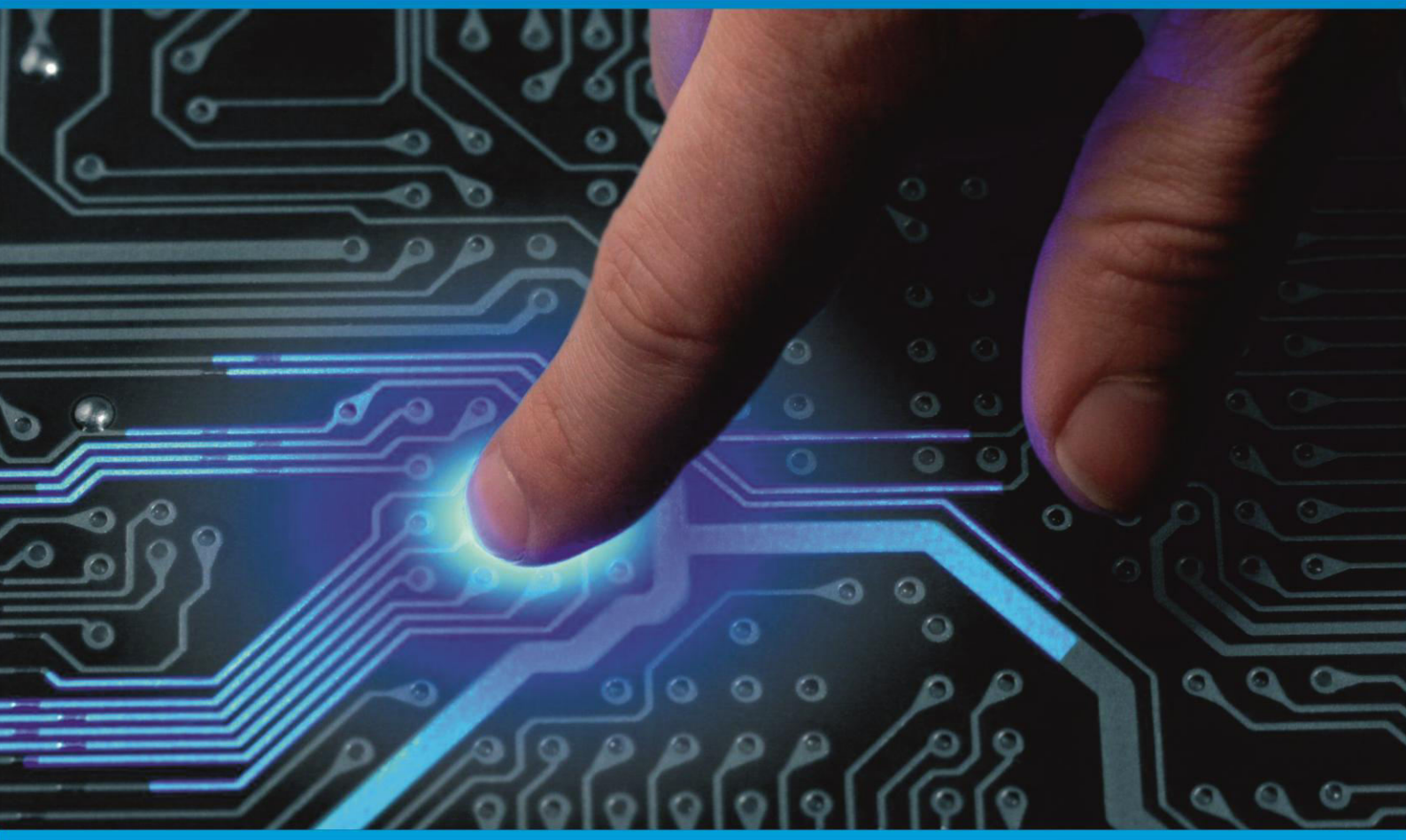
IJIRCCE

e-ISSN: 2320-9801 | p-ISSN: 2320-9798



INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

Volume 9, Issue 5, May 2021

INTERNATIONAL STANDARD SERIAL NUMBER INDIA

Impact Factor: 7.488

International Journal of Innovative Research in Computer and Communication Engineering

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | |Impact Factor: 7.488 |

|| Volume 9, Issue 5, May 2021 ||

| DOI: 10.15680/IJIRCCE.2021.0905134 |

Image Annotation using Content-based Image Retrieval

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ABSTRACT: Image Annotation using Content-based image retrieval (CBIR) used to overcome the huge amount of image classification to the problem of searching for digital image retrieval problem.Image Annotation would work on "Content-based" in which search will analyse the actual contents of the image of the database. The Content Data can refer to colours, shapes, texture, or any other information that can describe/derived from the image.

KEYWORDS: Content , Retrieval , Cosine, Feature, MPEG-7

I. INTRODUCTION

Deep Neural network needs a large-scale multi-label image database for visual representation learning, therefore annotating one image with multiple tags is much more time-consuming than annotating one image with a single tag, and it is difficult to control the annotation quality. For the multi-label image database, we used the MPEG-7 descriptors for extracting visual features, grouping the labels and images using K-means Algorithm, PCA Algorithm.

II. METHODOLOGY

The Proposed System Shows Image annotation Using the Following Algorithms in the System.

PCA

$$f(x,y)=\begin{bmatrix} f(0,0) & f(0,1) & \dots & f(0,m-2) & f(0,m-1) \\ f(1,0) & f(1,1) & \dots & f(1,m-2) & f(1,m-1) \\ \vdots & \vdots & \vdots & \vdots & \vdots \\ f(n-1,0) & f(n-1,1) & \dots & f(n-1,m-2) & f(n-1,m-1) \end{bmatrix}$$

1. Image Values are converted into a matrix of simple elements.
2. The covariance matrix C is calculated.
3. The Eigen values and the corresponding Eigen Vector are calculated.
4. The final data are obtained, that is, a matrix with all the eigenvectors (components) of the covariance matrix
   Final Data= eigenvector*C
5. Original Image is obtained from final data without compression. Original Data= C* Final Data

K-means

$$C = \sum_{i=1}^{N} t_{ip}$$

1. Compute the mean of each cluster.
2. Compute the distance of each point from each cluster by computing its distance from the corresponding cluster mean. Assign each point to the cluster it is nearest to.
3. Iterate over the above two steps till the sum of squared within group errors cannot be lowered any more.

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III. MODEL AND ANALYSIS

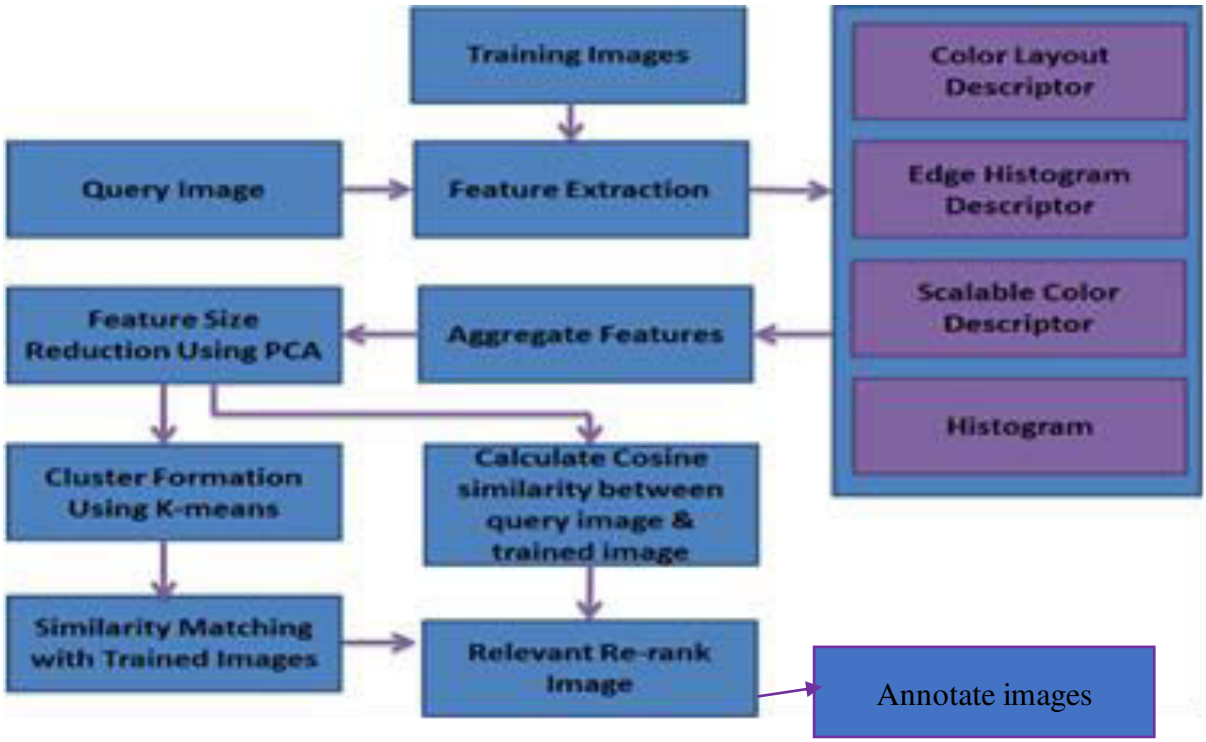

Figure 1: Proposed System

Testing

In a proposed system public dataset are used as Holidays to evaluate the retrieval quality.

Wedding: This dataset is a selection of personal Wedding photos (1491 images) from INRIA, containing a large range of scene types (Pre-Wedding, Mehendi Function, Haldi Function, Wedding Day and fire effects, etc.)., 500 of them being used as queries.

1) ***Level-1 Feature Extraction*****:**In level-1 Feature Extraction on the Image where the Image Pre-Processing on the Image and describes the relevant shape information contained in a pattern so that the task of classifying the pattern is made easy by a formal procedure.

2) **Level-2 Cluster Formation using K-means and Cosine:** In level-2 K-means and Cosine Algorithms which are been used to achieve accurate prediction related to image matching in the system. K-Means performs division of objects into clusters that share similarities and are dissimilar to the objects belonging to another cluster.

3) ***Level-3 Image Retrieval*****:**In level-3 Feature matching and feature extraction are been done image retrieval system, the set of texture features was extracted and incorporated into the NS domain to represent image content in the training dataset.

4) **Level-4 Relevant Re-rank Image**: Following is the Algorithm used for Image Annotation and Retrieval:

Let S be a technique for Image retrieval,
I is a set of images
Q is a Query Image and
F is a set of functions.
F1=Extract Features
F1 ={EHD, CLD,SCD}
F2= Feature Embedding
F3=PCA
F4= K means
F5=Training Dataset
F6=Retrieve Images by Query(Q)

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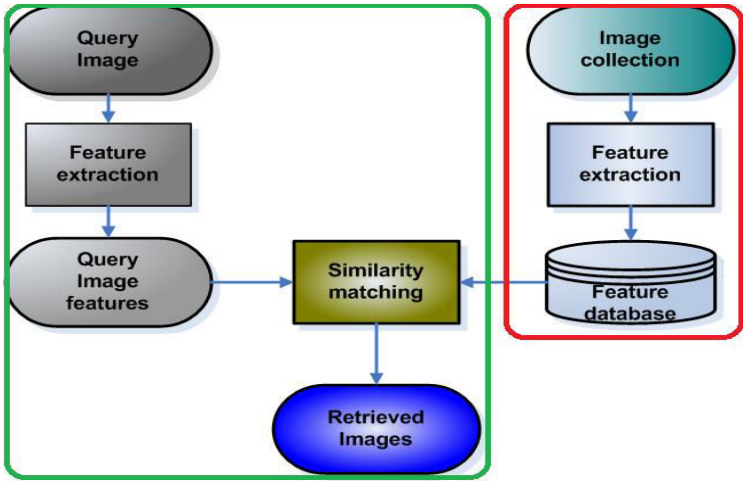
F7=Re-rank images
F8=Annotate Query image
O={O1,O2}
Where O is a set of Outputs
O1=Similar Image retrieve
O2=Annotated image

A. General framework of image retrieval system



Wedding Image datasets are used for experimentation

- The multiple features from these images are extracted using MPEG-7 descriptors along with local descriptors.
- The feature space is reduced using principle component analysis (PCA).
- By using embedding and aggregation, the impact of unrelated matches on the image similarity is reduced and interference between descriptors is controlled.
- Using Euclidean distance we calculate the similarity distances between visual features and provide efficient searching. (i.e. K-means algorithm is used for image clustering which improves the performance of image retrieval)

IV. RESULTS AND DISUSSION

This Project is based on database and image extraction. In this extract the features of image and train the image. In this we use one sensor like camera. We take one image as a input then it we extract the features of that image & detect the name of image means annotate the image(take the lable of image). In future work would be object detection.

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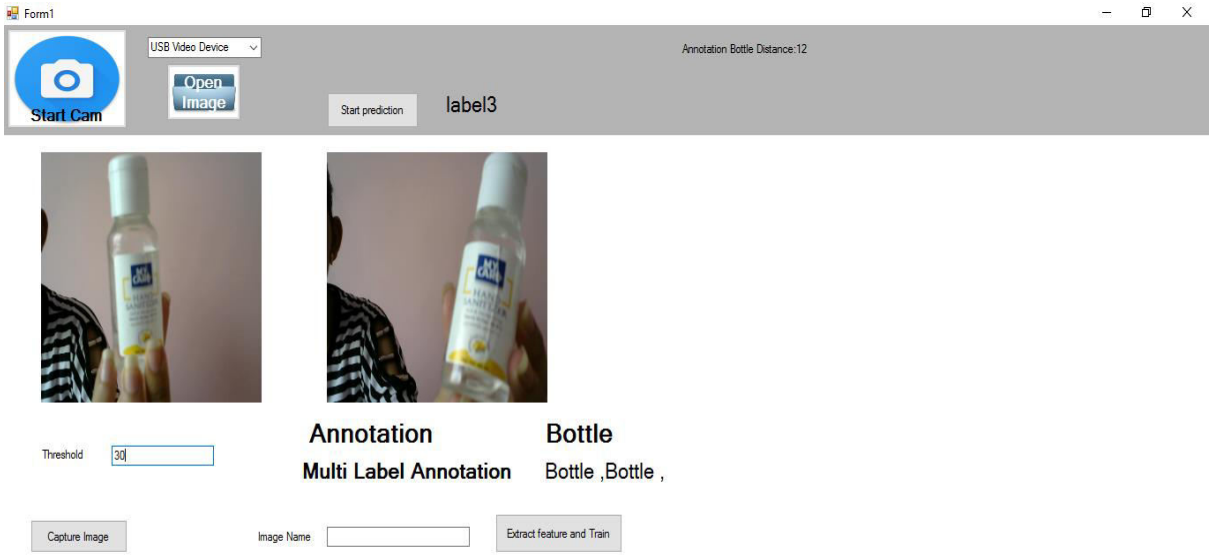

V. CONCLUSIONS

The proposed system provides compact image representation for large scale image retrieval. Initially the multiple features are extracted from an image using MPEG-7 descriptors along with local descriptors. Optimizing feature space using principle component analysis (PCA).

The Algorithm used K-means algorithm is used for image clustering which improves the performance of image retrieval. Use of cosine similarity provides better results as compared to Euclidean Distance Theory for Image Annotation.

VI. ACKNOWLEDGEMENT

The author wishes to acknowledge Mrs. G. R. Jagtap for guiding and other contributors for developing and maintaining Image Annotation files which have been used in the preparation Project.

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ISSN INTERNATIONAL STANDARD SERIAL NUMBER INDIA

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