An Efficient Approach using SVM Image Classifier for CBIR

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Abstract— Popularity is growing in the field of multimedia and networking. Consumers are not satisfied with the traditional form of image retrieval systems. Content Based Image retrieval (CBIR) is done by using support vector machine (SVM) image classifier. Fast results are obtained using compared to other classifiers SVM is used to find out the optimal result. It also evaluates the generalization ability under the limited training samples. In this paper we explain the need of support vector machine and mathematically describes the proposed system i.e. optimal separating hyper planes and its other cases and at last shows the different kernel function for mapping purpose upon all the data samples. It helps in reducing sematic gap and sensory gap Image database contains about 1000 images from 10 different categories where 100 images corresponds to each category.

Key words: SVM, Image classifier, CBIR

I. INTRODUCTION

A. Content Based Image Retrieval

Content based image retrieval (CBIR), also known as queryby image content (QBIC) and content-based visual information retrieval (CBVIR) is the application of computer vision to the Image retrieval problem. "Content-based" means that the search will analyze the actual contents of the image. The term 'content' in this context might refers color, shapes, textures or any other information like similarity matrix which compare pixel by pixel value that can be derived from the image itself[1]. Creating the database by relevance feedback or by hand labeling each image is time consuming, costly and subjective. The end user query can meet both requirements by low level features such as color, shape etc. is challenging and hard to articulate. There is a need for an alternative algorithm support vector machine active learning to meet the user's requirements. The main issue with active learning is finding a way to choose informative images with in the large database to ask the user to label. To retrieve the required image user must at least meet two goals. First, the user must learn target concepts accurately. Second, the user must grasp a concept quickly. Support Vector Machine (SVM) is the technique used which combines active learning with support vector machine. SVM active regards the task of learning the target concept as of learning a SVM binary classifier. SVM separates the relevant images from Irrelevant images with hyper plane in projected space which is very high dimensional. The projected points on one side of hyper plane are relevant and others are non-relevant. The active part of SVM learns the most informative instances with which to train the SVM classifier. Once the classifier is trained, SVM returns the top k-most relevant

II. LITERATURE SURVEY

(1) Simon Tong and Edward Chang [1] proposed that Conventional Content-Based Image Retrieval (CBIR) schemes employing relevance feedback may suffer from problems like, most ordinary users would like to complete their search in a single interaction especially on the web as well it is time consuming. They proposed that using SVM algorithm by extracting image features would produce more effective results.

(2) Su Ja-Hwung (2011) [2] suggested that content based image retrieval is the mainstay of image retrieval systems. To be more profitable, relevance feedback techniques were incorporated into CBIR such that more precise results can be obtained by taking user's feedbacks into account. However, existing relevance feedback-based CBIR methods usually request a number of iterative feedbacks to produce refined search results, especially in a large-scale image database. This is impractical and inefficient in real applications.

III. METHODOLOGY

The earliest use of the term content-based image retrieval in the literature seems to have been by, to describe his experiments into automatic retrieval of images from a database by color and shape feature [1]. The term has since been widely used to describe the process of retrieving desired images from a large collection on the basis of features (such as color, texture and shape) that can be automatically extracted from the images themselves. The features used for retrieval can be either primitive or semantic, but the extraction process must be predominantly automatic. Retrieval of images by manually-assigned keywords is definitely not CBIR as the term is generally understood – even if the keywords describe image content. CBIR differs from classical information retrieval in that image databases are essentially unstructured, since digitized images consist purely of arrays of pixel

Intensities, with no inherent meaning. One of the key issues with any kind of image processing is the need to extract useful information from the raw data (such as recognizing the presence of particular shapes or textures) before any kind of reasoning about the image's contents is possible. Image databases thus differ fundamentally from text databases, where the raw material (words stored as ASCII character strings) has already been logically structured by the author. Image processing covers a much wider field, including image enhancement, compression, transmission, and interpretation. While there are grey areas (such as object recognition by feature analysis), the distinction between mainstream image analysis and CBIR is usually fairly clear-cut.

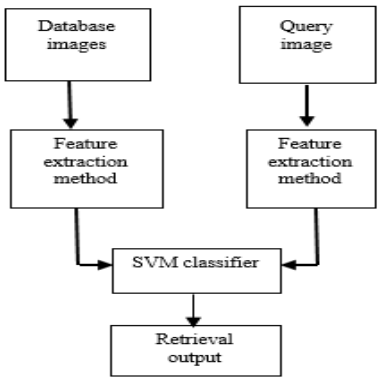


Fig. 1: block diagram of CBIR

IV. RESULTS

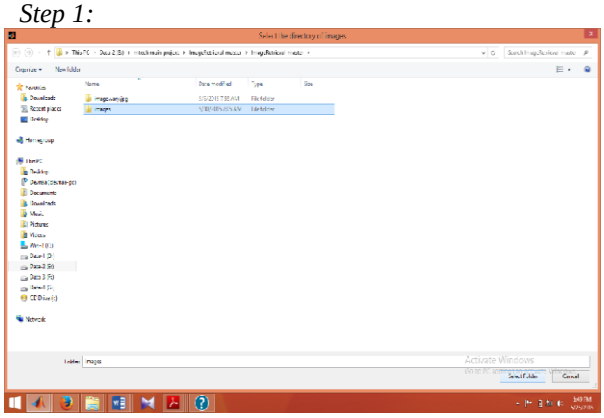
The database of images are taken from differentImage database contains about 1000 images from 10 different categories where 100 images corresponds to each category. The images are of different formats like .JPEG, .BMP and .PNG. Images are almost alike in background color, shapes and textures to achieve the accuracy of the technique used.

A. Steps involved in results:

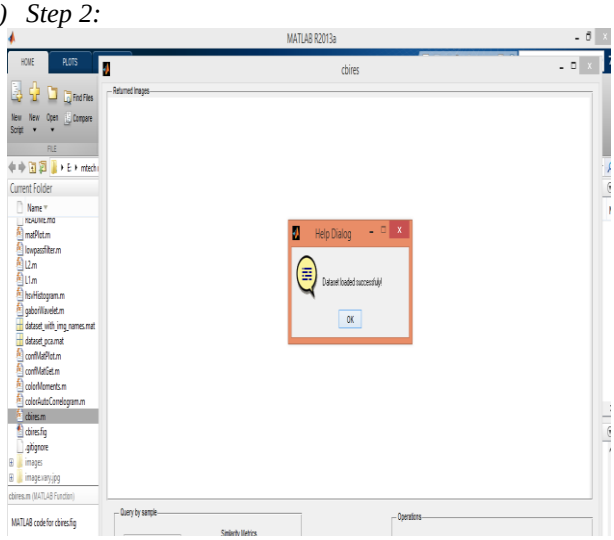
- Step1:Select directory for image processing
- Step2:load the database
- Step3: create the database of image features.
- Step4: select the query image
- Step5:select the image similarities
- Step6:select the number of return images
- Step 6: select SVM classifier

B. The CBIR GUI

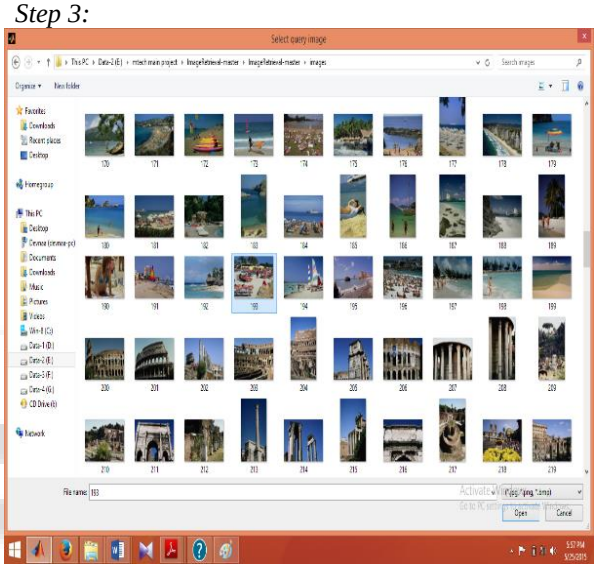
1) Step 1:



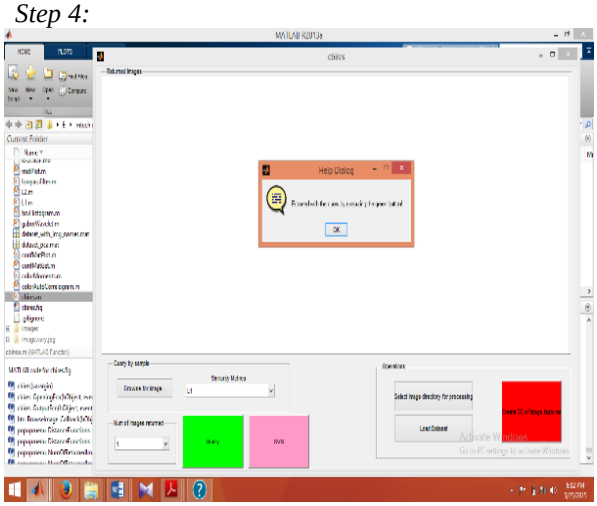
2) Step 2:



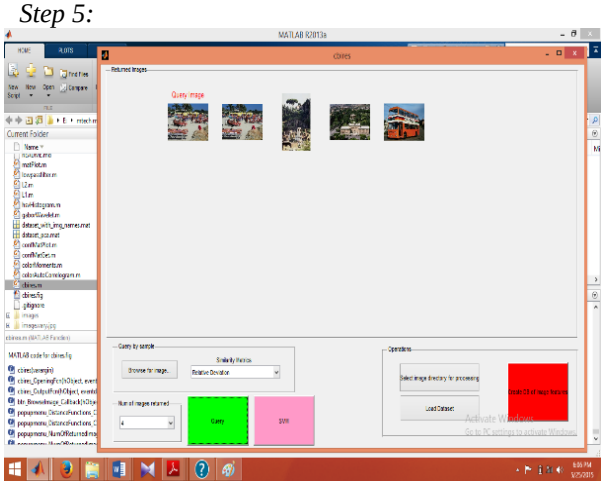
3) Step 3:



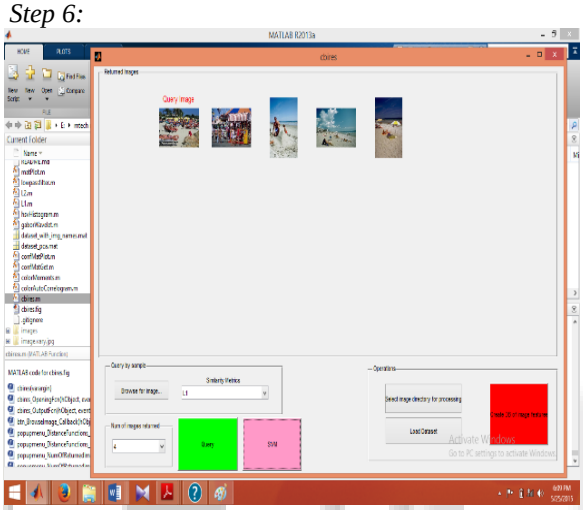
4) Step 4:



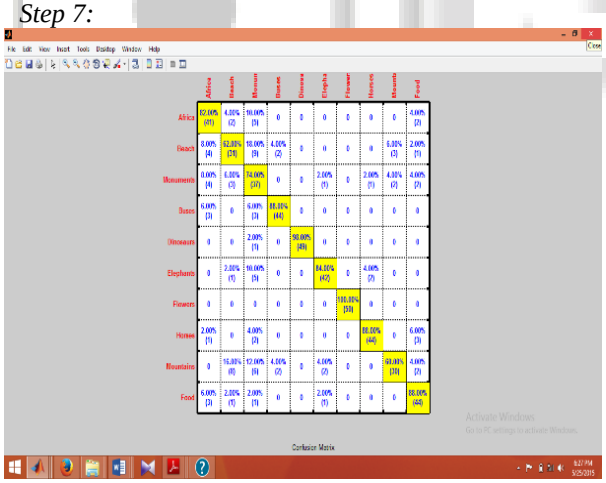
5) *Step 5:*



6) *Step 6:*



7) *Step 7:*



V. CONCLUSION

CBIR can be obtained using SVM Techniques with 90% accuracy,using SVM we get a confusion matrix different with different image similarities example with relative deviation and l2 normalization it is different.

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