Estimation and Distribution Algorithm for Feature Based Image Retrieval System

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Abstract— Categorization of context based on Shape, Texture, and Colour are needed in modelling approach. But characterization of Context requires prior contextual Information. This Dependency affects one another. Exploiting global image context categorization for semantic domain interface can be used to reduce the problem. A new colour image context categorization for semantic domain interface can be used to reduce the problem. A new colour image context categorization method is proposed based on the Trace Transform. By sampling the discrete Trace Transform the distortions are analyzed and the problem dimensionality is reduced. We also analyze the distortion produced by the parameters to determine the sampling of the trace transform. The Evaluation result show improved performance for content categorization without prior knowledge requirements.

Key words: Scalar Invariant Feature transform, Content Based Image Retrieval System, Trace Transform

I. INTRODUCTION

A. *Image Processing:*

Image processing is the form of signal processing for which the input is some image, the output is may be related to an image or a set of characteristics related to the image. The image processing techniques treating the image as a two-dimensional signal and applying some special standards signal-processing techniques. It usually refers to digital image processing. The two types of image processing are Analog and Digital techniques .Analog techniques use hard copies like printouts and photographs. Digital techniques use the manipulation of the multiple images. The Applications of Image processing are Computer Vision, Agricultural Applications, Face Detection, Medical Imaging, Microscope Image Processing and Pattern Recognition. Multimedia Image processing are electronic media devices is use to store the multimedia content. It is broadly classified into linear and non linear.

B. *Content Based Image Retrieval:*

This is especially relevant for big data intensive multimedia retrieval activities such as TV production and marketing. Many modelling approaches rely on the local low-level features.

C. *Trace Transform:*

The trace transform is derived from the radon transform. It is very useful for the semantic context classification. It consist of tracing an image with the straight lines along with certain functions are calculated.

II. RELATED WORKS

In [1] the main concept of this paper is Content-Based Image Retrieval (CBIR) based on colours and it is based upon the content image descriptor. The tool we developed in the retrieval system is 2D Gaussian distributions. It is based on weighted colour histograms. The main advantage is the system can automatically classify the image and provide the user with the most similar images to the reference image in its category. In [2] recognizing objects in images is an active area of research in computer vision. This approach is algorithmically attractive since it dispenses with the need for a prior step of individual object recognition. The drawback of this approach is that inferring the context becomes as difficult as detecting each object. In this paper we use a probabilistic framework for encoding the relationships between context and objects. In [3] it shows that visual attributes are a powerful approach for applications such as recognition, image description and retrieval. The advantage of this approach is that the frequency is very high. We also show that perceptual similarity of search results increases by using contextual attributes. In [4] the trace transform is a generalization of the Radon transform that allows one to construct image features that are the drawback of this approach is there is no similar reduction invariant to a chosen group of image transformations. We propose a methodology and appropriate functional that can be computed from the image function. It is used to calculate features invariant to the group of affine transforms. The advantage of both the trace transform method and the moments-based method are fast. The drawback of this method is when compares two images by exhaustive search it makes the process very slow. In [5] The trace transform is derived by the radon transform .It consists of Tracing an image with the straight line. And with the straight line the certain functions are calculated. The first major characteristic of the theory is that it allows the calculation of a very large number of features. The second major characteristic of the approach is that it can be very fast as it is parallelizable.

III. METHODOLOGY

A. *System Architecture:*

The overall process is shown in figure 1.

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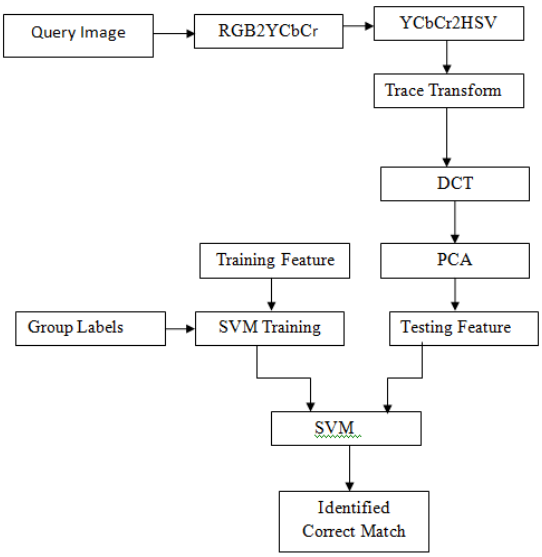

Fig. 1: System Architecture

B. Modules:

1) Sensor Modelling:

The first process is to transform the RGB colour space into Cyber. The luminance channel (Y) is used in more revalent channel to encode the related features. The Chrominance channel (Caber) is encoded by processing the colour distribution information. In order to reduce the effect the low pass filter is applied to each channel.HSV is encoded by obtaining the mean and the variance values (μ,α) for the intensity distribution in each HSV channel.

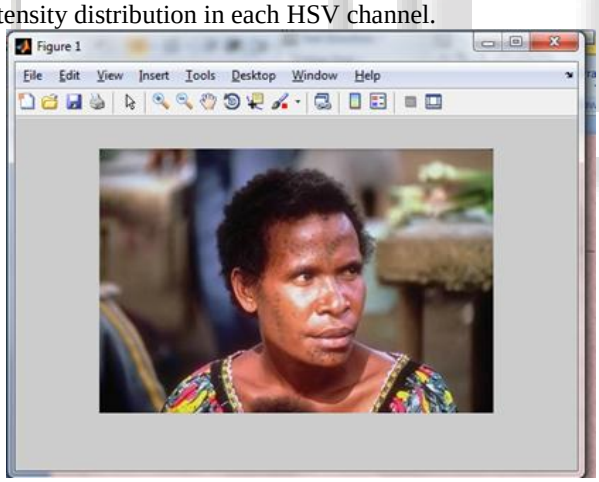

Fig. 2: Input Images

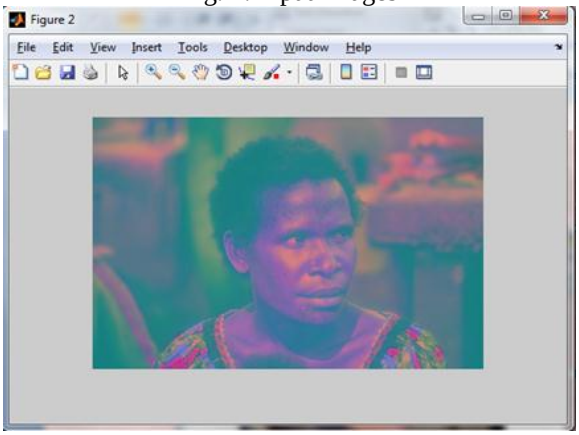

Fig. 3: RGB2YCbCr

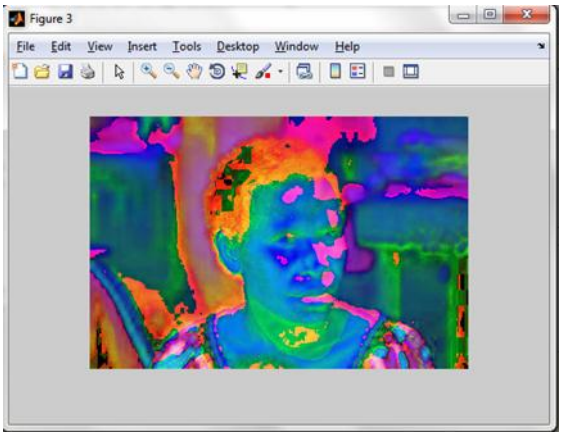

Fig. 4: RGB2HSV

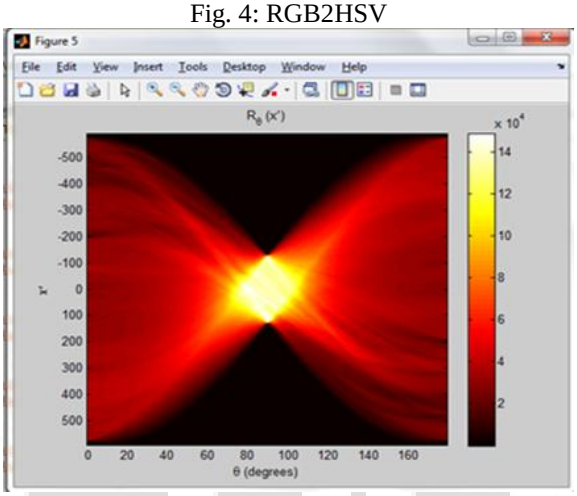

Fig. 5: Trace Transform

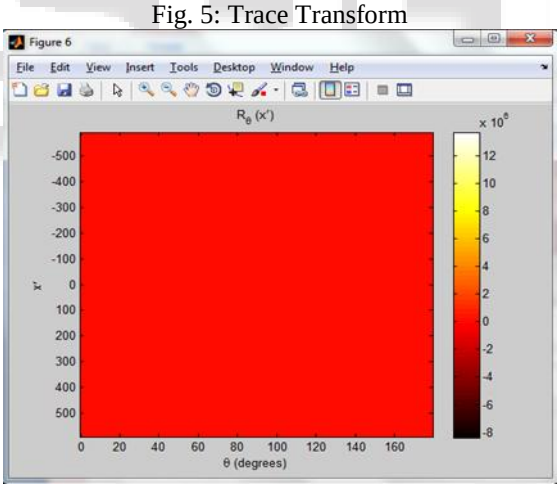

Fig. 6: DCT

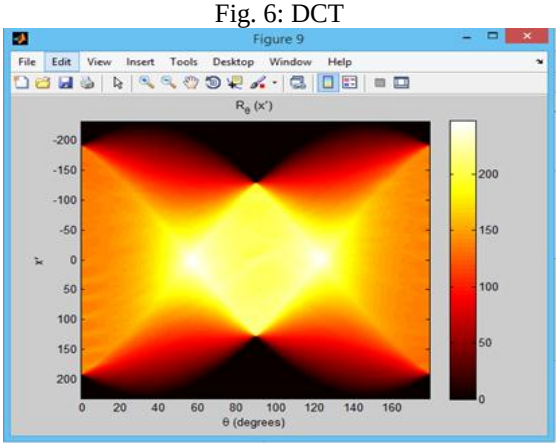

Fig. 7: PCA

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2) Feature Extraction:

Diametric and Circus transform have been used to reduce the set of descriptors. Sinograms are characterized by obtained by the trace transform. We propose the frequency analysis of the obtained signal and a representation based on statistical descriptor of the frequency distribution. To do this, Discrete Cosine Transform (DCT) is being applied due to its energy compaction and decorrelation properties**.**

3) Class Assignment:

After the feature extraction process a set of feature E is obtained .The dimensionality of E is reduced by Feature Subset algorithm .Exhaustive evaluation of the feature subsets has a high computational complexity .In this technique. The estimation Distribution Algorithm has been used in the end .The feature space has been processed with support vector machine (SVM).

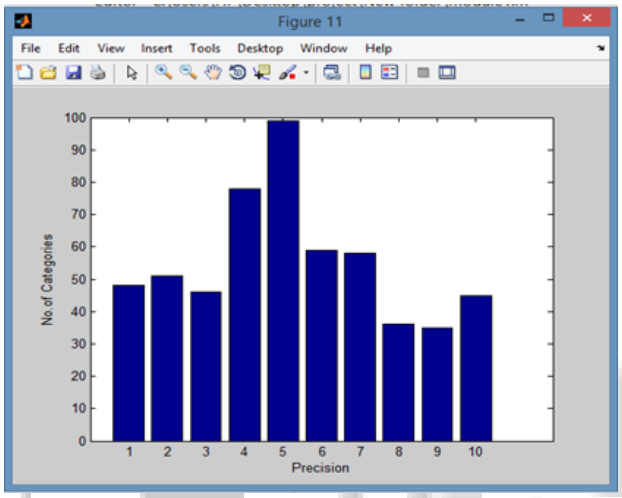

Fig. 8: Precision Graphs

IV. Conclusion

The method has been successfully identified the visual similarities .We have shown that the DITEC methods has a highly discriminate features for the categorization process. And also we have presented the geometrical constraints of the trace transform and it can be optimized to efficiently represent the information contained in the original image.

V. Acknowledgment

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