LOGO MATCHING AND RECOGNITION IN VIDEO

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***Abstract*-We present a method for detecting the logos from videos. We first include a basic feature-matching algorithm using SIFT, nearest-neighbor matching and RANSAC. Large numbers of features can be extracted from typical images .The features are unique, which allows a single feature to be correctly matched with large database of features, providing a base for object and scene recognition. . Video can easily be divided into frames. These individual frames can be used as input images to check against reference logos from archive. As output count of all logos appearing in the video can be displayed.**

***Keywords*- Context-dependent kernel, logo recognition, logo detection.**

I. INTRODUCTION

In industry, logos are often connected with quality and standard of the product or services. Logos generate sense of faith and genuineness among consumers. Today lot of products in consumer market uses logos similar to famous brands. Products with fake logos may not provide facilities as original well-known brands which may lead to consumer disappointment and bring foul name to original renowned brand.

Large production of data from companies and growing popularity of social websites like Twitter, Facebook and YouTube for sharing images and videos forces to do research effectively to provide solution for object recognition and detection to support the annotation of video and image. In industry logo plays an important role. Logos set the expectation of people with the certain product or facilities. Because of this, companies are now requesting smart image analysis solutions to scan the logo archives and find the evidence of similar existing logo to avoid the misuse of logo. Logos are the graphic production which highlight a name or recall some real world object or simply display some abstract sign that have strong appeal

The graphic layout is vital in logo to capture the attention of the people and convey the message. Different logos may have same layout with small changes in position of the graphic features, changes in the shape and size or in the case of mischievous tampering differ by missing few individualities [see Fig 1.]

Fig 1.Pairs of logos with small changes in details or spatial arrangement [1].

Logos often appear in t-shirt of players, billboards of the shop and posters in the sport stadiums. In many cases this logos are subjected to alterations corrupted by lighting or noise effect. Such logos and images have relatively low resolution and quality. Logos included in region contain few information and might be small. In these case logo recognition and detection has become important for a number of applications. Logo detection in broadcast video of sport is challenging Problem many firms invest large amount of money in sport marketing cost of these investment is high so sponsors require verification of how many time their logo appeared in order to evaluate return of their investment.

Logo detection in broadcast video of sport event is challenging and interesting problem .Many firms invest large amount of money in sponsorship and sport marketing. This investment include trademarks, logos in the form of object such as banner, billboards. It is placed within an area in which sport event is carried out such as volleyball or basketball court, golf course etc. As the cost of investment is very high sponsors need verification of visibility of their logos or trademark in order to evaluate the return of their investment. The early work on logo detection was to provide support to

logo registration process the system must check whether new coming logo image have the similar appearance to the other registered logos in achieve of millions in order to avoid the confusion and to ensure that it is distinctive.

II. REVIEW OF LITERATURE

Hichensahib[1] present a method which is able to match and recognize the logo stored in an image achieve. they used the SIFT descriptor and proposed CDS algorithm (Context dependent similarity) in which Input is reference logo, test images and CDS parameter and output is Boolean value which determine whether the reference logo is detected in test image, reference logo and text image are seen as interest point and are match by minimizing energy function mixing 1) fidelity-which measures the quality of matching 2) neighborhood captures the object geometry 3) entropy. It present solution for logo detection and recognition which follows the definition of "context Dependent similarity" kernel. Context is used to find the interest point between two images. We compare proposed CDS matching algorithm with SIFT matching and nearest neighbor SIFT matching against RANSAC. Reference logo is detected in test image if number of SIFT matches is above threshold. SIFT match is obtained by computing each interest point in one set Sx its Euclidean distance to all interest point in other set.Sy. Where Sx and Sy be the list of interest point taken from reference logo and test image. RANSAC follows the same idea but it introduces some criterion. This criterion select only this matches that satisfy affine transformation between test image and reference logo.

C. Constantinopoulos, E. Meinhardt-Llopis, Y. Liu, and V. Caselles[4]proposed the method for detecting logos in low resolution video. The ethod is based on matching SIFT descriptor. The logos are stored in database. The proposed scheme consist of two layers, the low level and high level. The lower level operates on each frame. At lower level we detect number of logos possible on each freame. At high level we process the video three times, firstly we detect logos based on target image, in second pass we detect logos based on logo instance detected previously finally we keep the track of all instances detected in order to retrieve missing detection.

Andre Filgueiras de Araujo, Stephanie Pancoast proposed the method for Logo detection in high-motion sports video. We first incorporate a basic feature-matching algorithm using SIFT, RANSAC. The proposed system consist of two parts Basic algorithm and extended. This stage basically matches each frame to the original logo separately. The Extended Algorithm is a second pass over the results of the Basic Algorithm, aiming to propagate the matches that were initially detected.

D.Lowe[3]presents a method for extracting invariant features from images which can be used to perform matching between different views of an object or scene. The features are invariant to rotation and image scale, and provide matching across a large range of affine alteration, addition of noise. The features are highly unique that a single feature can be correctly matched against a large database of features from many images. For image recognition and matching SIFT features are extracted from reference image set and stored in database. A new image is matched by matching each feature of the new image to this previous image and find matching features which are based on Euclidean distance of feature vectors.

Shalin A. Chopra tells about OCR system for offline handwritten character recognition. The systems have the ability to yield excellent results. Handwritten character recognition. OCR is the machine replication of human reading. It is the mechanical or electronic conversion of scanned I mages where they can be handwritten, typewritten or printed text. It is a method of digitizing printed texts so that they can be electronically searched and used in machine processes. It converts the images into machine-encoded text that can be used in machine conversion, text-to-speech and text mining.

Hongye Wang [5] presents a simple, dynamic approach to logo detection and recognition in document images. Current methods lack the adaptability to variable real-world documents.it initially observe this absence from a kernel methods including support vector machines (SVMs) are different point of view and reveal its inherent causation. Then it reorganize the structure of the logo detection and recognition procedures and integrate them into a unified framework. Experiments show that the proposed method outperforms existing methods in document processing domain.

III. PROPOSED METODOLOGY

Early work on logo detection and recognition was to provide support to logo registration process. The system must check whether other registered logo in archives, exist that have same appearance to the new coming logo image to ensure that it is unique and avoid confusion. We present the method for detecting logos from video, Firstly we use OCR(optimal character recognition) technique for text detection, which detect the text from an input image. In proposed system the process consists of following processing steps: (1) Scanning of Image, (2)Pre Processing of Image (3) Character Extraction (4) Feature Extraction and Recognition (5) Post-Processing.

A. Pre Processing

The image is taken and is converted to gray scale image. The gray scale image is then converted to binary image. This process is called Digitization of image

B. Character Extraction

The pre-processed image serves as the input to this and each single character in the image is found out [13].

C. Recognition

The image from the extraction stage is correlated with all the images which are preloaded into the system. Once the correlation is completed, the image with the maximum correlated value is declared as the character present in the image. [13]

D. Post Processing

After the recognition stage, if there are some unrecognized characters found, those characters are given their meaning in the post-processing stage. Extra templates can be added to the system for providing a wide range of compatibility checking in the systems database [13].

Then SIFT(scale invariant feature transform) is used to extract the feature of both input image and image stored in database. The features are unique, which allows a single feature to be matched against a large database of features, providing a source for object and scene recognition. Following are the major stages of computation used to generate the set of image features:

1.Scale-space extrema detection: The first stage of computation searches over all scales and image locations

2.Key point localization: At each candidate location, a detailed model is fit to determine location and scale

3.Orientation assignment: One or more orientations are assigned to each key point location based on local image gradient directions.

4. Key point descriptor: The local image gradients are measured at the selected scale in the region around each key point. These are transformed into a representation that allows for significant levels of local shape distortion and change in illumination. This approach has been named the Scale Invariant Feature Transform (SIFT), as it transforms image data into scale-invariant coordinates relative to local features. For logo matching and recognition, SIFT features are first mined from a set of reference images and stored in a database. A new image is matched by independently comparing each feature from the new image to this previous database and finding candidate matching features based on Euclidean distance of their feature vectors.

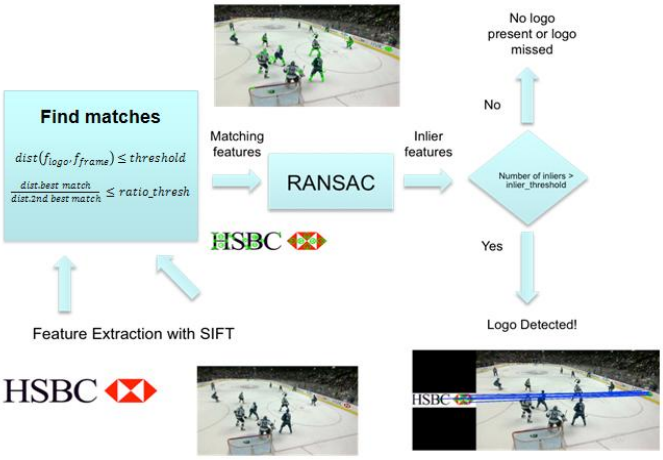

Fig 2: Data flow Diagram

IV. CONCLUSION

This paper contains the work on logo detection and recognition which is based on context. By using proposed algorithm we will achieve better logo matching. We can also use this proposed system for detecting logos from video. Video can easily be divided into frames. These individual frames can be used as input images to check against reference logos from archive. As output count of all logos appearing in the video can be displayed.

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