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Visual Pattern Recognization Using Infographic Analysis

B. Anni Princy*, S. Gopi and M. Somaskandan*****

Abstract: Visual or video data mining which is in trend today and has a lot of scope to be implemented in real world scenarios provides a way to recognize, discover, and edit useful patterns from video files such as movie or any videos. The present world being fully digitalized consists of a variety of multimedia or video contents available so in order to have a profitable recognition of such contents the semantics plays an essential role. The semantics is the only valid and efficient part which could make the amateur editors know about the analyzing pattern for a video content in order to revise the video file. Another kind of classification based approach is also being used by assigning, each color with a unique class label, and uses this labels in video to construct video indices. The experimental results demonstrate the consequences and performance of our proposed approach.

Keywords: Video indices, video indexing, Database, Histogram.

1. INTRODUCTION

Large amounts of image data is being stored in databases and used widely every day. The successful retrieval of data is necessary in order to be able to use that part of data effectively. The today's system may be helpful in successful retrieval of text data but the case is not same with the images retrieval, for the efficient retrieval of the image various properties are used to retrieve the appropriate images irrespective of the image descriptions [1][2]. Our proposed system identifies the objects available in the images based on the colour distribution and performs a search. A colour info graph is generated and image segmentation is done to obtain the suitable images.

1.1. Video Indexing

In the method of video indexing a stream of input is provided as a video file and then the entire video is converted into video segments by using any of the existing tools which could be used for segmentation

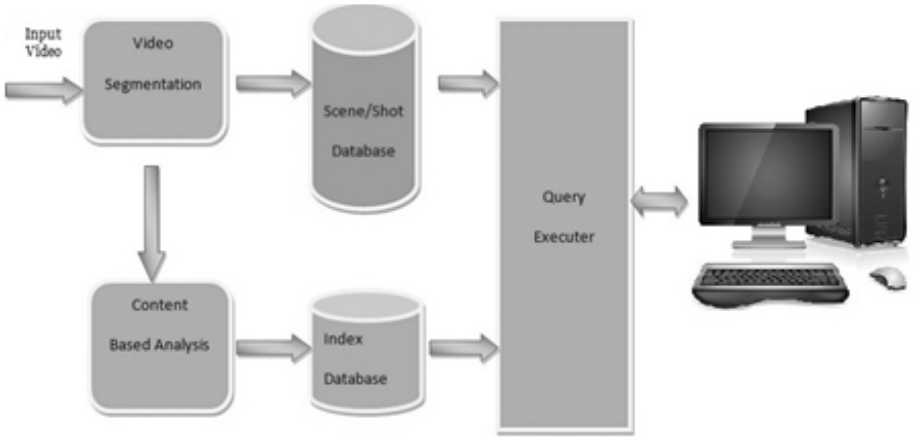

Figure 1: Video Indexing

* Professor Department of IT Panimalar Engineering College, *Email: shiyaprincy27@gmail.com*

** Assistant Professor Department of IT Panimalar engineering college, *Email: Gopikrishnaa75@gmail.com*

*** Assistant Professor Department of IT Panimalar engineering college, *Email: somaskandanm@gmail.com*

[3][4]. As shown in Fig 1 the segmentation is the process of diving each individual scene of the video into segments or pixels and each of the pixels or segments are stored in the database in the correct order or sequence of the video and then this database is accessed through the query processor and thus these segments are accessible to the user[5][6].

2. RELATED WORKS

2.1. PATTERN RECOGNITION APPLICATIONS AND AN OVERVIEW OF ADVANCES

The number of experts addresses the problem of pattern recognition and present basic concepts involved. One can find the evolution of pattern recognition [7]. This enables the reader to establish a categorization of the existing PRSs according to the used methodology and the application. Addressing the non-trivial concept of forgetting in the challenging field of machine learning in non-stationary changing environments [8]. This point of view is essential in on-line diagnosis when using medical imaging: indeed while dealing with PR in real world, the pattern being studied is subject to variation with respect to time. A possible solution is to continuously update the classifier. By doing so, the classifier must be able to "forget" the outdated knowledge. The idea behind this concept is to design an adaptive training system that is able to self-adapt itself accordingly to the changing of the pattern being studied. Pattern recognition is also applied in more complex fields like data mining (DM) also called knowledge-discovery in databases (KDD). This emerging topic includes the process of automatically searching large volumes of data for patterns such as association rules. As defined in earlier, the DM "is the nontrivial extraction of implicit, previously unknown, and potentially useful information from data [9]. Given a set of facts (data) F, a language L, and some measure of certainty C, we define a pattern as a statement S in L that describes relationships among a subset FS of F with a certainty c, such that S is simpler (in some sense) than the enumeration of all facts in FS. A pattern that is interesting (according to a user-imposed interest measure) and certain enough (again according to the user's criteria) is called knowledge. The output of a program that monitors the set of facts in a database and produces patterns in this sense is discovered knowledge".

The applications of PRSs in robotics are permanent. Recently a summary was also presented on this subject [10]. In this paper, they show that recent advances in computer vision have given rise to a robust and invariant visual pattern recognition technology based on extracting a set of characteristic features from an image. With visual pattern recognition systems, a robot may acquire the ability to explore its environment without user intervention. It may be able to build a reliable map of the environment and localize itself in the map: this will help the robot achieve full autonomy. Examples of robots using visual pattern recognition approaches are the Sony's AIBO ERS-7, Yaskawa's SmartPal, and Phillips' iCat. In robotics, visual servoing or visual tracking is of high interest. For example visual tracking allows, robots to extract themselves the content of the observed scene as a human observer can do it by changing his different perspectives and scales of observation. It was also addressed with some problem and solutions were proposed solutions in a closed loop system based on vision-based task [11]. It was proposed that various visual features based on the image moments to characterize planar objects in virtual-servings scheme [12].

2.2. Pattern Recognition in Biometrics

An interesting starting point to pattern recognition approaches and systems was proposed in biometrics [13]. This paper gives a brief overview of the field of biometrics and summarizes some of its advantages, disadvantages, strengths, limitations, and related privacy concerns. Later it was also addressed with the problem of the accuracy of the authentication and that of the individual's right to the security, to the privacy and to the anonymity [14]. The reader is encouraged to have a look on the article revealed [15]. The authors of this article address a problem of identity steeling through a true story and then they present some current or forthcoming systems based on biometric PRSs that will help prevent identity steeling.

2.3. Content-based Image Retrieval

Content-based image retrieval systems aim at automatically describing images by using their own content: the color, the texture and the shape or their combination. The image retrieval has become an active research and development domain since the early 1970s [16][17]. During the last decade the research on image retrieval became of high importance. The most frequent and common means for image retrieval is to index them with text keywords. If this technique seems to be simple, it becomes rapidly laborious and fastidious while facing large volumes of images. On the other hand, images are rich in content so, to overcome difficulties due to the huge data volume, the content-based image retrieval emerged as a promising mean for retrieving images and browsing large images databases.

2.4. An Overview of The Advances in Pattern Recognition

Presenting in a large panel of CBIR systems [18]. Various approaches of the state of the art in content-based image retrieval and video retrieval are explored along with the features used in each approach, they also describe the matching functions used. This overview enables to confirm, as it was said before, that commonly designed CBIR systems are generally based on visual features such as color, texture and shape. It also presented CIRES (Content-based Image Retrieval System), an online system for retrieval in image libraries [19]. It is done to extend the retrieval paradigm, which was mostly limited to color and texture analyses, by using image structure. Image structure was extracted via hierarchical perceptual grouping principles. A overview of the content-based retrieval was presented along with different strategies in terms of syntactic and semantic indexing for retrieval[20]. After an analysis of the matching techniques used and the learning methods the author addresses some directions for future research in the content-based retrieval domain.

3. THE PROPOSED APPROACH

3.1. Transforming Input Motion File

In our proposed approach for video file processing Applications the info graphic approach is being used. It uses motion info graph for video retrieval, clustering and classification. The duration of each of the slice of video can vary from 1 to 10sec and the total number of frames is 40.

The video or motion content to be sliced could be from a wide range of available formats and hence only the most reasonable data set from the video is put to test using the mobile info graph.

3.2. Frame Indexing

One of the important aspects for any kind of data retrieval is indexing of the frames, different types of systems that retrieve the work based on various algorithms and the retrieved image can be the same query image or a part of the query image or even objects in the image. There are a number of approaches to this for instance in one approach the search results in bringing the most similar image but not the real one, and sometimes they may produce two or more related images or even more. But the most significant drawback of such an approach is that its efficiency entirely depends on the capacity of the database.

3.3. INFO Graph Search

Info graphs represent a popular means for feature representation. A info graph is a colorful representation of a given data to make it the understanding quicker instead reading the whole analysis. This paper is concerned with the problem of exhaustive info graph-based image search. An extensive systematic empirical evaluation is presented that explores the computational and storage consequences of altering the search image and info graph bit sizes. As shown in Fig. 2. Experiments reveal up to an eight-fold decrease in computation time and hundreds-to thousands-fold decrease of memory use of the proposed distributive info graph in comparison to the integral info graph.

In general any image contains useful and unwanted information. As shown in Fig. 2 the system has to differentiate between the both. Consider the below image where the person reading a book is the useful information and the background, people and the market is the unwanted data. The system has to group together the repeated pattern to identify the objects in the image. As shown in Fig. 3 for example below is given the part of the shirt and this pattern is repeated again.

As shown in Fig 4 the basic concept behind the info graph generation is simple. Each arrival per second in the image is scanned and the respective color or intensity value is obtained for the frequency.

$$iPixel = (16 * P1[0]) + P1[1] * 4 + p1[2];$$

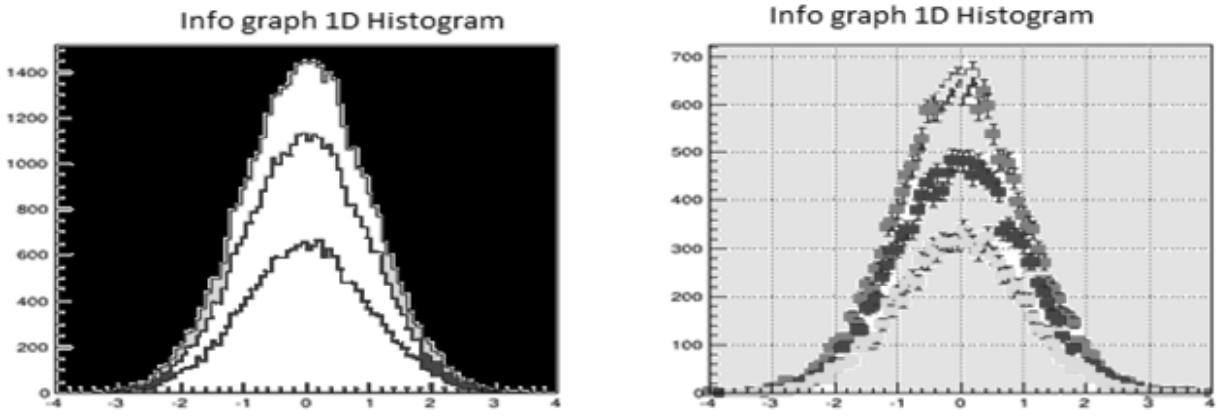

Figure 2: Color Info graph Representation

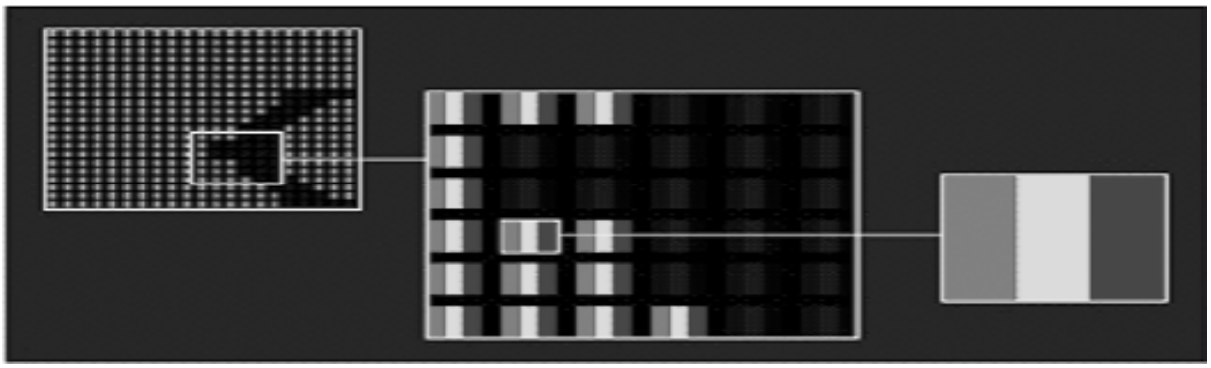

Figure 3: Zooming on a certain pattern

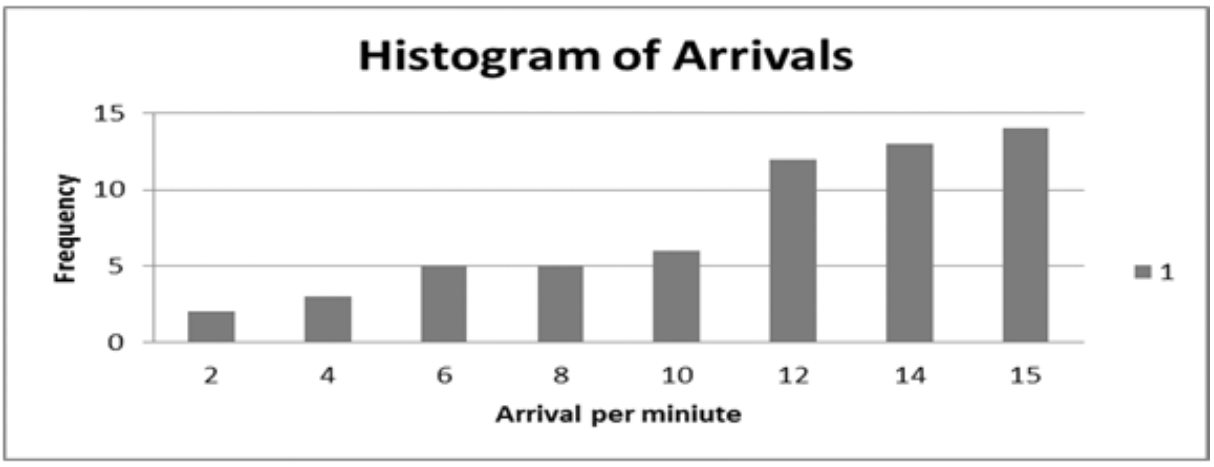

Figure 4: Example for info graph

Then finally a graph is generated with total number of arrivals per minute against the frequency value. An array variable is chosen to store the different frequencies and the counter increases for each repeated intensity counting the total number of occurrences of that particular color or intensity.

$$\text{Infographarr [iPixel]} = \text{Infographarr [iPixel]} + 2$$

4. EXPERIMENTAL RESULTS

The analysis was finally done to obtain the efficiency of the results, one for assessing computational performance, and one assessing robustness with respect to validate the methods we have described, we implemented the components of the video frame based retrieval system and tested with a general purpose image database including about 700 videos. The table given below shows the time taken for Splitting Number of frames from the image database.

Table 1
Average Search Time

Number of Frames Spitted	*Search Time*
200	3 Seconds
500	7 Seconds
1200	15 Seconds

This system used for the calculation is written by using the VB programming language and the compilation of the same is done using the windows platform. The images are of resolution 720 × 340 or 340 × 720. The below provided table represents the indexing results by indicating the number of frames from videos.

Table 2
Average Search Time for a Particular Frame

Number of Frames	*Search Time*	*Videos*
15764	3 Seconds	Cricket
29464	7 Seconds	Car Reviews
84568	15 Seconds	CCTV footage
14464	3 Seconds	Cartoons

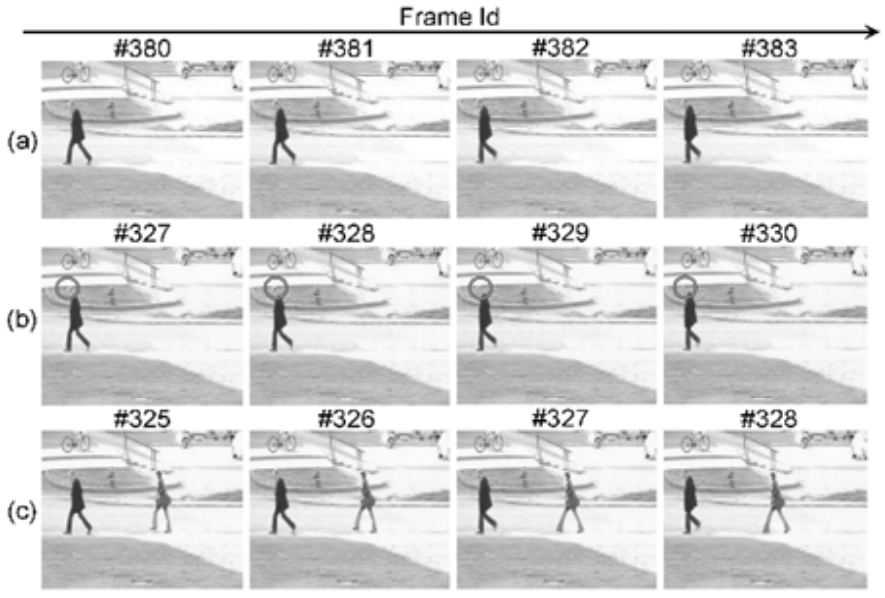

Figure 5: Model Input Frames

5. CONCLUSIONS

Thus in the above research conducted by us the urgent need for an efficient and reliable video based indexing and Video Frame based Retrieval has been experimental and the various issues in the currently existing system has also been discussed and keeping in mind the whole experimental research a whole new system has been proposed for different types of Video Frames and the structure of the Frames and the way they are indexed and stored inside the database. The new approach has proved to have a whole better method for much effective pattern recognition this system can be used to process a wide range of various types of images as well as video files. The comparison made has proved an exotic technique for a more capable and depth recognition of video patterns.

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