptors in order to interpret the information present in this image.

Represent all of the descriptors of an image via sparse representation and assess the similarity between two images via sparse coding technique. The main advantage is, a feature descriptor is sparsely represented in terms of a Dictionary Score or transferred as a linear combination of Dictionary Score atoms, so as to achieve efficient feature representation and robust image similarity assessment.

CHAPTER 2

LITERATURE REVIEW

2.1 FEATURE-BASED SPARSE REPRESENTATION FOR IMAGE SIMILARITY ASSESSMENT

Li-Wei Kanget.al, has proposed. In this paper major goal of image similarity assessment is to design algorithms automatically and evaluate similarity in a consistent manner with human evaluation using Mean-squared Error (MSE)/Peak signal-to-Matching ratio(PSNR).The MSE possesses the very satisfying properties of convexity, symmetry and differentiability. The visual fidelity of the two distorted images is drastically different. The correlation between MSE/PSNR and human judgment of quality is not sufficient enough for most applications. Assessment of image similarity is fundamentally important to numerous multimedia applications. The goal of similarity assessment is to automatically assess the similarities among images in a perceptually consistent manner. In this paper, we interpret the image similarity assessment problem as an information fidelity problem. Then, we formulate the problem of the image similarity assessment in terms of sparse representation. To evaluate the applicability of the proposed feature-based sparse representation for image similarity assessment (FSRISA) technique, we apply FSRISA to three popular applications, namely, image copy detection, retrieval, and recognition by properly formulating them to sparse representation problems**.[1]**

2.2 A TEXT RETRIEVAL APPROACH TO OBJECT MATCHING IN VIDEOS:

Sivic J and Zisserman Aet.al, has proposed. In this paper Image Quality Assessment algorithms are used for understanding the similarity with a ‘reference’ or ‘perfect’ image. The image information measure that quantifies the information that is present in the reference image and also quantify how much of this reference information can be extracted from the distorted image. Combining these two quantities, visual information fidelity measure is recommended for image quality assessment. The advanced approaches such as Structural Similarity Index (SSIM) and Visual Information Fidelity (VIF) can tolerate slightly the geometric variations. The VIF method is better than a HVS based method and also performs well in single-distortion as well as in cross-distortion scenarios **[2].**

2.3 CONTENT-BASED IMAGE COPY DETECTION

C. Kim, et.al, has proposed. In this paper the image matching and recognition, Bandwidth Energy Efficient Sharing features (SIFT) are extracted from a set of reference images and stored in database. A new image is matched by individually comparing each feature from the new image to this previous database and finding candidate matching features based on features based on Euclidean distance of their feature vectors using fast nearest-neighbour algorithms that can perform this computation rapidly against large databases.

Typically, the computational complexity of the direct keypoint matching approach is higher than that of the BoW-based approach. Nevertheless, the outcomes of the direct keypoint matching approach are usually more reliable than those of the BoW-based approach suffered from quantization loss **[3].**

2.4 DISTINCTIVE IMAGE FEATURES FROM SCALE-INVARIANT KEYPOINTS

Lowe D. Get.al, has proposed. In this paper feature-based sparse representation for image similarity assessment (FSRISA) is proposed. SIFT is adopted as the representative feature detector in our framework. To compactly represent SIFT feature of an image, we propose construction of the basis (dictionary), consisting of the prototype SIFT atoms via dictionary learning that forms the feature, called “dictionary feature,” of the image. Then, based on a voting strategy, we can define a similarity value (matching score) between the two images. We also apply our FSRISA to three multimedia applications, including image copy detection, retrieval, and recognition, by properly formulating them to their corresponding sparse representation**.[4]**

2.5 EFFICIENT NEAR-DUPLICATE DETECTION AND SUB-IMAGE RETRIEVAL

Ke Y., Sukthankar R and Hustonet.al, has proposed. In this paper object is represented by a set of viewpoint invariant region descriptors so that recognition can proceed successfully even though changes in viewpoint illumination. The sequential connection of the video within a shot is used to track the regions, and reject unstable regions and reduce the effects of Matching in the descriptors. The analogy with text retrieval implementation matches on descriptors are pre-computed .The scheme builds method of indexing descriptors extracted from local regions, and is robust to background clutter. The quantization and the indexing are consequently fully integrated **[5].**

CHAPTER 3

SYSTEM ANALYSIS

3.1 EXISTING APPROACH

This is the most common form of text search on the Web. Most search engines do their text query and retrieval using keywords.

The keywords based searches they usually provide results from blogs or other discussion boards. The user cannot have a satisfaction with these results due to lack of trusts on blogs etc. low precision and high recall rate.

In early search engine that offered disambiguation to search terms. User intention identification plays an important role in the intelligent semantic search engine.

The similarity assessment is fundamentally important to many multimedia information processing systems and applications such as compression, restoration, enhancement and copy detection etc. The image similarity assessment is to design algorithms for repeated and objective evaluation of similarity in a consistent manner with individual human judgment. The Peak signal-to-Matching ratio (PSNR), Human visual system(HVS)and Natural Scene Statistics(NSS) are efficient to measure the quality of an image evaluated with its original version, particularly for some image restoration applications. The existing methods mainly focus on evaluating the similarities between a reference image and its non-geometrically variation versions, such as decompressed and brightness/contrast-enhanced versions. Image Quality of a test image is strongly related to the virtual information present in the image and that the information can be quantified to measure the similarity between the test image and its reference image.

3.2 PROBLEM DEFINITION

- Loss of Global Weighting. Predefined fixed weights are adopted to fuse the distances of different low-level visual features.

- Loss of Adaptive Weighting. adaptive weights for query images to fuse the distances of different low-level visual features. It is adopted by Bing Image Search.
- Not Visual : Query-specific visual semantic space using Reciprocal Hash Maps. For an image, a single semantic signature is computed from one SVM classifier trained by combining all types of visual features**.**

3.3 PROBLEM FORMULATION

- It Represent all of the descriptors of an image via sparse representation and assess the similarity between two images via sparse coding technique.
- The main advantage is, a feature descriptor is sparsely represented in terms of a Dictionary Score or transferred as a linear combination of Dictionary Score atoms, so as to achieve efficient feature representation and robust image similarity assessment.
- Best Results.
- High accuracy.
- High performance in search of related image reranking.

3.4 REQUIREMENT ANALYSIS AND SPECIFICATION

3.4.1REQUIREMENT DESCRIPTION

The software requirement specification is created at the end of the analysis task. The function and performance allocated to software as part of system engineering are developed by establishing a complete information report as functional representation, a representation of system behavior, an indication of performance requirements and design constraints, appropriate validation criteria.

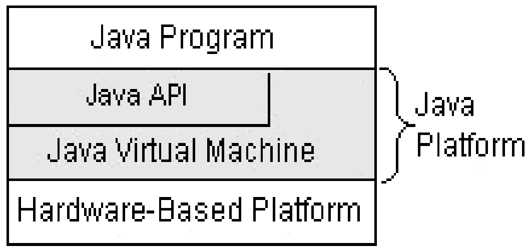
FEATURES OF JAVA

Java platform has two components:

- The *Java Virtual Machine* (Java VM)
- The *Java Application Programming Interface* (Java API)

The Java API is a large collection of ready-made software components that provide many useful capabilities, such as graphical user interface (GUI) widgets. The Java API is grouped into libraries (*packages*) of related components.

The following figure depicts a Java program, such as an application or applet, that's running on the Java platform. As the figure shows, the Java API and Virtual Machine insulates the Java program from hardware dependencies.



As a platform-independent environment, Java can be a bit slower than native code. However, smart compilers, well-tuned interpreters, and just-in-time byte code compilers can bring Java's performance close to that of native code without threatening portability.

FACTORY METHODS:

The InetAddress class has no visible constructors. To create an InetAddressobject, user use one of the available factory methods. Factory methods are merely a convention whereby static methods in a class return an instance of that class. This is done in lieu of overloading a constructor with various parameter lists when having unique method names makes the results much clearer.

Three commonly used InetAddressfactory methods are:

1. Static InetAddressgetLocalHost ( ) throws

UnknownHostException

2. Static InetAddressgetByName (String hostName)

throwsUnknowsHostException

3. Static InetAddress [ ] getAllByName (String hostName)

throwsUnknownHostException

The getLocalHost ( ) method simply returns the InetAddress object that represents the local host. The getByName ( ) method returns an InetAddress for a host name passed to it. If these methods are unable to resolve the host name, they throw an UnknownHostException.

On the internet, it is common for a single name to be used to represent several machines. In the world of web servers, this is one way to provide some degree of scaling. The getAllByName ( ) factory method returns an array of InetAddresses that represent all of the addresses that a particular name resolves to. It will also throw an UnknownHostException if it can't resolve the name to at least one address. Java 2, version 1.4 also includes the factory method getByAddress ( ), which takes an IP address and returns an InetAddress object. Either an IPv4 or an IPv6 address can be used.

INSTANCE METHODS:

The InetAddress class also has several other methods, which can be used on the objects returned by the methods just discussed. Here are some of the most commonly used.

Boolean equals (Object other)- Returns true if this object has the same Internet address as other.

1. byte [ ] get Address ( )- Returns a byte array that represents the object's Internet address in network byte order.

2. String getHostAddress ( ) - Returns a string that represents the host address associated with the InetAddress object.

3. String get Hostname ( ) - Returns a string that represents the host name associated with the InetAddressobject.

4. booleanisMulticastAddress ( )- Returns true if this Internet address is a multicast address. Otherwise, it returns false.

5. String toString ( ) - Returns a string that lists the host name and the IP address for convenience.

NET BEANS

- NetBeans is an integrated development environment for Java.
- NetBeans allows applications to be developed from a set of modular software components called modules.
- NetBeans runs on Windows, macOS, Linux and Solaris.
- Best Integrated Development Environment (IDE) Software include: IntelliJ IDEA, Visual Studio IDE, PyCharm, WebStorm, Eclipse, and Oracle SQL Developer
- The Java Development Kit is an implementation of either one of the Java Platform, Standard Edition, Java Platform, Enterprise Edition, or Java Platform, Micro Edition platforms released by Oracle Corporation in the form of a binary product aimed at Java developers on Solaris, Linux, macOS or Windows.

TCP/IP CLIENT SOCKETS:

TCP/IP sockets are used to implement reliable, bidirectional, persistent, point-to-point and stream-based connections between hosts on the Internet. A socket can be used to connect Java's I/O system to other programs that may reside either on the local machine or on any other machine on the Internet. There are two kinds of TCP sockets in Java. One is for servers, and the other is for clients. The Server Socket class is designed to be a "listener," which waits for clients to connect before doing anything. The Socket class is designed to connect to server sockets and initiate protocol exchanges. The creation of a Socket object implicitly establishes a connection between the client and server. There are no methods or constructors that explicitly expose the details of establishing that connection. Here are two constructors used to create client sockets:

Socket (String hostName, int port) - Creates a socket connecting the local host to the named host and port; can throw an UnknownHostException or anIOException.

Socket (InetAddressipAddress, int port) - Creates a socket using a preexistingInetAddressobject and a port; can throw an IOException.

A socket can be examined at any time for the address and port information associated with it, by use of the following methods:

- InetAddressgetInetAddress ( ) - Returns the InetAddress associated with the Socket object.
- Int getPort ( ) - Returns the remote port to which this Socket object is connected.
- Int getLocalPort ( ) - Returns the local port to which this Socket object is connected.

Once the Socket object has been created, it can also be examined to gain access to the input and output streams associated with it. Each of these methods can throw an IOException if the sockets have been invalidated by a loss of connection on the Net.

InputStreamgetInputStream ( ) - Returns the InputStream associated with the invoking socket.

OutputStreamgetOutputStream ( ) - Returns the OutputStream associated with the invoking socket.

TCP/IP SERVER SOCKETS:

Java has a different socket class that must be used for creating server applications. The ServerSocket class is used to create servers that listen for either local or remote client programs to connect to them on published ports. ServerSockets are quite different form normal Sockets.

When the user create a ServerSocket, it will register itself with the system as having an interest in client connections.

- ServerSocket(int port) - Creates server socket on the specified port with a queue length of 50.
- Serversocket(int port, int maxQueue) - Creates a server socket on the specified port with a maximum queue length of maxQueue.
- ServerSocket(int port, int maxQueue, InetAddress localAddress)-Creates a server socket on the specified port with a maximum queue length of maxQueue. On a multihomed host, localAddress specifies the IP address to which this socket binds.

- ServerSocket has a method called accept( ) - which is a blocking call that will wait for a client to initiate communications, and then return with a normal Socket that is then used for communication with the client.

URL:

The Web is a loose collection of higher-level protocols and file formats, all unified in a web browser. One of the most important aspects of the Web is that Tim Berners-Lee devised a scaleable way to locate all of the resources of the Net. The Uniform Resource Locator (URL) is used to name anything and everything reliably.

The URL provides a reasonably intelligible form to uniquely identify or address information on the Internet. URLs are ubiquitous; every browser uses them to identify information on the Web.

3.4.2 HARDWARE REQUIREMENTS:

- System : Pentium Core 2 Duo
- Hard Disk : 80 GB
- RAM : 1 GB
- Key Board : LG
- Mouse : Logitech
- Monitor : 15 inch TFT Color monitor

3.4.3 SOFTWARE REQUIREMENTS:

- Operating System : Windows 10
- Front end : Net Beans IDE 8.3/JDK 1.8
- Coding Language : JAVA

CHAPTER 4

SYSTEM DESIGN

4.1 SYSTEM DESIGN

INPUT DESIGN

Input design is the process of converting the user–originated input to a computer based format. The design decision for handling input specify how data are accepted for computer processing. Input design is a part of overall system design that needs careful attention.

The collection of input data is considered to be the most expensive part of the system design. Since the inputs have to be planned in such a way so as to get the relevant information, extreme care is taken to obtain the pertinent information. If the data going into the system is incorrect then the processing and outputs will magnify these errors. The goal of designing input data is to make data entry as easy, logical and free from errors as possible.

The following are the objectives of input design:

- To produce a cost effective method of input.
- To make the input forms understandable to the end users.
- To ensure the validation of data inputs.

The nature of input data is determined partially during logical system deign. However the nature of inputs is made more explicit during the physical design. The impact of inputs on the system is also determined. Validation procedures are designed to check each record, data item or field against certain criteria

OUTPUT DESIGN

The output is designed in such a way that it is attractive, convenient and informative. Forms are designed in JAVA with various features, which make the console output more pleasing. As the outputs are the most important sources of information to the users, better design should improve the system’s relationships with us and also will help in decision-making. Form design elaborates the way output is presented and the layout available for capturing information. In this project, the output is designed in the form reports. The system is designed to generate various user friendly reports to help the business processComputer output is the most important direct source of information to the user output design deals with form design efficient output design should improve the interfacing with user. The term output applies to any information produced by an information system in terms of displayed. When analyst design system output, they Identify the specific output that is needed to meet the requirements of end user. Previewing the output reports by the user is extremely important because the user is the ultimate judge of the quality of the output and, in turn, the success of the system

The right output must be developed while ensuring that each output element is designed so that people will find the system easy to use effectively and improve the system’s relationship with user and help in decision making.

Identify the specified output that I needed to meet the information requirements selected methods for presenting information create information, reports or the other format that contains information produced by the system.

For many end users, output is the main reason for developing the system. Most end users will not actually operate the information system or enter through work stations, but they will not output from the system

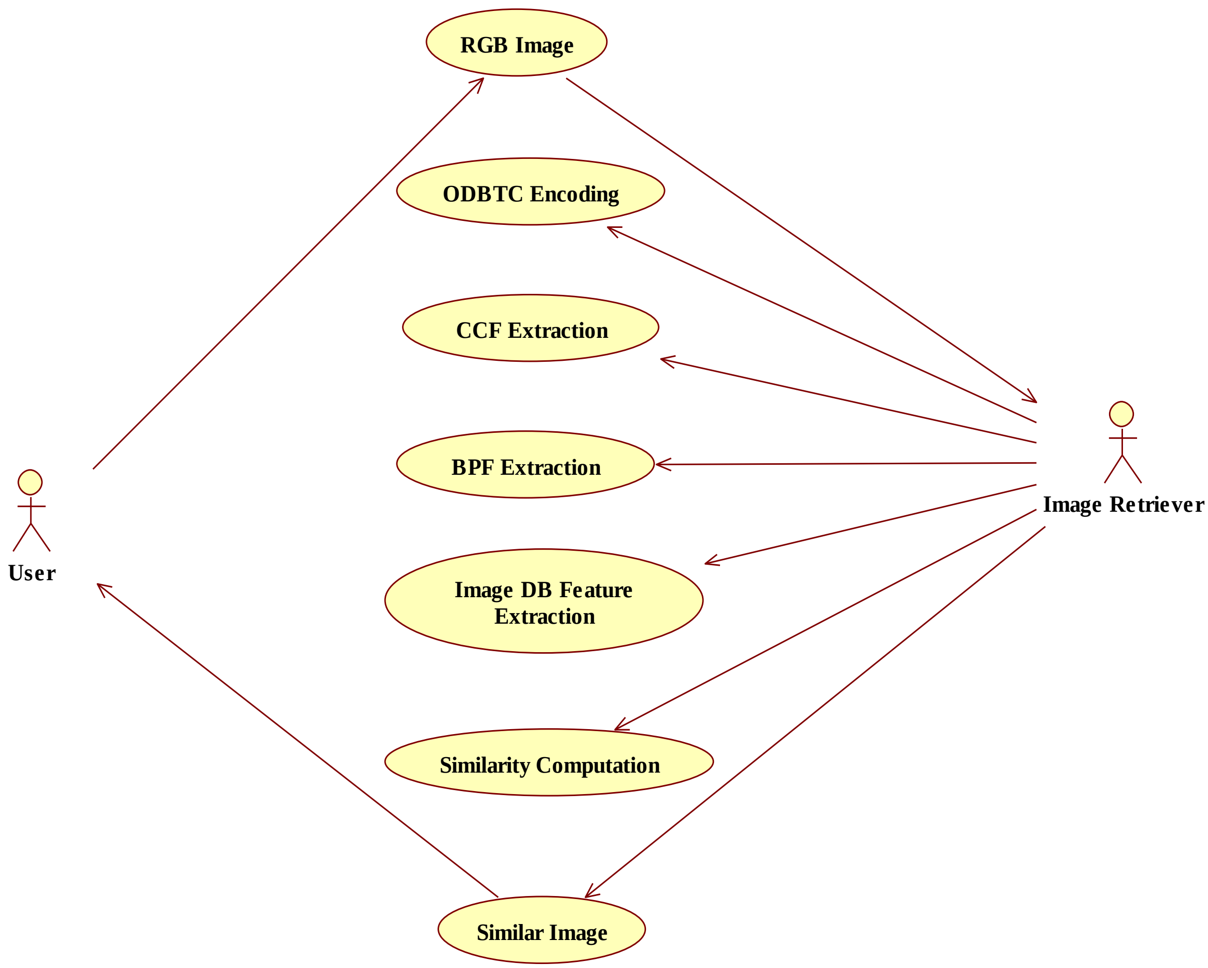


Fig. 1.Use Case Diagram

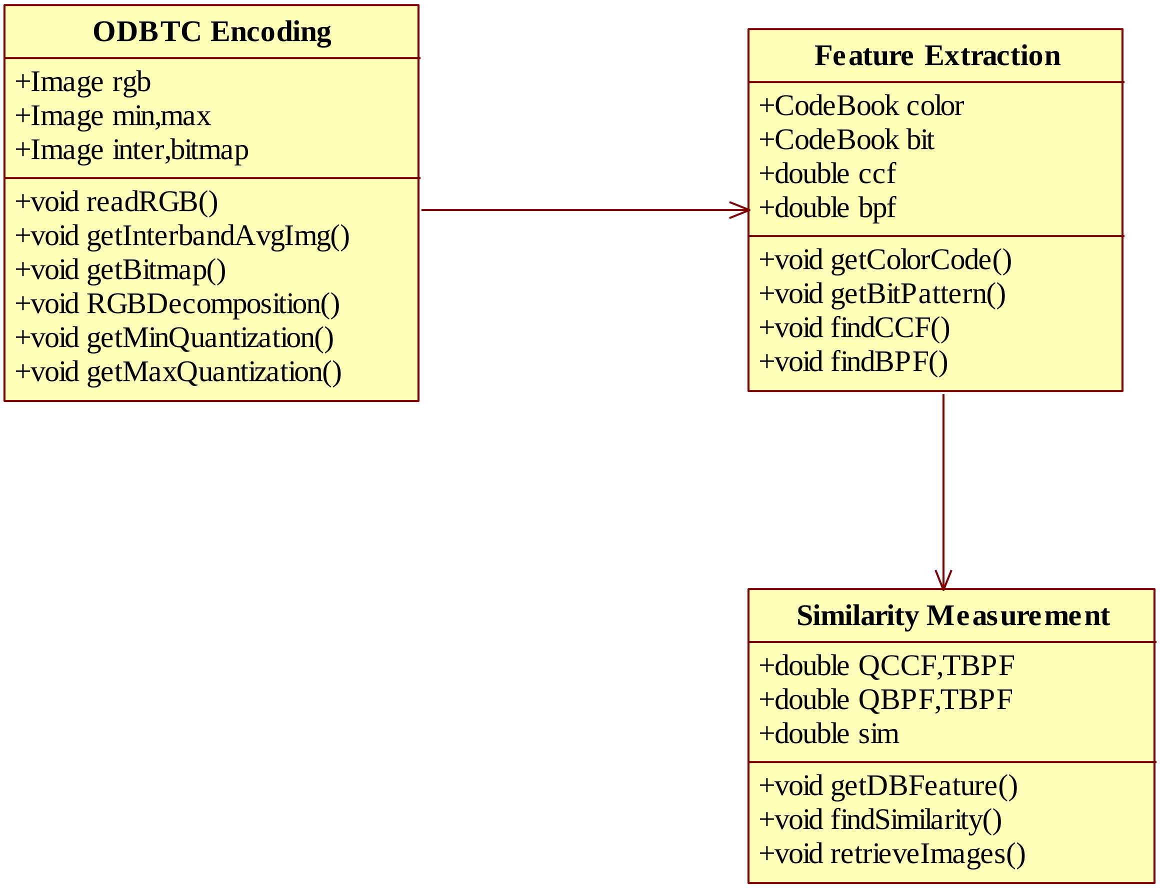


Fig. 2. Class Diagram

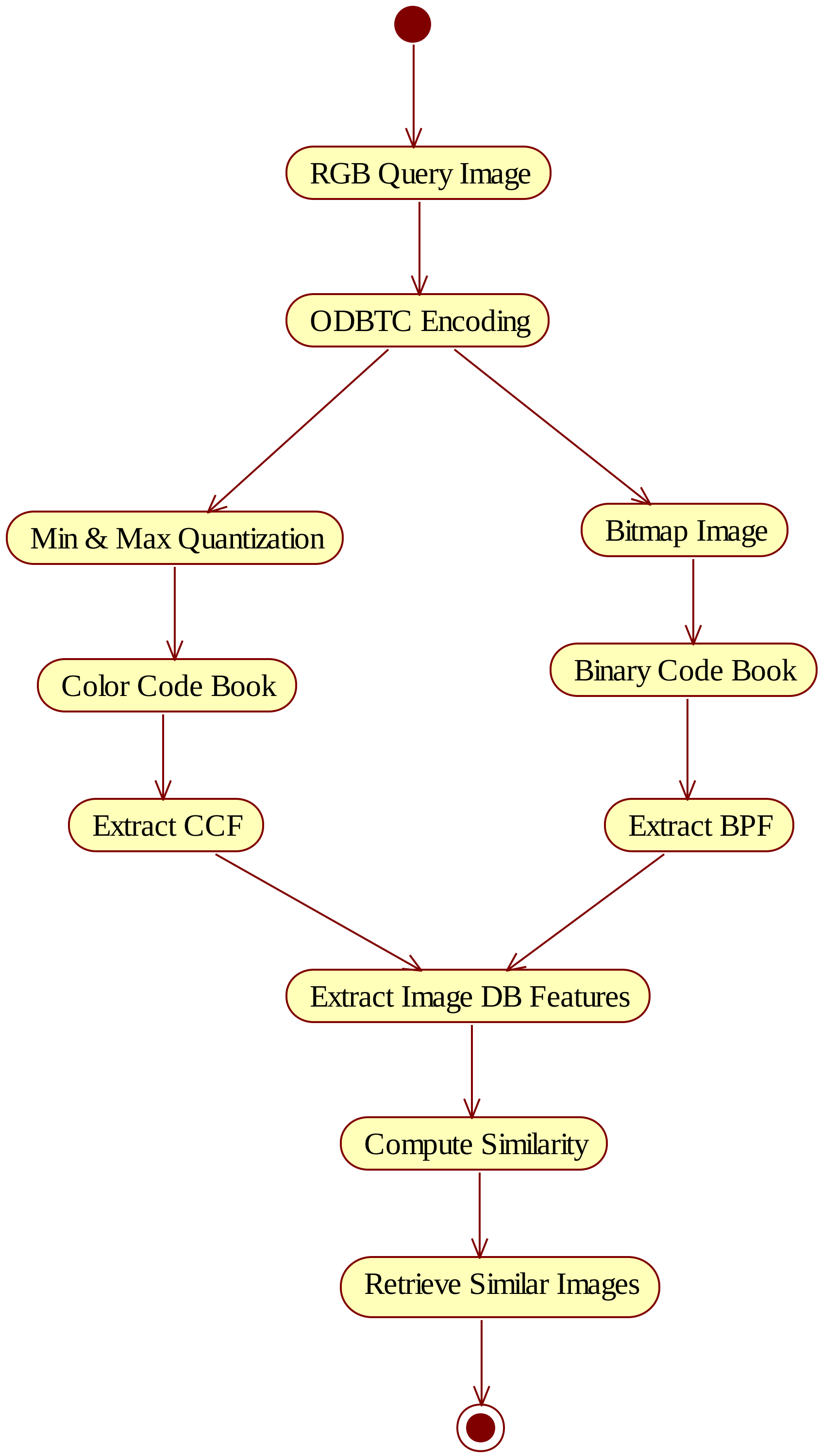


Fig. 3. Activity Diagram

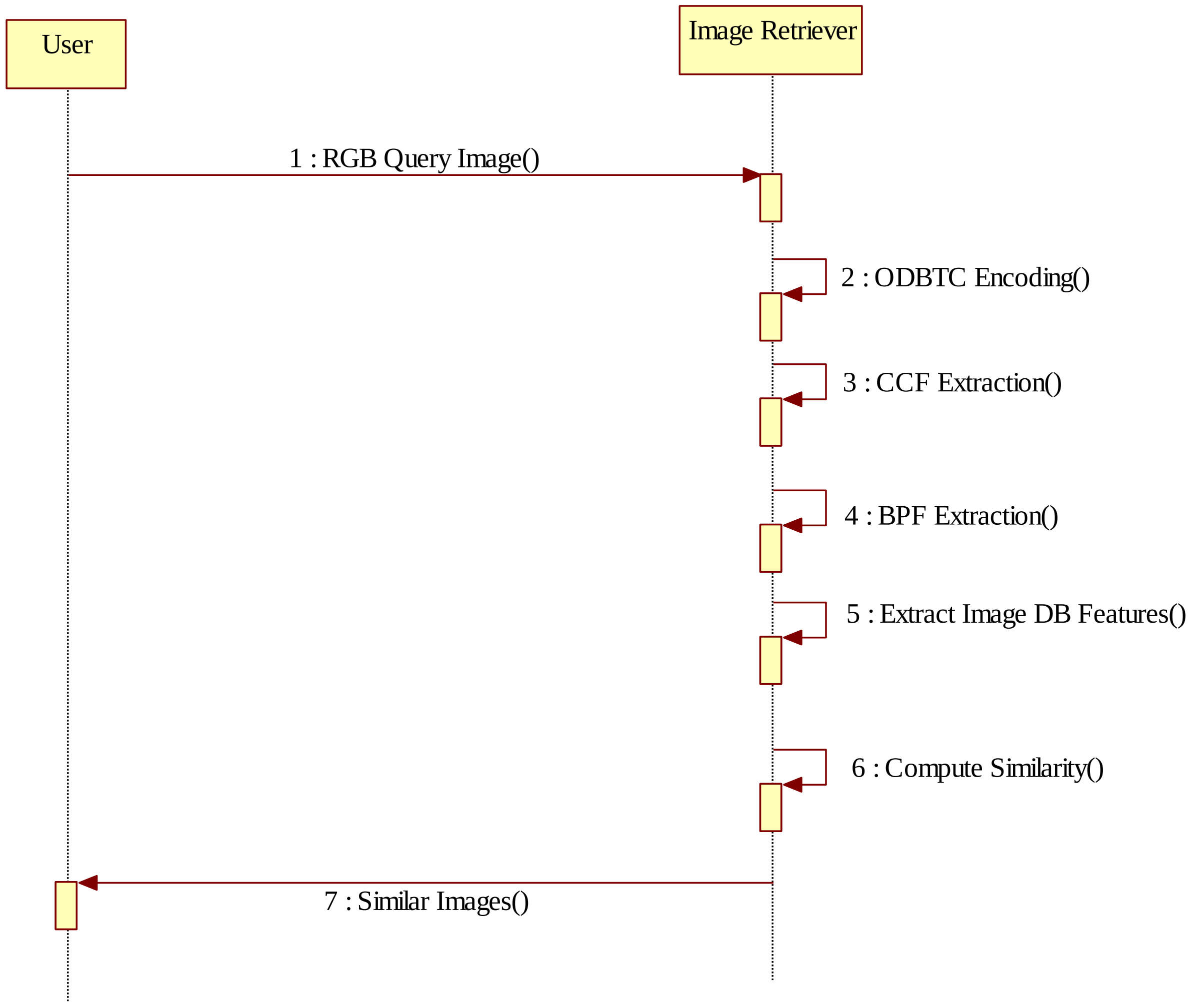


Fig. 4. Sequence Diagram

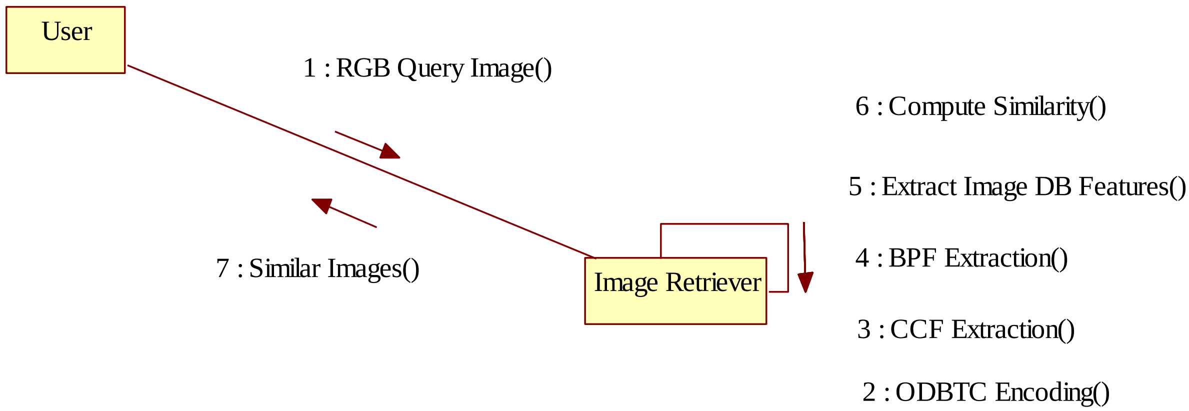


Fig. 5. Collaboration Diagram

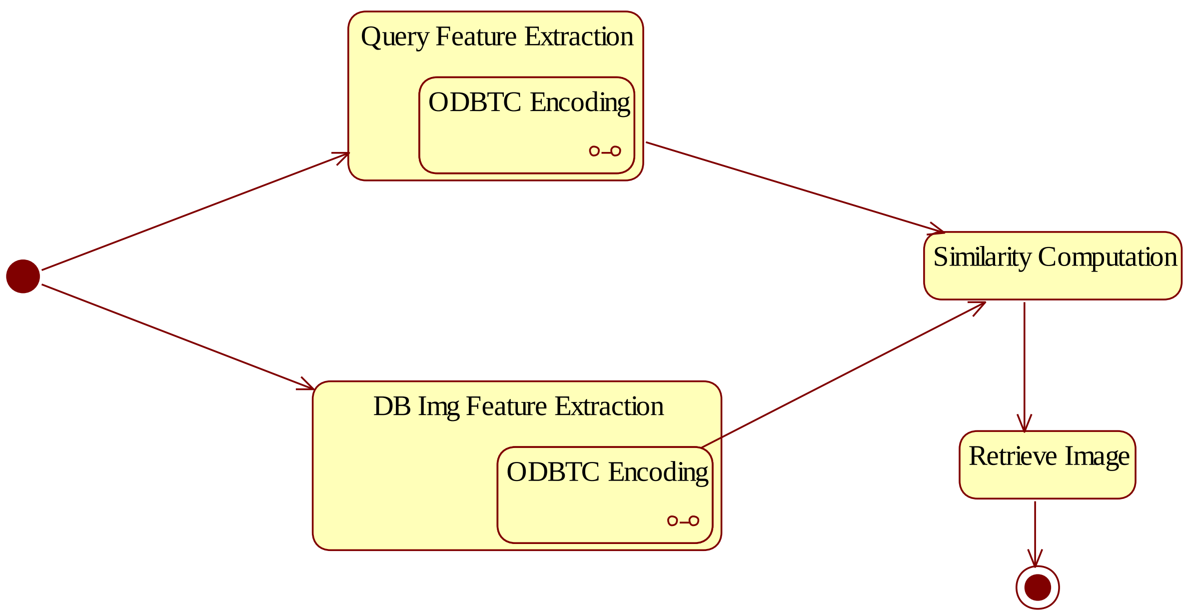


Fig. 6. State chart Diagram

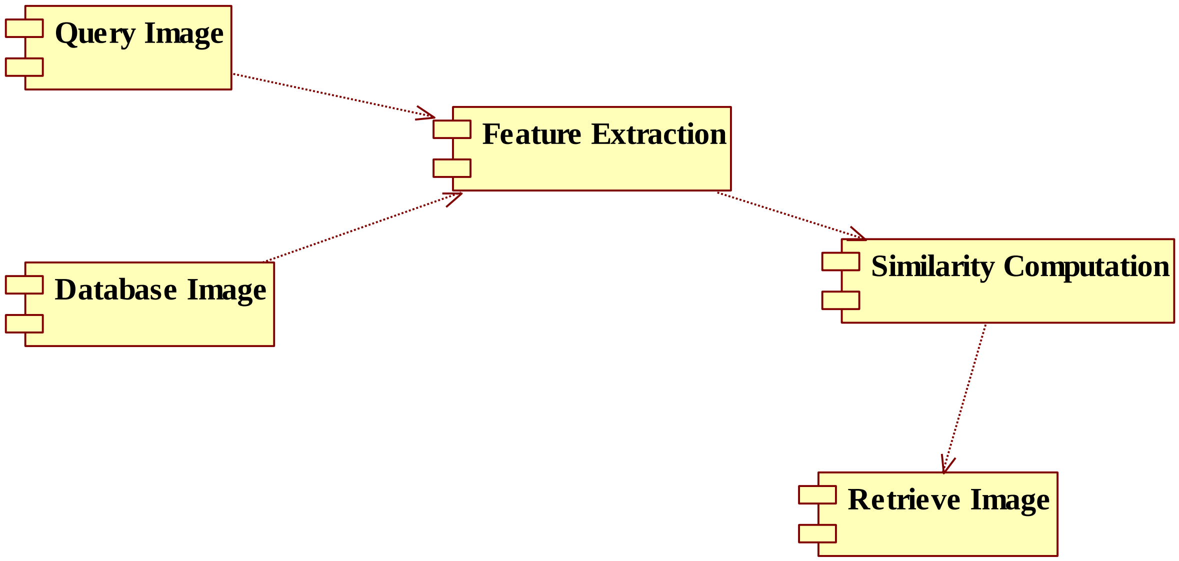


Fig. 7. Component Diagram

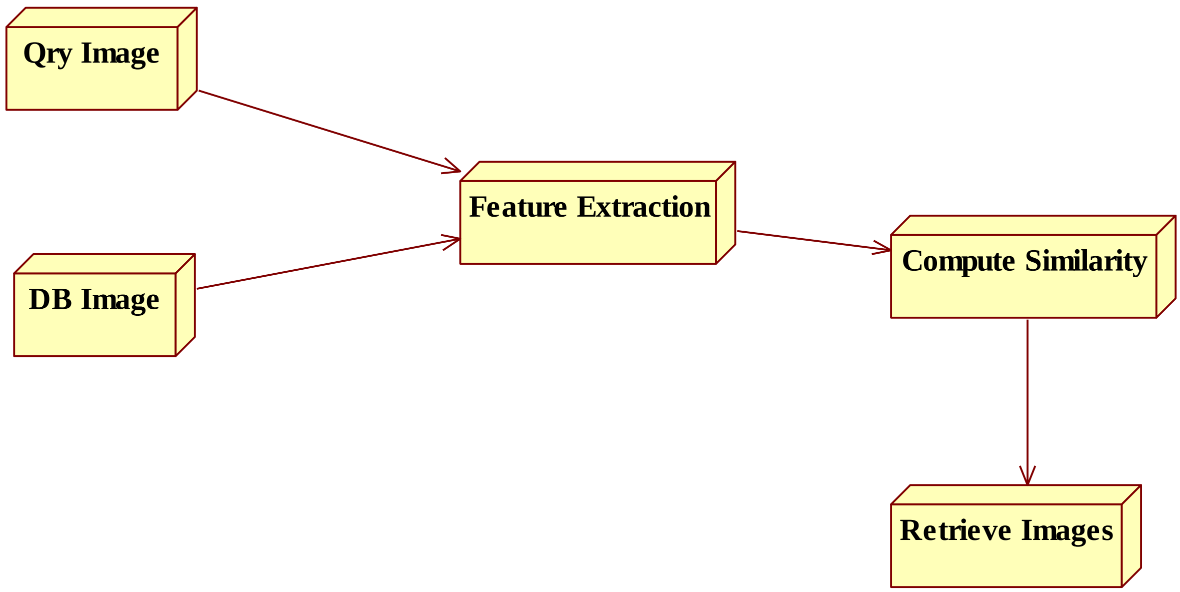


Fig. 8. Deployment Diagram

4.2 DESIGN CONSTRAINTS AND STANDARDS

The application considers two constraints, namely, economic, ethical and social. Economic constraint is satisfied by providing plausible success rate and survey communications.

This IEEE standard identifies and provides definitions for computed aided designs,character inference, computer assisted instruction, writer inference tasks, language processing, data processing and analysis among others. Our method provides an efficient way to propose a bandwidth- and energy efficient image sharing system, called BEES, for real-time SA in disasters. These modules are implemented in the application subject to INSPEC Accession Number: 18344316,DOI: 10.1109/TPDS.2018.2859930 IEEE Transactions on Parallel and Distributed Systems

4.3 DESIGN ALTERNATIVES

To detect image similarity, image features are first extracted and uploaded to the servers. Even through being more energy-efficient than other feature extraction algorithm ORB still incurs much energy consumption. It is necessary to reduce the energy overhead of feature extraction for energy-constraint smart phones. We observe that compressing the in-memory bitmaps of images before extracting their features can significantly decrease the computation (energy) overhead. However, computing the features from compressed image bitmaps also decreases the quality of image features. The bitmap compression proportion is defined as the ratio of the decrement in the length or width of the compressed image bitmap to those of the original bitmap.

4.4 PROPOSED APPROACH

The proposed system Content-Based Image Retrieval (CBRD) uses BEES algorithm the visual contents of an image such as color, shape, texture, and spatial layout to represent and index the image. Active research in CBRD is geared towards the development of methodologies for analyzing, interpreting cataloging and indexing image databases. In addition to their development, efforts are also being made to evaluate the performance of image retrieval systems. The quality of response is heavily dependent on the choice of the method used to generate feature vectors and similarity measure for comparison of features. In this paper we proposed an algorithm which incorporates the advantages of various other algorithms to improve the accuracy and performance of retrieval. The accuracy of color histogram based matching can be increased by using Color Coherence Vector (CCV) for successive refinement. The speed of shape based retrieval can be enhanced by considering approximate shape rather than the exact shape. In addition to this a combination of color and shape based retrieval is also included to improve the accuracy of the result.

4.4.1 IMAGE PREPROCESSING AND FEATURE EXTRACTION

In the input module, the feature vector from the input image is extracted and that input image is stored in the image dataset. The feature vector of each image in the dataset is also stored in the dataset whereas in the second module i.e. query module, a query image is inputted. After that the extraction of its feature vector is done. The features which are widely used involve: texture, color, local shape and spatial information. There is very high demand for searching image datasets of ever-growing size, this is reason why CBRD is becoming very popular.

4.4.2 BEES FEATURE EXTRACTION FOR REFERENCE AND TEST IMAGES:

BEES transforms image data into scale-invariant coordinates virtual to local features and generates large numbers of features that compactly cover the image over the full range of scales and locations. Shape is an important visual feature and it is one of the basic features used to describe image content.To make the problem even more complex, shape is often corrupted with noise, defects, arbitrary distortion and occlusion. Further it is not known what is important in shape. Current approaches have both positive and negative attributes; computer graphics or mathematics use effective shape representation which is unusable in shape recognition and vice versa.Usually, the simple geometric features can only discriminate shapes with large differences; therefore, they are usually used as filters to eliminate false hits or combined with other shape descriptors to discriminate shapes. Each feature vectors are invariant to its geometrical variational versions and partially invariant to enlightenment changes and robust to geometric deformation**.**

4.4.3 IMAGE ANALYSIS:

In this module that have two functions as below

Scale-space extrema detection

Searches over all scales and image locations.A difference-of-Gaussian function to identify potential interest points that are invariant to scale and orientation.

Key point localization

A key point has been found by comparing a pixel to its neighbors and is to perform a detailed fit to the nearby data for location, scale, and ratio of key curvatures. The low contrast points or poorly localized along an edges are removed by key point localization.

4.4.4 IMAGE RETERIVAL:

The key points are transformed into a representation that allows for significant levels of local shape distortion and change in illumination. The descriptor representation approach assessing the similarity between BEES feature descriptors can be measured by matching their corresponding image by color,shape,size,texture and it will be displayed.

Algorithm for Color Retrieval

Step1: Read the image

Step2: Convert from RGB to HSV

Step3: Find HSV histogram and create vectors v1.

Step4: Read the vectors from database and compare one by one by one with vector v1.

Step5: Shortlist all the images which fall within the threshold.

Step6: find coherency of the query image for each color and create coherency vector c1.

Step7: Compare coherency vectors of all the short listed images from step5 with c1.

Step8: Store all matching images in results folder and also display them.

Shape Retrieval

The proposed shape retrieval system based on the automatic segmentations process to get approximate information about the shape of an object. Then three attributes: Mass,Centroid and Dispersion for each class are calculated and stored as the shape vector. For retrieval the vectors of the query image and database images are compared and the most matching images are short listed as results.

Algorithm for shape Retrieval

Step1: read the image

Step2: convert it from RGB to gray scale

Step3: determine the range and number of classes.

Step4: calculate the number of pixels i.e. mass belonging to each class.

Step5: calculate the centroid and dispersion for each class.

Step6: compare centroid of each class of query image with the centroids of each class from database image and extract out

that class.

Step7: compare that class‟s mass and dispersion with respective class.

Step8: increase the count if it satisfies certain threshold.

Step9: consider second class and repeat steps 6-8 till all classes get over.

Step10: take another image from the database and repeat the comparison.

Step11: display the images with maximum count.

4.4.5 SIZE AND TEXTURE SIMILARITY MEASURE

In this algorithm we propose that matching is done on color by color basis. By analyzing histograms, first calculate the number of colors in both query image and database image. The image which satisfies most of the conditions is the best match. Retrieval result is not a single image but a list of images ranked by their similarities with the query image since CBRD is not based on exact matching.

If I is the database image and I‟‟ is the query image, then the similarity measure is computed as follows,

1. Calculate histogram vector vI = [vI1, vI2, ….vIn] and ccv vector cI = [cI1, cI2, ….cIn] of the database images.

2. Calculate the vectors vI‟‟ and cI‟‟ for the query image also.

3. The Euclidean distance between two feature vectors can then be used as the similarity measurement:

4. If $d \leq \tau$ (threshold) then the images match.

5. From all the matching images we display top 24 images as a result.

These features are compared with database images stored features. The features values which are less than defined threshold are sorted based on increasing difference between query and database images then stored separately.

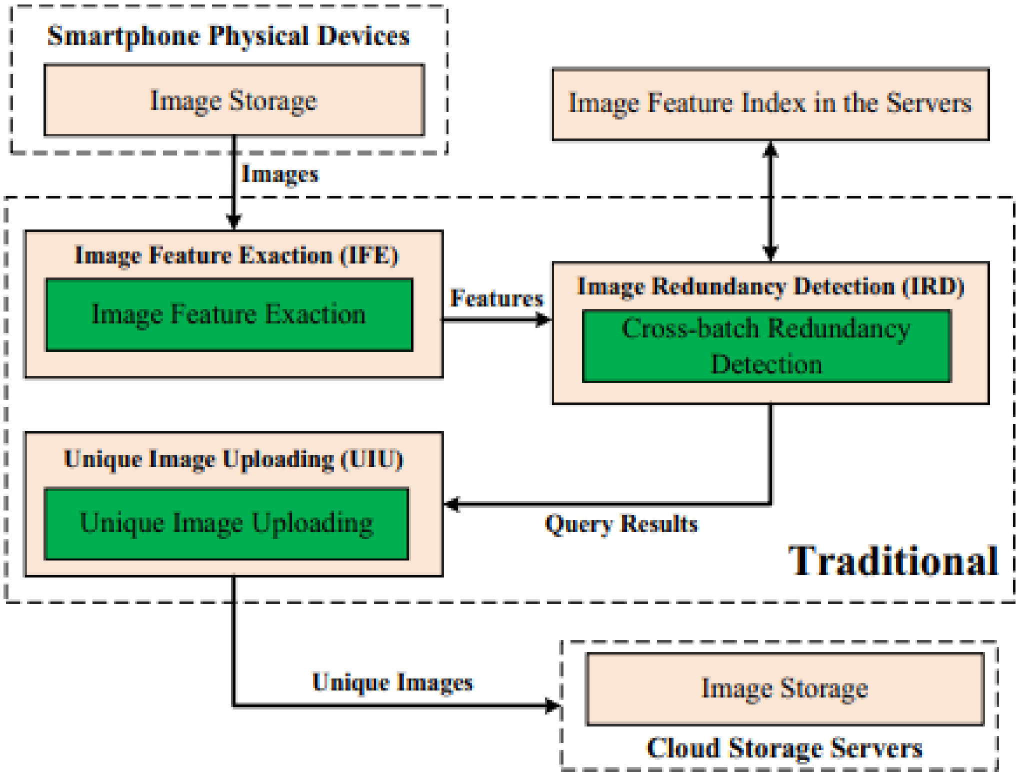


Fig. 9. SYSTEM ARCHITECTURE EXISTING DIAGRAM

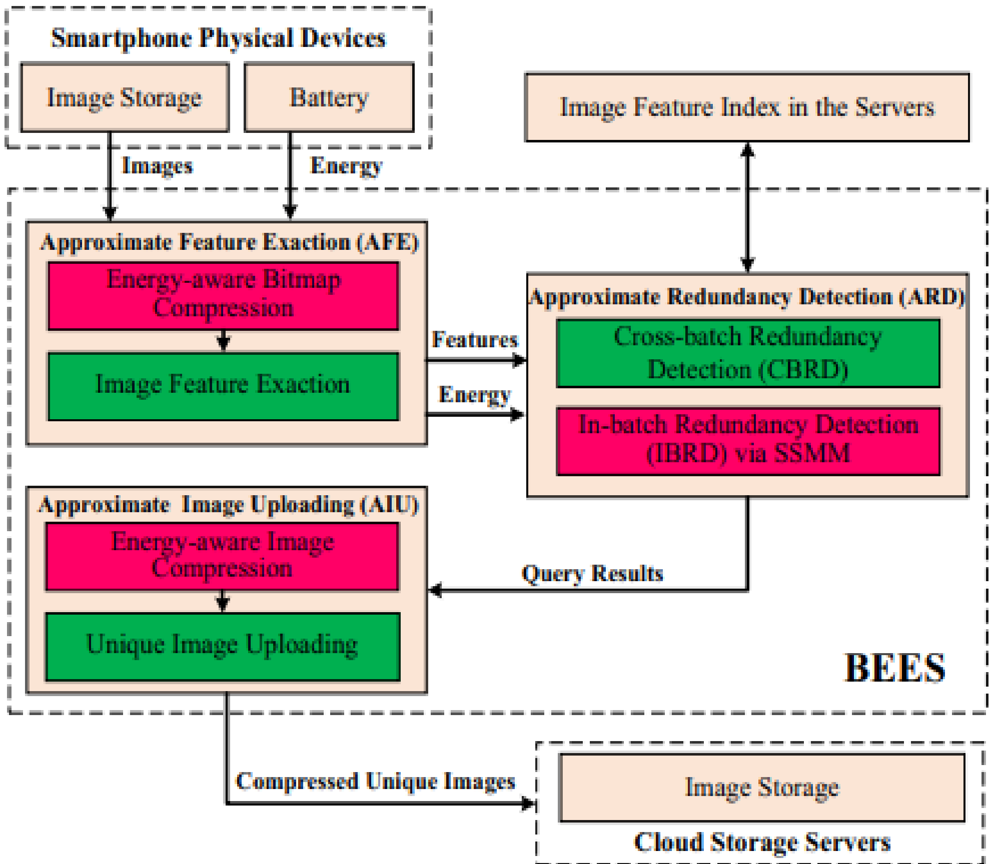


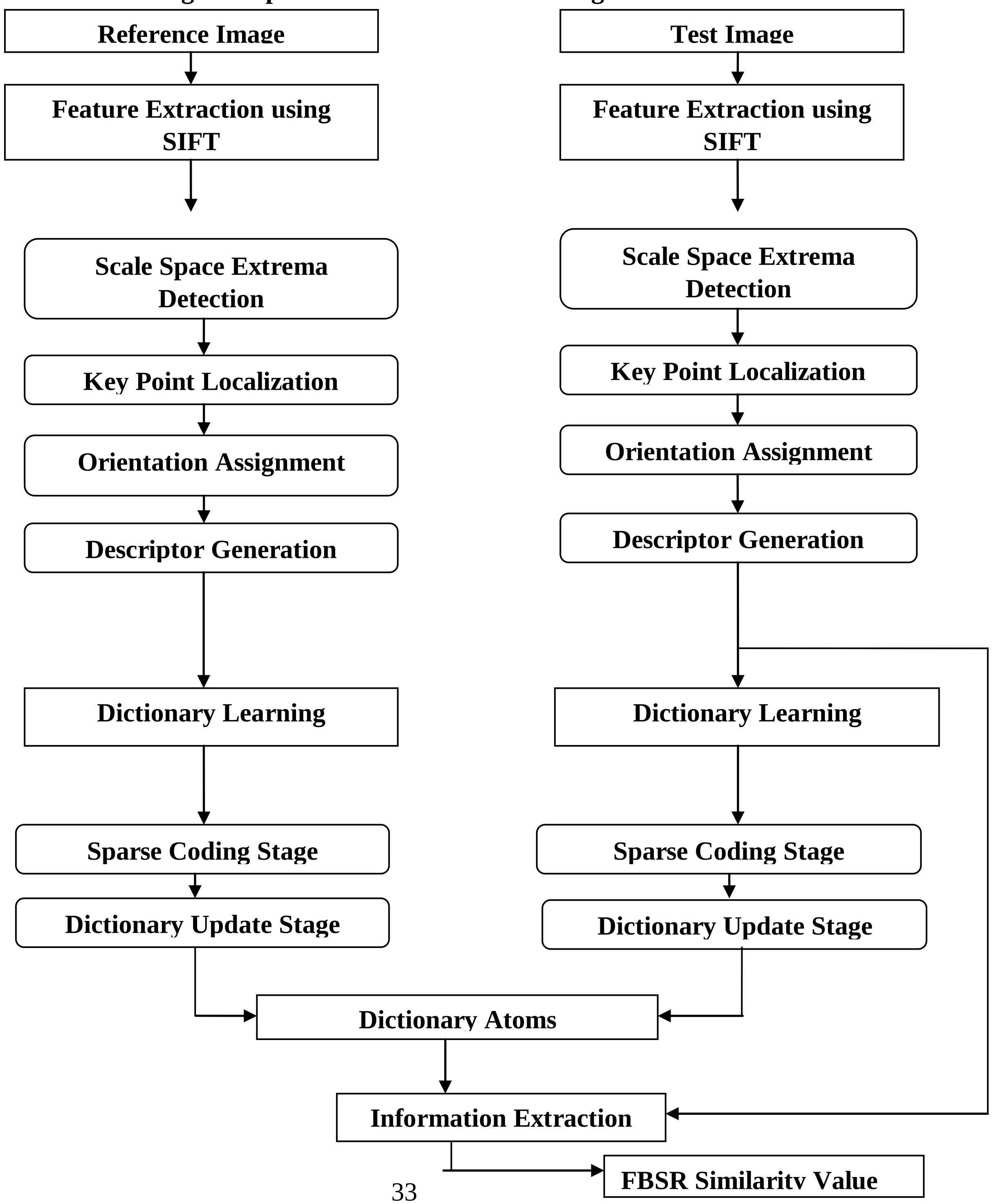
Fig.10. SYSTEM ARCHITECTURE PROPOSED DIAGRAM

CHAPTER 5

IMPLEMENTATION AND RESULTS

5.1 IMPLEMENTATION AND RESULTS:

Fig.11 Implementation and Results diagram



We propose a bandwidth- and energy efficient image sharing system, called BEES, for real-time SA in disasters. BEES reduces not only the cross-batch redundant images but also in-batch redundant images in the source, and further leverages approximate image sharing to trade the the quality of computation results in content based redundancy elimination for higher bandwidth and energy efficiency. Moreover, the energy-aware adaptive schemes are introduced in BEES to offer an objective and quantitative trade-off between computation quality and efficiency based on the remaining energy. Extensive experimental results demonstrate that BEES reduces more than 67:3% energy overhead, 77:4% bandwidth overhead, 70:4% average image uploading delay, and extends 84:3% battery lifetime, compared with the state-of-the-art work.Due to the bandwidth and energy constraints in disaster environments, we reduce the transmission of near-duplicate/similar images and upload the valuable and unique ones. However, we do not remove any near duplicate images which are still stored in smartphones without any loss of data. When the energy is sufficient and network is restored, the remaining images can be uploaded. On the other hand, saving energy for extending the battery lifetime will motivate users not to upload redundant images

5.2 TESTING

SYSTEM TESTING

System testing is the stage of implementation, which is aimed at ensuring that the system works accurately and efficiently before live operation commences. Testing is vital to the success of the system. System testing makes a logical assumption that if all the parts of the system are correct, the goal will be successfully achieved. The candidate system is subject to a variety of tests.A series of tests are performed for the proposed system before the system is ready for user acceptance testing.

The testing steps are:

- Unit testing
- Integration testing
- Validation testing

- Output testing
- User acceptance testing

UNIT TESTING

Unit testing focuses verification efforts on the smallest unit of software design, the module. This is also known as “module testing” .The modules are tested separately. This testing is carried out during programming stage itself. In this testing step, each module is found to be working satisfactorily as regard to the expected output from the module.

INTEGRATION TESTING

Data can be lost across an interface; one module can have an adverse effect on others; sub-functions when combined may not produce the desired major functions; integration testing is a systematic testing for constructing the program structure. While at the same time conducting to uncover errors associated within the interface? The objective is to take unit tested modules and to combine them and test it as a whole. Here correction is difficult because the vast expenses of the entire program complicate the isolation of causes. This is the integration-testing step; all the errors encountered are corrected for the next testing step.

VALIDATION TESTING

Verification testing runs the system in a simulated environment using simulated data. This simulated test is sometimes called alpha testing. This simulated test is primarily looking for errors and monitions regarding end user and decisions design specifications hat where specified in the earlier phases but not fulfilled during construction.

Validation refers to the process of using software in a live environment in order to find errors. The feedback from the validation phase generally produces changes in the software to deal with errors and failures that are uncovered. Than a set of user sites is selected that puts the system in to use on a live basis. They are called beta tests.

The beta test suits use the system in day to day activities. They process live transactions and produce normal system output. The system is live in every sense of the word; except that the users are aware they are using a system that can fail. But the transactions that are entered and persons using the system are real. Validation may continue for several months. During the course of validating the system, failure may occur and the software will be changed. Continued use may produce additional failures and need for still more changes.

OUTPUT TESTING

After performing the validation, the next step is output testing of the proposed system, since no system could be useful if it does not produce the required output in the specified format. Asking the users about the format required by them tests the output generated or displayed by the system under consideration. Hence the output format is considered in two ways-one is on screen and another in printed format.

USER ACCEPTANCE TESTING

User acceptance of a system is the key factor for the success of any system. The system under consideration is tested for the user acceptance by constantly keeping in touch with the prospective system users at the time of developing and making changes whenever required. This is done in regard to the following point:

An acceptance test has the objective of selling the user on the validity and reliability of the system .it verifies that the system's procedures operate to system specifications and that the integrity of important data is maintained. Performance of an acceptance test is actually the user's show. User motivation is very important for the successful performance of the system. After that a comprehensive test report is prepared. This report shows the system's tolerance, Performance range, error rate and accuracy.

SYSTEM MAINTENANCE

The objectives of this maintenance work are to make sure that the system gets into work all time without any bug. Provision must be for environmental changes which may affect the computer or software system. This is called the maintenance of the system. Nowadays there is the rapid change in the software world. Due to this rapid change, the system should be capable of adapting these changes. In this project the process can be added without affecting other parts of the system.Maintenance plays a vital role. The system is liable to accept any modification after its implementation. This system has been designed to favor all new changes. Doing this will not affect the system's performance or its accuracy.

Maintenance is necessary to eliminate errors in the system during its working life and to tune the system to any variations in its working environment. It has been seen that there are always some errors found in the system that must be noted and corrected. It also means the review of the system from time to time.

The review of the system is done for:

- Knowing the full capabilities of the system.
- Knowing the required changes or the additional requirements.
- Studying the performance.

TYPES OF MAINTENANCE:

- Corrective maintenance
- Adaptive maintenance
- Perfective maintenance
- Preventive maintenance

CORRECTIVE MAINTENANCE

Changes made to a system to repair flows in its design coding or implementation. The design of the software will be changed. The corrective maintenance is applied to correct the errors that occur during that operation time. The user may enter invalid file type while submitting the information in the particular field, then the corrective maintenance will displays the error message to the user in order to rectify the error.

Maintenance is a major income source. Nevertheless, even today many organizations assign maintenance to unsupervised beginners, and less competent programmers.

The user's problems are often caused by the individuals who developed the product, not the maintainer. The code itself may be badly written maintenance is despised by many software developers Unless good maintenance service is provided, the client will take future development business elsewhere. Maintenance is the most important phase of software production, the most difficult and most thankless.

ADAPTIVE MAINTENANCE:

It means changes made to system to evolve its functionalities to change business needs or technologies. If any modification in the modules the software will adopt those modifications. If the user changes the server then the project will adapt those changes. The modification server work as the existing is performed.

PERFECTIVE MAINTENANCE:

Perfective maintenance means made to a system to add new features or improve performance. The perfective maintenance is done to take some perfect measures to maintain the special features. This proposed system could be added with additional functionalities easily. In this project, if the user wants to improve the performance further then this software can be easily upgraded.

PREVENTIVE MAINTENANCE:

Preventive maintenance involves changes made to a system to reduce the changes of features system failure. The possible occurrence of error that might occur are forecasted and prevented with suitable preventive problems. If the user wants to improve the performance of any process then the new features can be added to the system for this project

5.2.1 Data setcategorization

We use the Paris image set to evaluate the coverage, since each image in the image set is geotagged to facilitate its mapping in the real map. Since the complete set of the Paris image set is too large, we select a subset as the test image set covering the area from 2.31 to 2.34 degrees east longitude and from 48.855 to 48.872 degrees north latitude. The test image set consists of 165,539 images which have 58,818 unique locations (i.e. longitudes and latitudes) in the map. The densest location has 5,399 images. We equally divide the 165,539 images into 25 groups and respectively store them in 25 smartphones. The initial energy of all 25 smartphone batteries is full. 40 images are considered as a group in the smartphones. The 25 smartphones respectively upload animage group every 20 minutes. The servers add the features of the uploaded images into the index for redundancy detection once receiving the images from BEES clients. The coverage of the images uploaded using Direct Upload in the map. In BEES, the smartphones upload 58,750 images which have 46,122 unique locations in the map. The coverage of the images uploaded using BEES in the map. BEES uploads 18:8% more images while has 97:1% larger coverage (i.e., the number of unique locations covered) than Direct Upload, since BEES reduces the redundant images and uses sub modular maximum model to efficiently summarize the uploaded image batch.

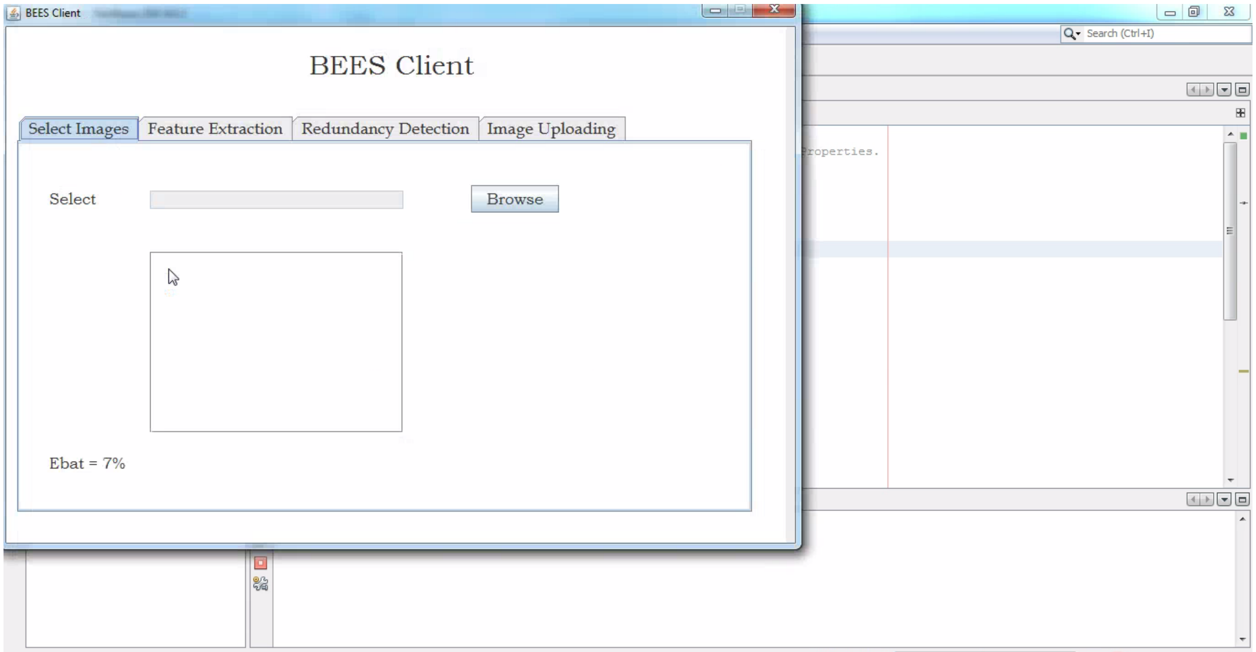
5.2.2 Performance of testing

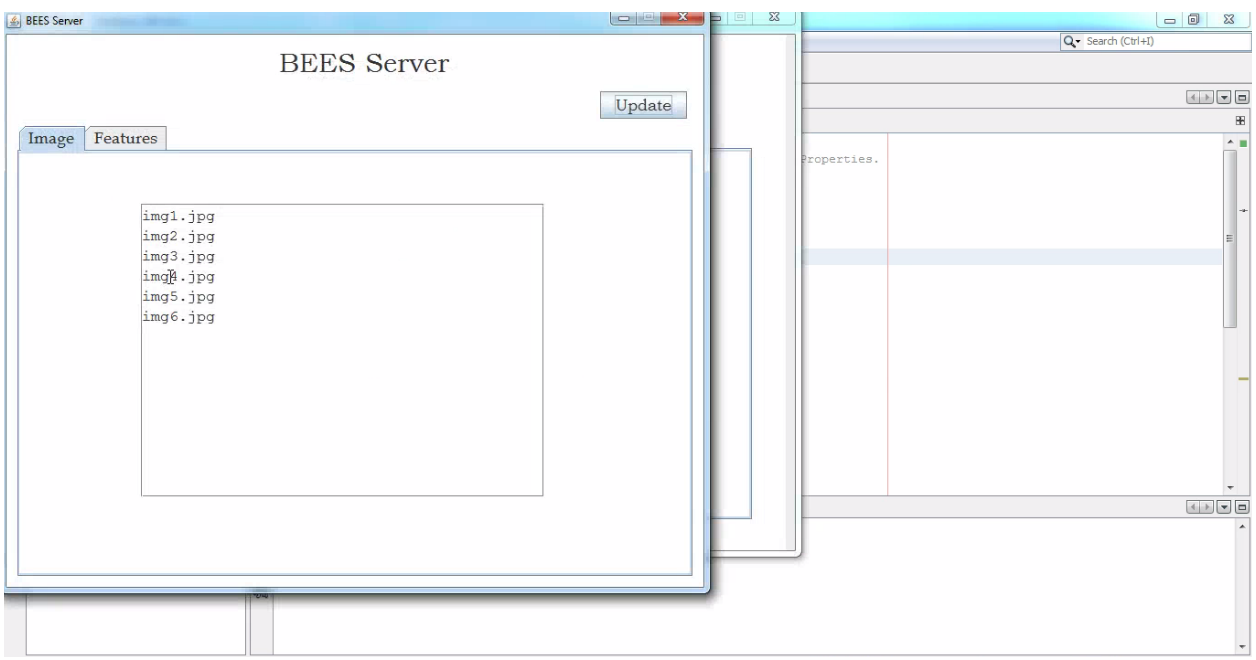
For instance, two images taken in the same place at different times are near-duplicate, which implies that the conditions in the place haven't changed during the period. However, without uploading near-duplicate images, BEES can still obtain the important information implied by them, due to detecting similarity using image features. When a near-duplicate image in the server is detected, BEES can efficiently obtain the information of the "no change", i.e., the conditions/situations shown in the image have not significantly changed during the period.If a user insists on uploading his/her images no matter whether near-duplicate images exist, a knob being settable by the user in BEES allows the user to directly upload images. The parameter tbat is the remaining energy in default, which is used to guide the trade-offs between computing precision and energy efficiency. Tbat can also be set by the user via a knob. To maximize battery lifetime, the user can always set Tbat to 0 even with the full battery energy.

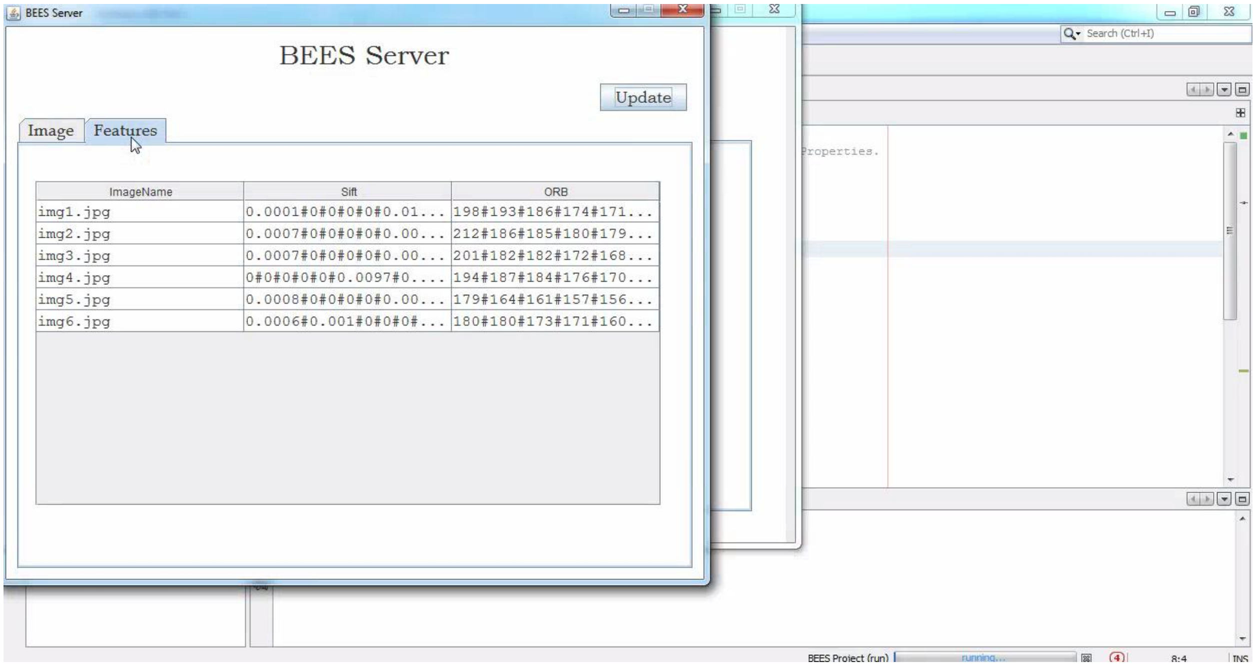
Fig. 12 Testing For Quality Compression

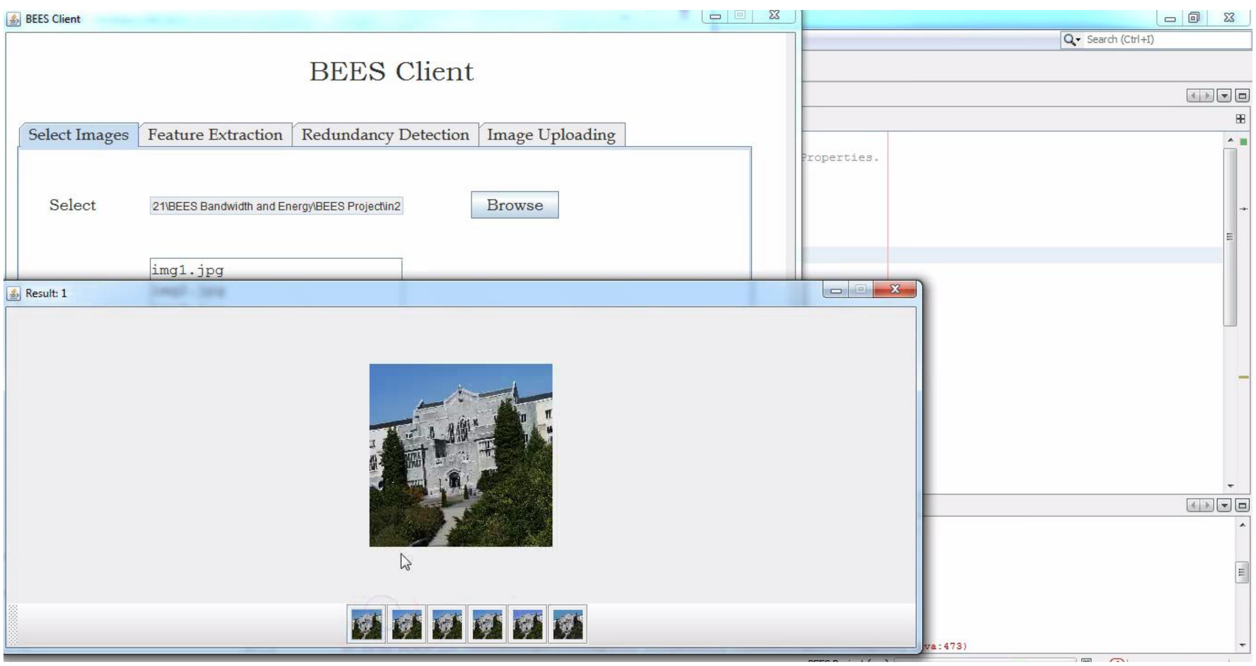
Fig. 13. Feature Extraction Performance

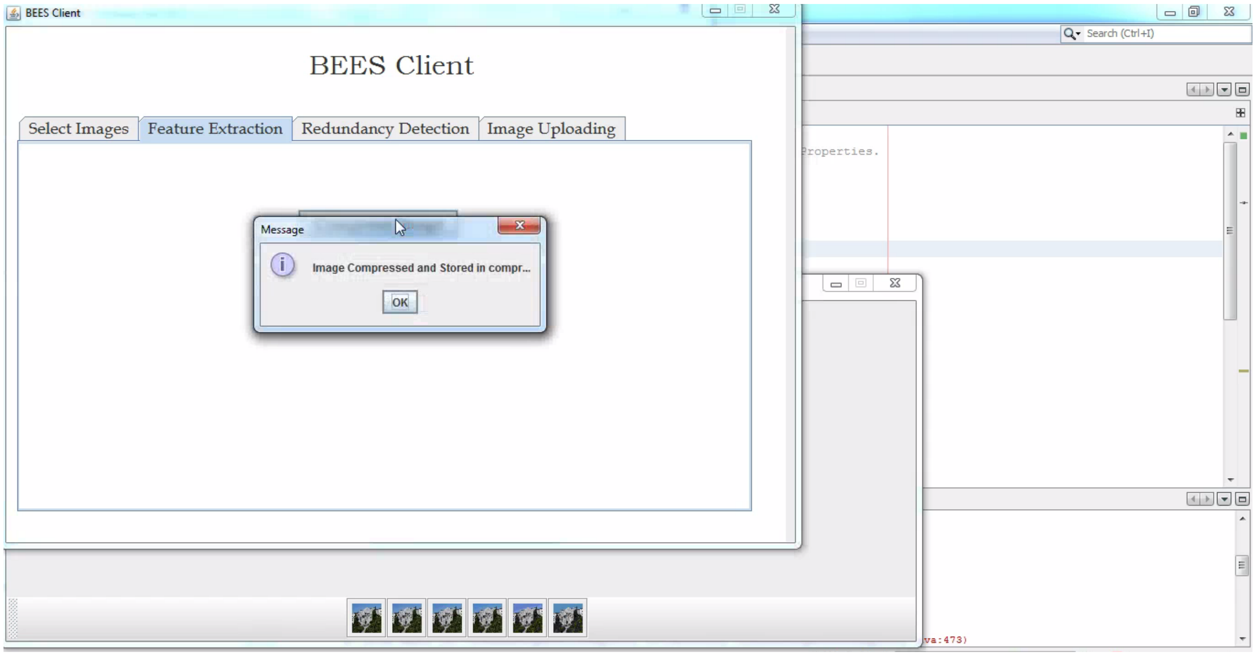
5.3 USER INTERFACE

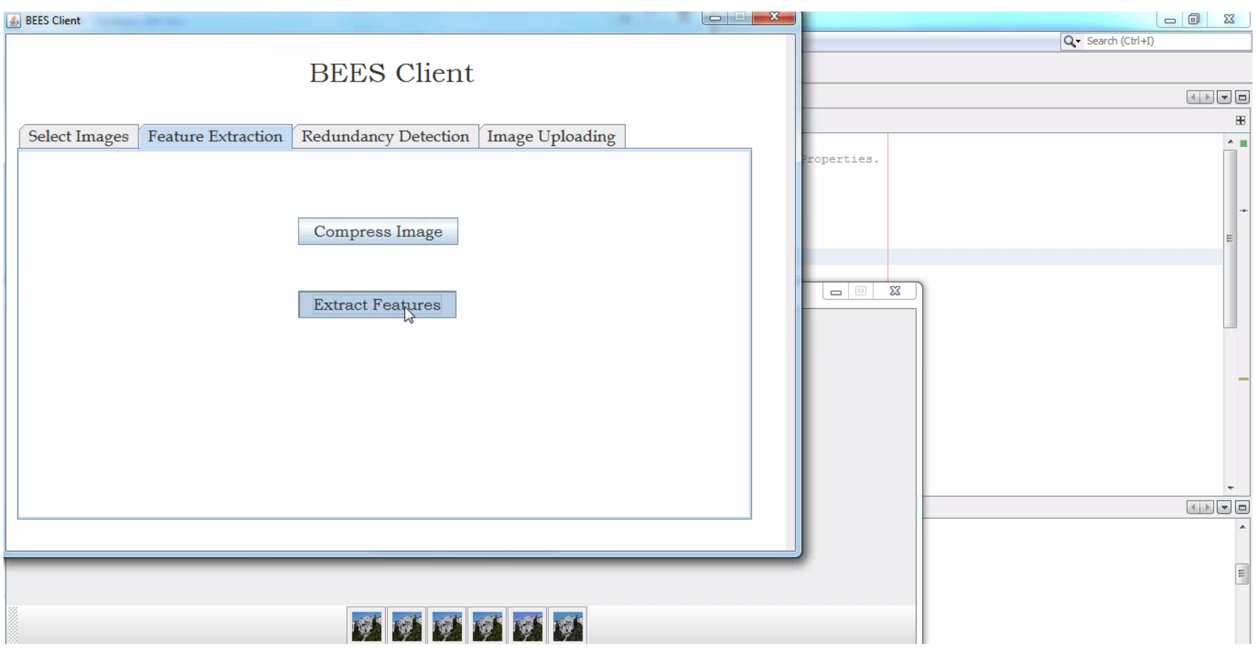


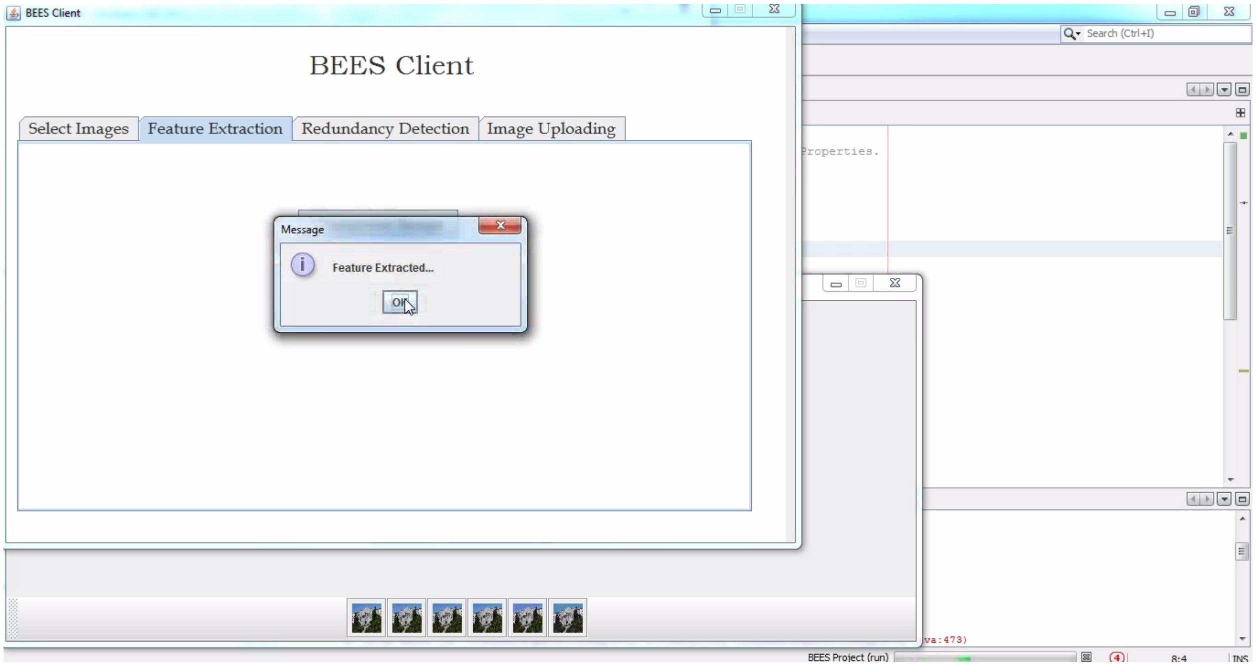


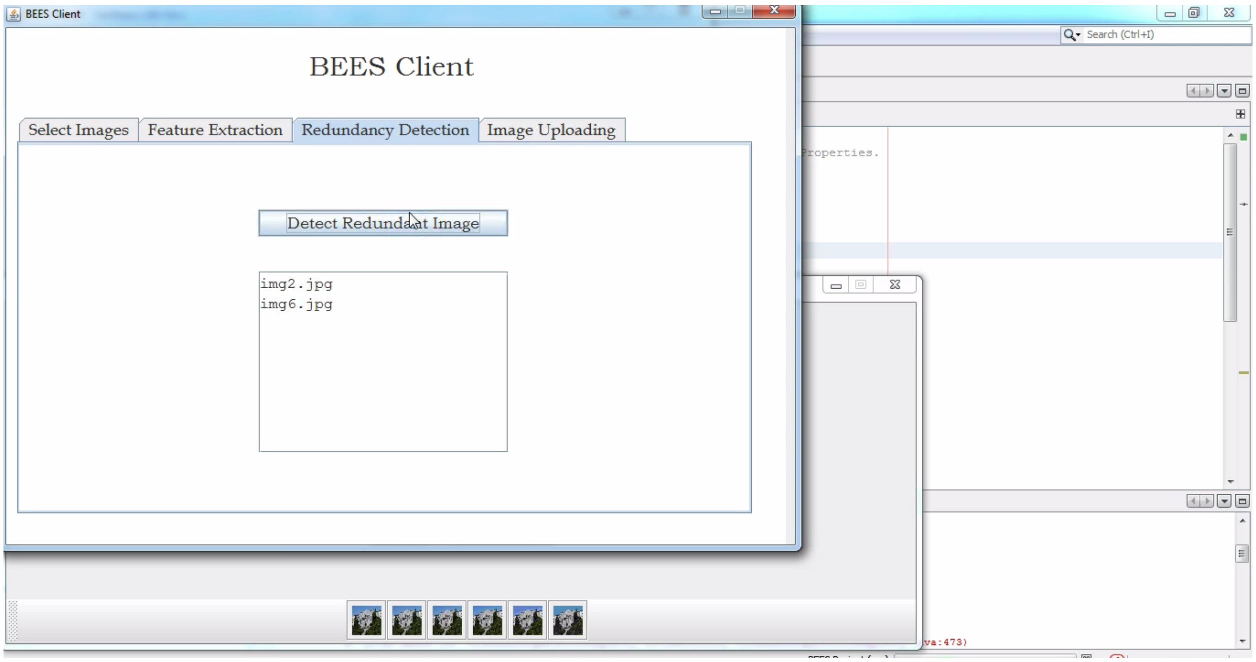

BEES Server
Search (Ctrl+I)
BEES Server
Update
Image
Features
ImageName
Sift
ORB
img1.jpg 0.0001#0#0#0#0#0.01... 198#193#186#174#171...
img2.jpg 0.0007#0#0#0#0#0.00... 212#186#185#180#179...
img3.jpg 0.0007#0#0#0#0#0.00... 201#182#182#172#168...
img4.jpg 0#0#0#0#0#0.0097#0.... 194#187#184#176#170...
img5.jpg 0.0008#0#0#0#0#0.00... 179#164#161#157#156...
img6.jpg 0.0006#0.001#0#0#0#... 180#180#173#171#160...
Properties.
BEES Project (run)
running...
8:4
INS

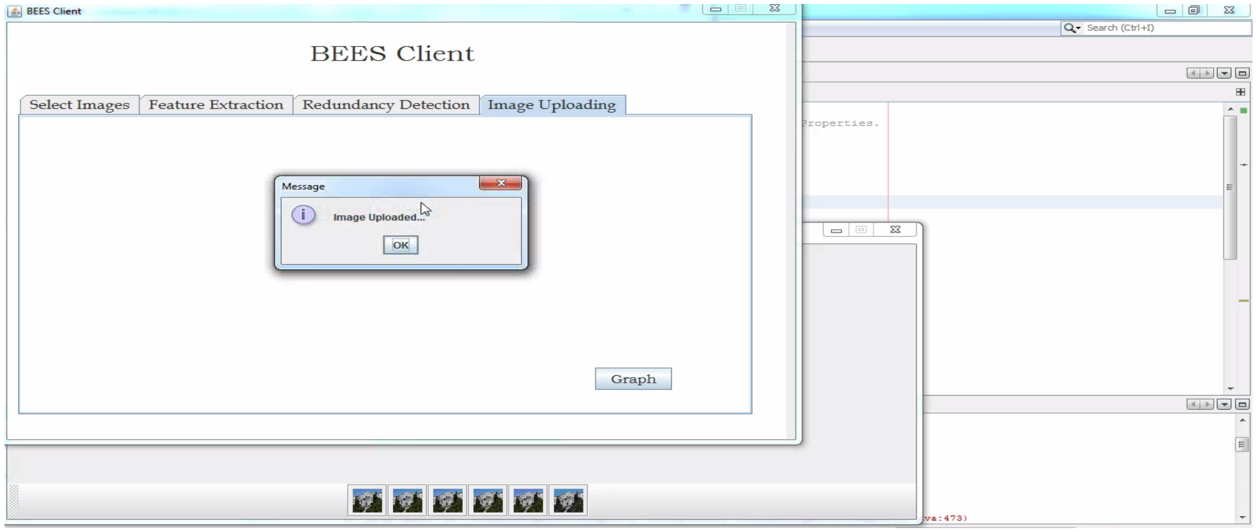

BEES Client
Search (Ctrl+I)
BEES Client
Select Images
Feature Extraction
Redundancy Detection
Image Uploading
Select
21\BEES Bandwidth and Energy\BEES Project\in2
Browse
img1.jpg
Result: 1
Properties.

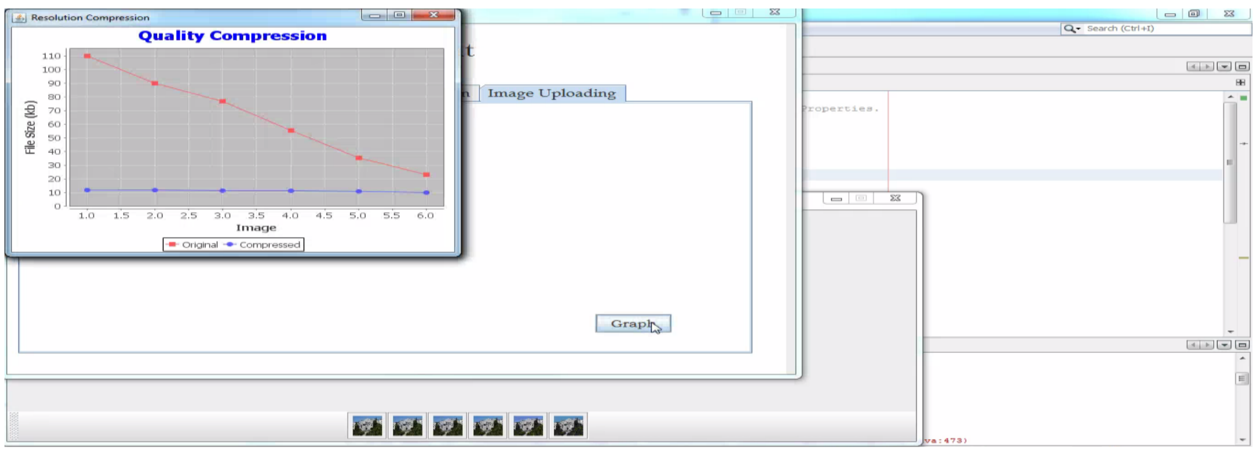

BEES Client
BEES Client
Select Images
Feature Extraction
Redundancy Detection
Image Uploading
Message
Image Compressed and Stored in compr...
OK
Search (Ctrl+I)

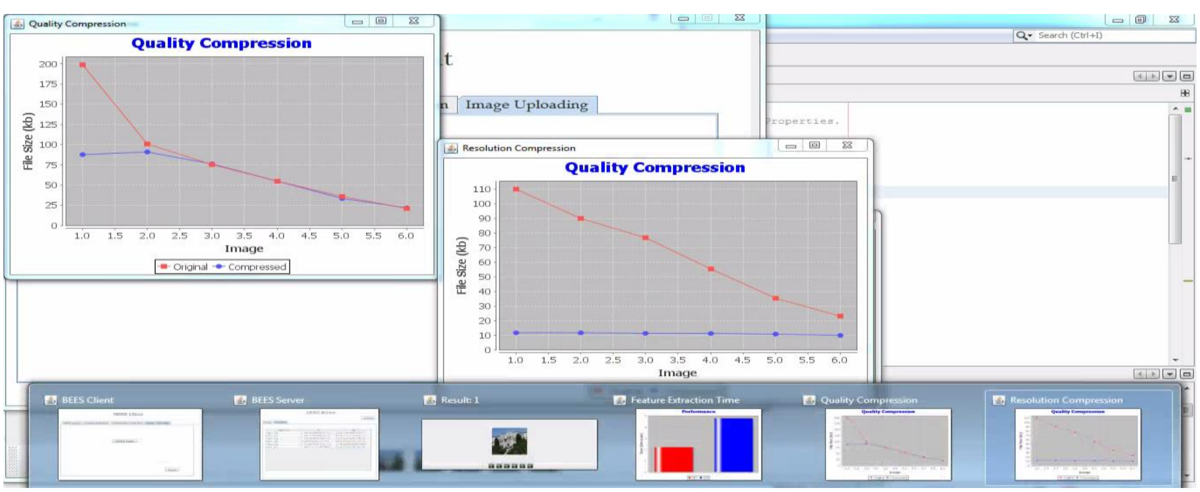

BEES Client
BEES Client
Select Images
Feature Extraction
Redundancy Detection
Image Uploading
Compress Image
Extract Features
Search (Ctrl+I)


BEES Client
BEES Client
Select Images
Feature Extraction
Redundancy Detection
Image Uploading
Message
Feature Extracted...
OK
Search (Ctrl+I)
BEES Project (run)


BEES Client
BEES Client
Select Images
Feature Extraction
Redundancy Detection
Image Uploading
Detect Redundant Image
img2.jpg
img6.jpg
Search (Ctrl+I)


BEES Client
BEES Client
Select Images
Feature Extraction
Redundancy Detection
Image Uploading
Message
Image Uploaded...
OK
Graph
Search (Ctrl+I)


Resolution Compression
Quality Compression
File Size (kb)
Image
Original
Compressed
Image Uploading
Graph
Search (Ctrl+I)


Quality Compression
Quality Compression
File Size (kb)
Image
Original
Compressed
Image Uploading
Resolution Compression
Quality Compression
File Size (kb)
Image
BEES Client
BEES Server
Result: 1
Feature Extraction Time
Quality Compression
Resolution Compression
Search (Ctrl+I)

CHAPTER 6

CONCLUSION AND FUTURE SCOPE

In the BEES, we select an image batch with 100 images from the disaster image set as the uploaded images and store the images in the smartphone. We set different cross-batch redundancy ratios 0%; 25%; 50%; and 75%, by adding and removing the redundant images (similar to the uploaded images) into the servers.

To make the BEES feature more compact, the bag-of-words (BoW) representation approach quantizes BEES descriptors by vector quantization technique into a collection of visual words based on a pre-defined visual vocabulary or vocabulary tree

APPENDIX

Source code

Main1.java

```
package bees;
public class Main1 {
    public static void main(String[] args) {


        UserFrame cf=new UserFrame();
        cf.setVisible(true);
        cf.setResizable(false);
        cf.setTitle("BEES Client");
        ServerFrame sf=new ServerFrame();
        sf.setVisible(true);
        sf.setResizable(false);
        sf.setTitle("BEES Server");
    }
}
```

Model.java

```
package bees;
import java.util.Random;
import java.util.Collection;
import java.awt.geom.AffineTransform;
abstract public class Model
{
    static final public int MIN_SET_SIZE = 0;
          final static Random rnd = new Random( 69997 );
```

```
public double error;
public Model(){
	error = Double.MAX_VALUE;
}
public abstract boolean fit( PointMatch[] min_matches );
public abstract float[] apply( float[] point );
public abstract void applyInPlace( float[] point );
public abstract float[] applyInverse( float[] point );
public abstract void applyInverseInPlace( float[] point );
public boolean test(
		Collection< PointMatch > candidates,
		Collection< PointMatch > inliers,
		double epsilon,
		double min_inlier_ratio ){
	inliers.clear();
	for ( PointMatch m : candidates ){
		m.apply( this );
		if ( m.getDistance() < epsilon ) inliers.add( m );
	}
	float ir = ( float )inliers.size() / ( float )candidates.size();
	error = 1.0 - ir;
	if (error > 1.0)
		error = 1.0;
	if (error < 0)
		error = 0.0;
	return ( ir > min_inlier_ratio );
}
```

```
        public boolean betterThan( Model m ){
                if ( error < 0 ) return false;
                return error < m.error;
        }
        abstract public void shake(
                        Collection< PointMatch > matches,
                        float scale,
                        float[] center );
        abstract public void minimize( Collection< PointMatch > matches );
        abstract public AffineTransform getAffine();
        abstract public String toString();
        abstract public Model clone();
};
```

DBConnection.java

```
package bees;
import java.sql.Statement;
import java.sql.Connection;
import java.sql.DriverManager;
public class DBConnection
{
   Connection con;
   Statement stt;
   DBConnection()
   {
      try
      {
         Class.forName("com.mysql.jdbc.Driver");
```

```
            String url="jdbc:mysql://127.0.0.1:3306/bees";
             con=DriverManager.getConnection(url,"root","");
            stt=con.createStatement();
        }
        catch(Exception e)
        {
            e.printStackTrace();
        }
    }
}
```

Server.java

```
package bees;
import java.sql.ResultSet;
import java.sql.Statement;
import java.util.Vector;
import javax.swing.table.DefaultTableModel;
public class ServerFrame extends javax.swing.JFrame {
    public ServerFrame() {
        initComponents();
        display();
    }
   public void display()
    {
        try
        {
            DefaultTableModel dm=(DefaultTableModel)jTable1.getModel();
            int row=dm.getRowCount()
```

```
          public boolean isCellEditable(int rowIndex, int columnIndex) {
              return canEdit [columnIndex];
          }
      });
      jTable1.setRowHeight(24);
      jScrollPane2.setViewportView(jTable1);
      javax.swing.GroupLayout jPanel3Layout = new
javax.swing.GroupLayout(jPanel3);
      jPanel3.setLayout(jPanel3Layout);
      jPanel3Layout.setHorizontalGroup(
jPanel3Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADIN
G)
          .addGroup(jPanel3Layout.createSequentialGroup()
              .addGap(18, 18, 18)
              .addComponent(jScrollPane2,
javax.swing.GroupLayout.PREFERRED_SIZE, 684,
javax.swing.GroupLayout.PREFERRED_SIZE)
              .addContainerGap(21, Short.MAX_VALUE))
      );
      jPanel3Layout.setVerticalGroup(

jPanel3Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADIN
G)
          .addGroup(jPanel3Layout.createSequentialGroup()
              .addGap(39, 39, 39)
```

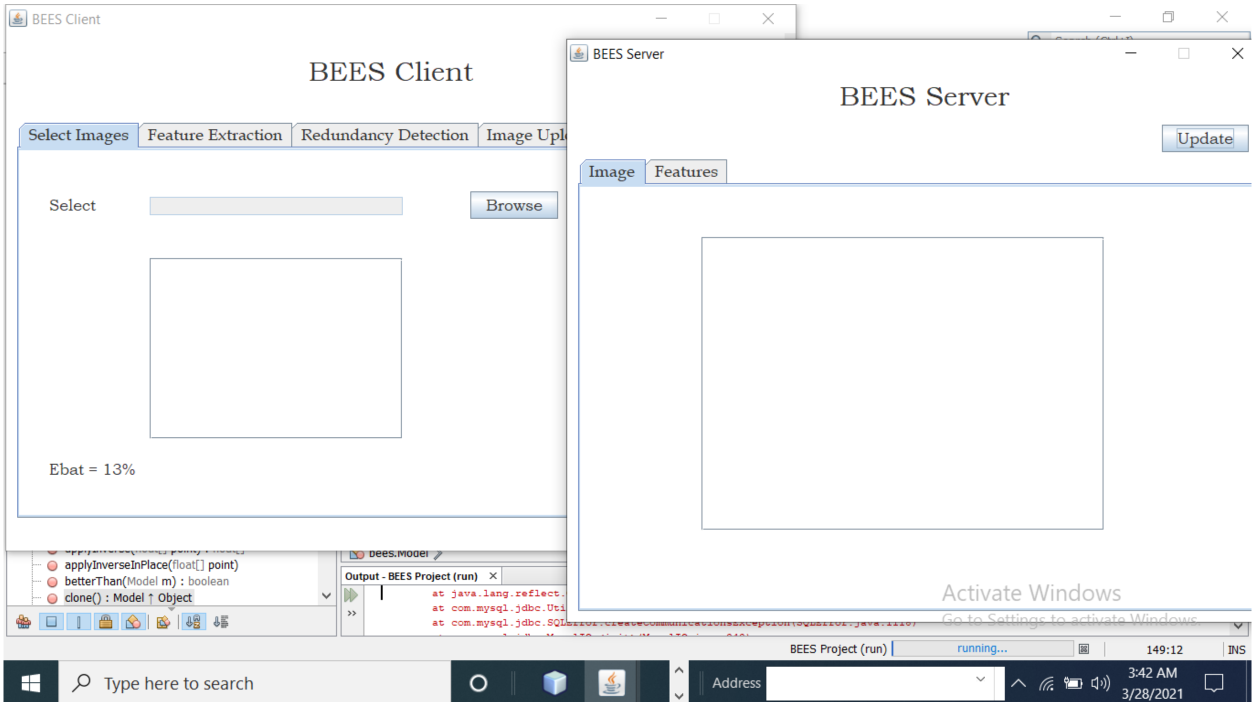
```
            .addComponent(jScrollPane2,
javax.swing.GroupLayout.PREFERRED_SIZE, 355,
javax.swing.GroupLayout.PREFERRED_SIZE)
            .addContainerGap(55, Short.MAX_VALUE))
    );

    jTabbedPane1.addTab("Features", jPanel3);

    jButton1.setFont(new java.awt.Font("Bookman Old Style", 0, 17)); //
NOI18N
    jButton1.setText("Update");
    jButton1.addActionListener(new java.awt.event.ActionListener() {
      public void actionPerformed(java.awt.event.ActionEvent evt) {
        jButton1ActionPerformed(evt);
      }
    })
    javax.swing.GroupLayout jPanel1Layout = new
javax.swing.GroupLayout(jPanel1);
    jPanel1.setLayout(jPanel1Layout);
    jPanel1Layout.setHorizontalGroup(
jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADIN
G)
      .addGroup(jPanel1Layout.createSequentialGroup()
        .addGap(298, 298, 298)
        .addComponent(jLabel1)
        .addContainerGap(javax.swing.GroupLayout.DEFAULT_SIZE,
Short.MAX_VALUE))
```

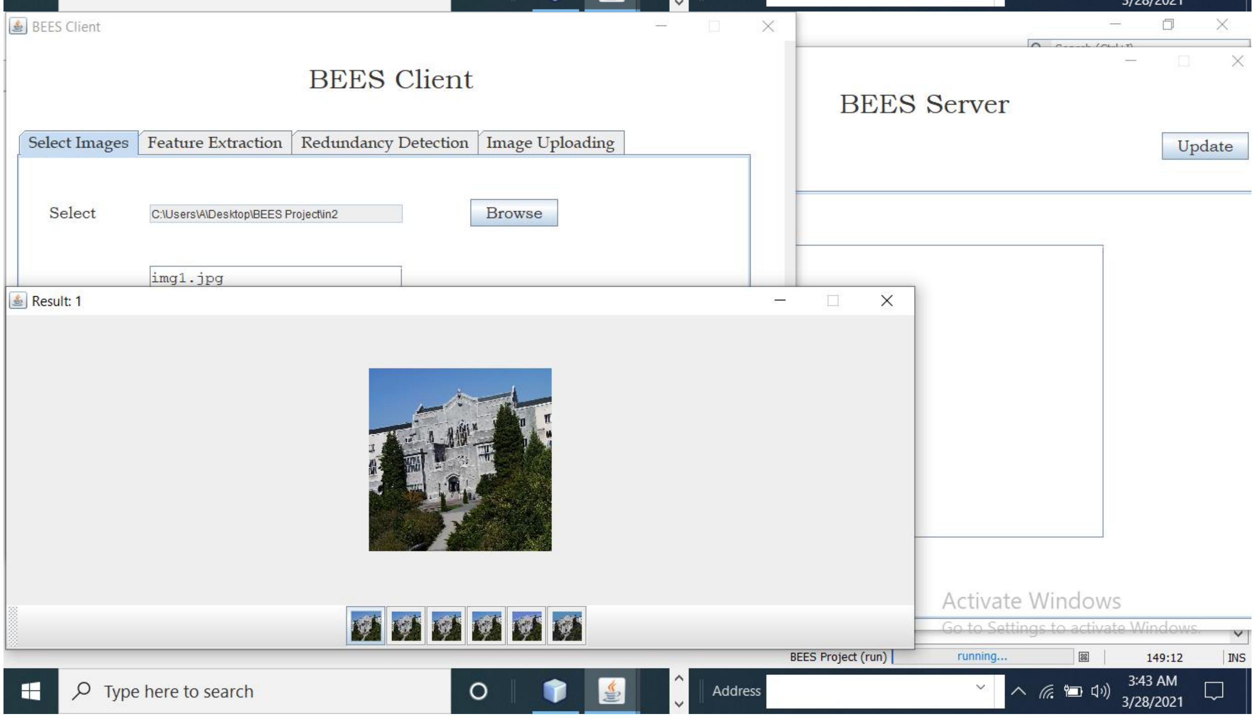
```
            .addGroup(jPanel1Layout.createSequentialGroup()
                .addContainerGap()
                .addComponent(jTabbedPane1)
                .addContainerGap())
            .addGroup(javax.swing.GroupLayout.Alignment.TRAILING,
jPanel1Layout.createSequentialGroup()
                .addContainerGap(javax.swing.GroupLayout.DEFAULT_SIZE,
Short.MAX_VALUE)
                .addComponent(jButton1)
                .addGap(18, 18, 18))
        );
        jPanel1Layout.setVerticalGroup(

jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADIN
G)
            .addGroup(jPanel1Layout.createSequentialGroup()
                .addContainerGap()
                .addComponent(jLabel1)
                .addGap(14, 14, 14)
                .addComponent(jButton1)

.addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
                .addComponent(jTabbedPane1)
                .addContainerGap())
        );
        javax.swing.GroupLayout layout = new
javax.swing.GroupLayout(getContentPane());
```

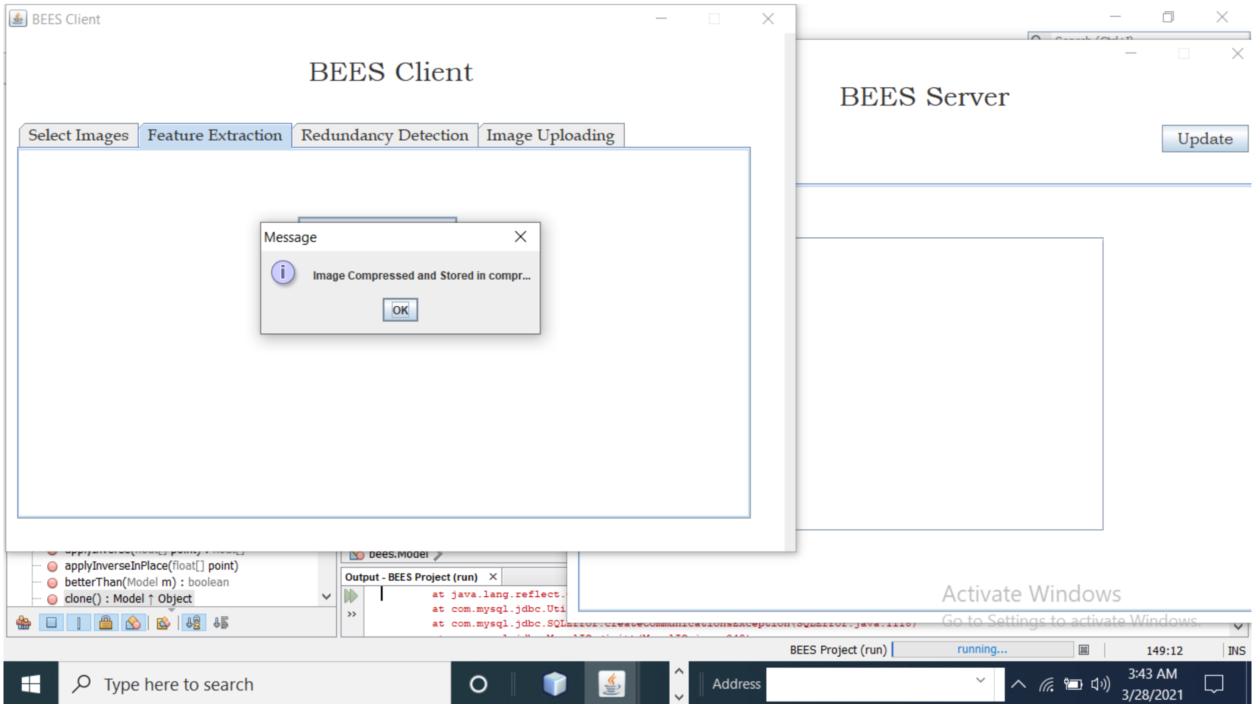
```
        getContentPane().setLayout(layout);
        layout.setHorizontalGroup(
    layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addComponent(jPanel1, javax.swing.GroupLayout.DEFAULT_SIZE,
            javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
        );
        layout.setVerticalGroup(
    layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addComponent(jPanel1, javax.swing.GroupLayout.DEFAULT_SIZE,
            javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
        );
        pack();
    }
    private void jButton1ActionPerformed(java.awt.event.ActionEvent evt) {
            display();
    }
        try {
            for (javax.swing.UIManager.LookAndFeelInfo info :
    javax.swing.UIManager.getInstalledLookAndFeels()) {
                if ("Nimbus".equals(info.getName())) {
                    javax.swing.UIManager.setLookAndFeel(info.getClassName());
                    break;
                }
            }
        } catch (ClassNotFoundException ex) {
    java.util.logging.Logger.getLogger(ServerFrame.class.getName()).log(java.util.log
    ging.Level.SEVERE, null, ex);
```

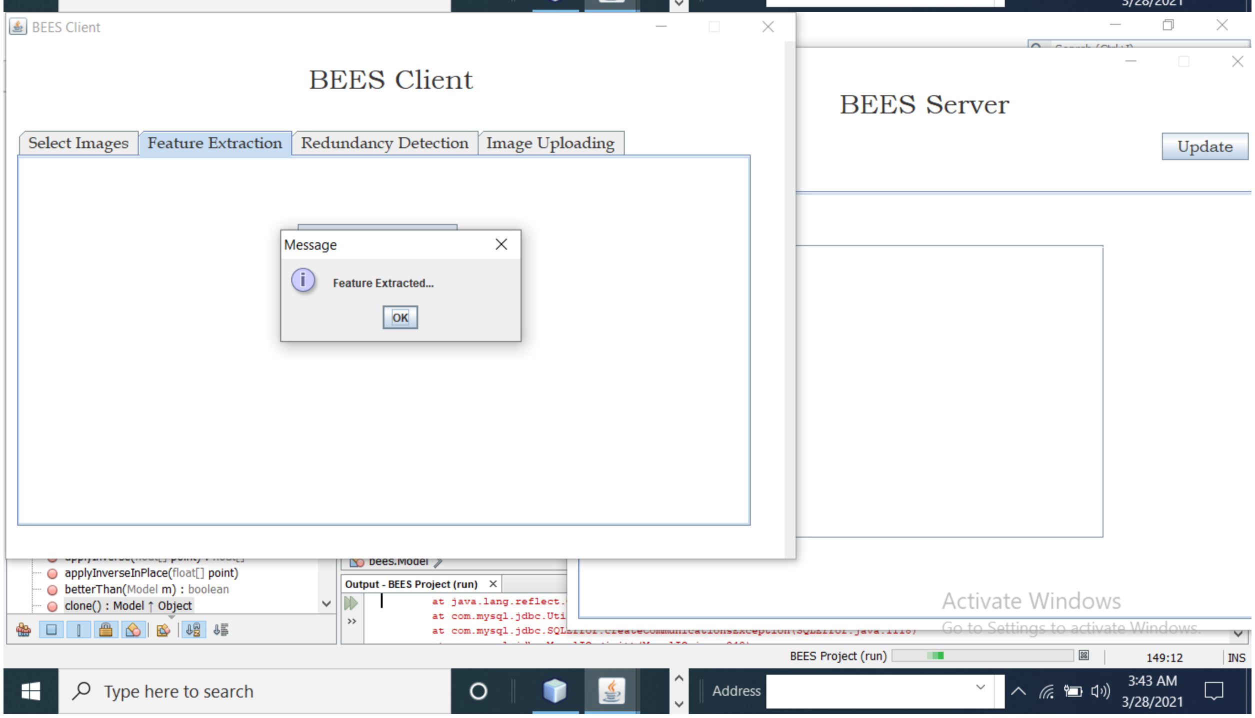
```
        } catch (InstantiationException ex) {
java.util.logging.Logger.getLogger(ServerFrame.class.getName()).log(java.util.log
ging.Level.SEVERE, null, ex);
        } catch (IllegalAccessException ex) {
java.util.logging.Logger.getLogger(ServerFrame.class.getName()).log(java.util.log
ging.Level.SEVERE, null, ex);
        } catch (javax.swing.UnsupportedLookAndFeelException ex) {
java.util.logging.Logger.getLogger(ServerFrame.class.getName()).log(java.util.log
ging.Level.SEVERE, null, ex);
        }
        java.awt.EventQueue.invokeLater(new Runnable() {
            public void run() {
                new ServerFrame().setVisible(true);
            }
        });
    }
    private javax.swing.JButton jButton1;
    private javax.swing.JLabel jLabel1;
    private javax.swing.JPanel jPanel1;
    private javax.swing.JPanel jPanel2;
    private javax.swing.JPanel jPanel3;
    private javax.swing.JScrollPane jScrollPane1;
    private javax.swing.JScrollPane jScrollPane2;
    private javax.swing.JTabbedPane jTabbedPane1;
    private javax.swing.JTable jTable1;
    private javax.swing.JTextArea jTextArea1;
}
```

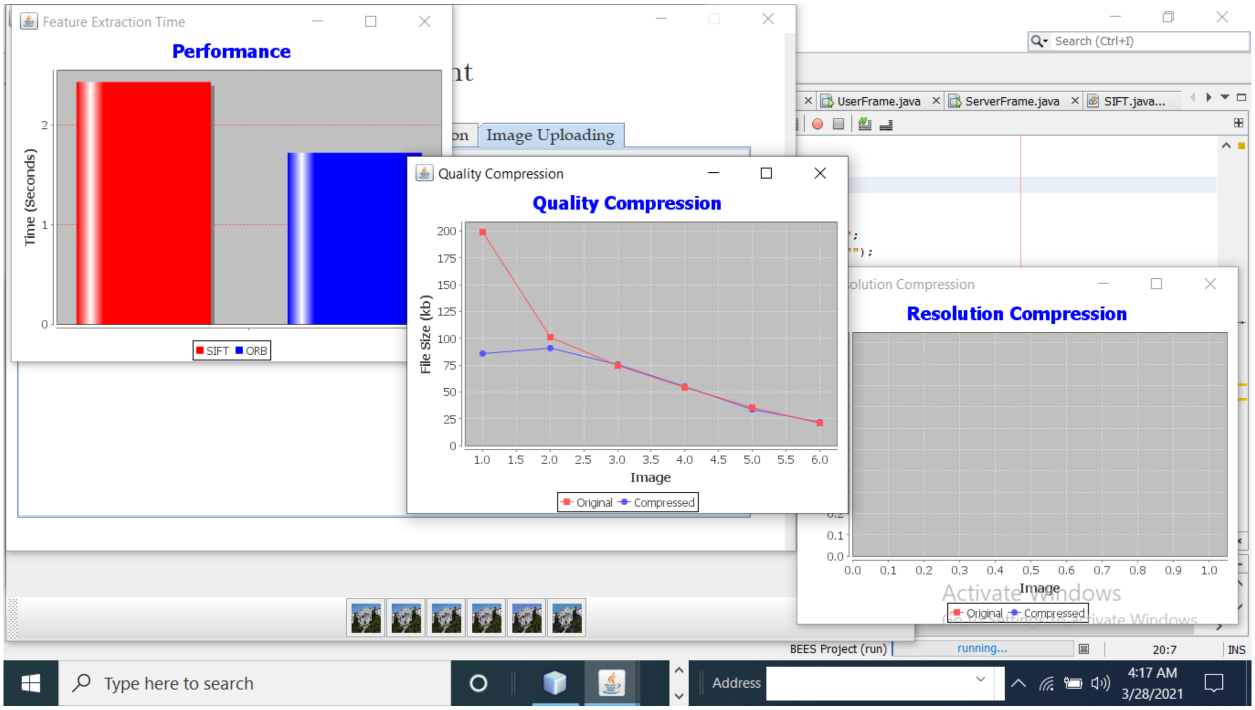
SCREEN SHOTS






BEES Client
BEES Client
Select Images
Feature Extraction
Redundancy Detection
Image Uploading
Message
Image Compressed and Stored in compr...
OK
BEES Server
Update
Activate Windows
Go to Settings to activate Windows.
BEES Project (run)
running...
149:12
INS
Type here to search
Address
3:43 AM
3/28/2021


BEES Client
BEES Client
Select Images
Feature Extraction
Redundancy Detection
Image Uploading
Message
Feature Extracted...
OK
BEES Server
Update
Activate Windows
Go to Settings to activate Windows.
BEES Project (run)
149:12
INS
Type here to search
Address
3:43 AM
3/28/2021



Feature Extraction Time
Performance
Time (Seconds)
SIFT
ORB
Image Uploading
Quality Compression
File Size (kb)
Image
Original
Compressed
Resolution Compression
Image
Original
Compressed
UserFrame.java
ServerFrame.java
SIFT.java...
Search (Ctrl+I)
BEES Project (run)
running...
Type here to search
Address
4:17 AM
3/28/2021

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PUBLICATION

1. Manoj N, Praveenkumar T P, Sanjeevinath M, Mrs.M.KNivodhini, Dr.A.Rajivkannan “Bandwidth Energy Efficient Image Sharing using CBRD Approach” ,Annals of the Romanian Society for Cell Biology (accepted on 30.03.2021,ISSN : 1583-6258) Scopus Indexing.