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PERSON IDENTIFICATION BY SEGMENTATION AND SALIENCY LEARNING

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Abstract:-Human eyes can identify person identities based on small salient regions, i.e. person saliency is distinctive and reliable. Saliency relates to matching regions with attributes that make a person distinctive and are useful in finding the same person across different camera views. Person re-identification with saliency learning can be applied in human tracking, surveillance, retrieval , oobject selection etc.

Keywords: Salient region, PCA-SIFT, edge based segmentation, filter

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I INTRODUCTION

Person re-identification is matching individual images observed from different camera views based on image appearance. Person re-identification can be defined as the task of assigning the same identifier to all the instances of the same object or, more specifically, of the same person, by means of the visual aspects that have been captured and extracted from an image or a video. With this premise, person re-identification aims to answer questions such as "Where have I seen this person before?" [Zajdel et al. 2005], or "Where has he gone after being caught on this surveillance camera?". Re-identification works on the exterior appearance usually acquired by noisy cameras, which makes impossible to extract and associate precise measurements such as biometric features. It is useful in video surveillance such as human retrieval, human tracking, and activity analysis. Due to variations in background light conditions, blurr image, clutter, occlusion etc. intrapersonal variations become more important to deal with. Person identification with salient regions helps in dealing and overcoming theses difficulties.

Salient region could be a body part or any object or accessory in the image. In this paper, saliency means regions with attributes that 1) differentiate a person against other distractions, and 2) are worthy in finding the same person across different camera views [1]. Salient regions are not limited to body parts, but also include things or accessories used by people. They are often considered as outliers and removed in existing approaches. With the aim to improve the performance of re-identification, person saliency is considered as visual patterns that distinguish a person from others, while general saliency draws visual attention within a single image to capture salient foreground objects from background. Surveillance in public places is widely used to monitor locations and behavior of people in those areas. Person re-identification is useful in processes needed for activity analysis and event recognition or scene analysis. For tracking the same person in different cameras, the system must be robust to illumination changes and clutter.

II. LITERATURE SURVEY

Zhao et.al used Dense feats. for person identification with saliency. Dense correspondence between images is first built with patch matching. To find similarity of patches Euclidean distance is used and then K-nearest Neighbour or One-Class SVM are used to find person saliency. KNN is capable in finding person saliency. By searching the K-nearest neighbours of a test patch a set of matched patches is obtained with dense correspondence. In one-class SVM, the support vector model is trained on data that has only one class, which is the "normal" class. It infers the properties of normal cases and from these properties predicts which examples are unlike the normal examples. [1]

Regions that are salient in human images provide important information for identification. Humans routinely judge the importance of image regions, and focus attention on important parts. Computationally detecting such salient image regions is a significant goal, as it allows preferential

allocation of computational resources in subsequent image analysis and synthesis.

A. Saliency matching

Saliency originates from visual uniqueness, unpredictability and is often attributed to variations in image attributes like colour, gradient, edges, and boundaries. Visual saliency, being closely related to how we perceive and process visual stimuli, is investigated by multiple disciplines including cognitive psychology, neurobiology, and computer vision. In this dissertation, saliency means regions that differentiate a person against potential distracters and are worthy in finding the same person across camera views.

B.Descriptor:

PCA-SIFT descriptor is a vector of image gradients in x and y direction computed within the support region. High dimensions are challenging and causes redundancy. It is natural to try to reduce dimensionality. It helps in reducing dimensions. PCA-SIFT does not reduce the SIFT feature vector, but the dimensions of the detected interest points. That is, PCA-SIFT uses only the SIFT detection stage and then applies its own description stage.[8]

III METHODOLOGY

For edge based segmentation which is the pre-processing step followed by video and image saliency. After selecting image Euclidean, hue,lumino, average etc. parameters then based on them segmented image is obtained in result.

Figure 1. Euclidean

Euclidean filter uses Euclidean distance to give segmented image

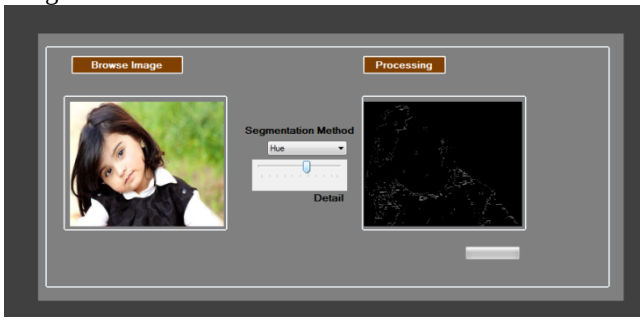

Figure 2. Hue

Hue is usually presented by position significance. Mainly of the missing edges consequence from hue changes. So to detect missed edges we apply hue analysis to color image

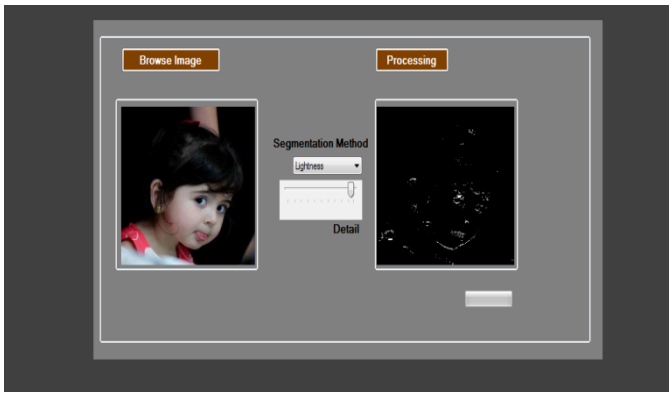

Figure 3. Lightness

Lightness as the name suggests does segmentation base brightness. Lightness is perceived brightness relative to average level in an image or environment.

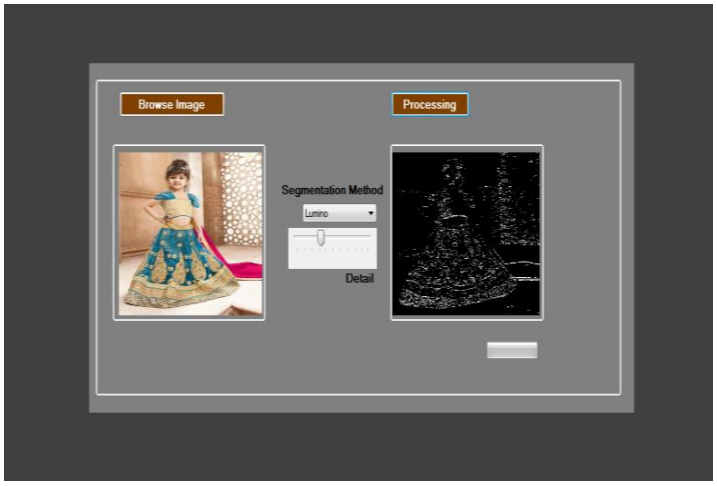

Figure 4. Lumino

Luminosity refers to the perceived brightness of that object by a human observer.

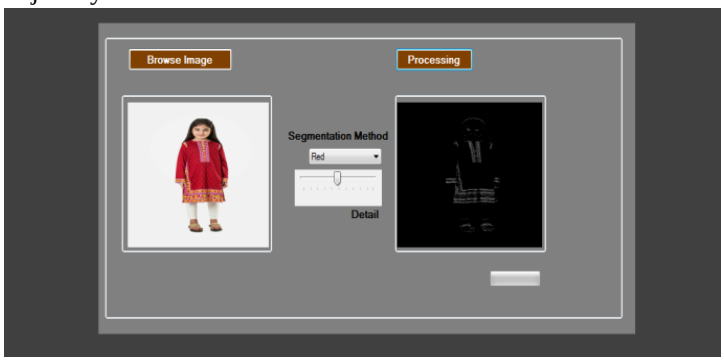

Figure 5. Red

Red filters produce a very strong effect and greatly increase contrast. They're often considered too "harsh" for most types of photography, but can be used to produce striking creative effects.

Figure 6 Blue

Blue filters are rarely used for black and white photography. They darken most colours and reduce contrast across an image.

Figure 7 Green

Green filters are less popular than the others but are useful in some circumstances. A green filter lightens and separates green colour from rest. A green filter is mainly used for green colour objects as it helps separate the green objects from the brightly-coloured ones.

Figure 8 Average

The mean filter is a simple filter that replaces the centre value in the window with the average (mean) of all the pixel values in the window. After edge based segmentation I have done saliency with video and image seen in figures.

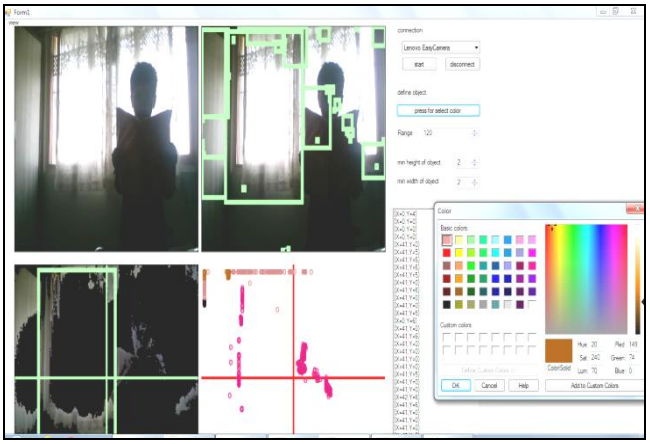

Figure 9 Video saliency

In video saliency color, size , range etc. are to be chosen It applies PCA – SIFT descriptor. PCA-SIFT is a vector of image gradients in x and y direction computed within the support region. . We see the detected salient objects in first quadrant , next to it is the image of video. In third quadrant the object of biggest size of that color is seen followed by the position of objects of that colour and size in fourth quadrant.

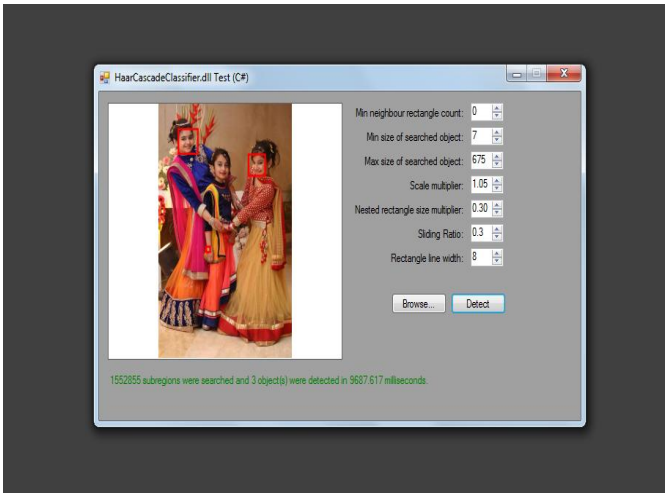

Figure 10 Image saliency

Image saliency detection is the key to the extraction of image information. Extracting image saliency regions is required in most image processing methods that are based on image content because important image components provide the most comprehensive information on an entire image. Therefore, precisely, extracting the salient regions of images effectively facilitates many image applications such as image retrieval, adaptive image compression, object recognition, and content-aware image resizing. In my application after browsing image and applying parameters of desired size, neighbouring rectangle count, scale factor etc. detected objects are highlighted according to the selected parameters.

IV EXPERIMENTAL RESULTS

Computer system users, administrators, and designers are all interested in performance evaluation since their goal is to obtain highest performance at the lowest cost.

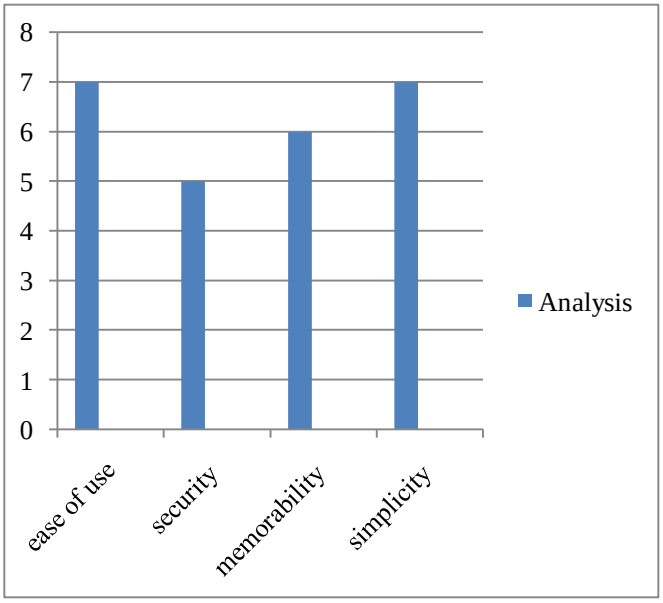

Figure 11 Comparison of current Approach

The chart shows analysis of my approach for security, usability and memo ability and must be improved etc.

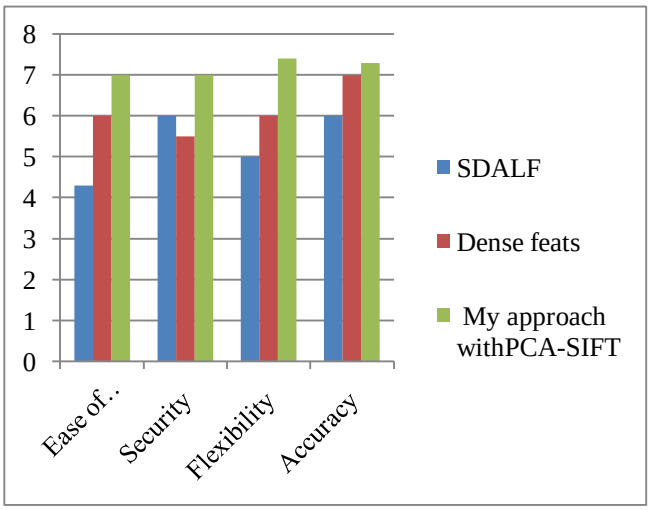

Figure 12 Comparison with some other approaches as Dense feats, SDALF

This goal has resulted in continuing evolution of higher performance and lower cost systems leading to today's proliferation of workstations and personal computers. As the field of computer design matures, the computer industry is becoming more competitive, and it is more important than ever to ensure that the alternative selected provides the best cost-performance trade-off.

Performance evaluation is required at every stage in the life cycle of a computer system, including its design, manufacturing, sales/purchase, use, upgrade, and so on.When compared with some other approaches as Dense feats, SDALF etc. results are encouraging.

V CONCLUSION

Image matching and identification is a fundamental aspect of many problems in computer vision, including object or scene recognition and motion tracking. More specifically, re-identification of an individual or a group of people collectively is the task of visually matching a single person or a group in diverse scenes, obtained from different cameras distributed over non-overlapping scenes (physical locations) of potentially substantial distances and time differences. Person re-identification is a fundamental task in tracking and surveillance and has been an area of intense research in the past few years. Person re-identification is defined as a process of establishing correspondence between images of same person taken from different cameras.

People re-identification' can be defined as the process of matching individuals with a dataset, in which the samples contain different light, pose and background conditions from the query sample. Person re-identification becomes difficult because of the ambiguity and uncertainty in a person's appearance in images and videos. These difficulties are increased by low resolution images or poor quality videos with unrelated or not useful information in them that does not help in re- identification. Salient object detection helps in finding useful regions in images and videos. These regions contain important information and easily attract human attention and thereby help in person identification. The detected regions can be further used for applications of object detecting and recognizing, compressing of image content-based image editing, and image retrieval. One of the main challenges in salient object detection is to uniformly emphasize desired objects and suppress irrelevant background.

Saliency detection is a useful tool for video-based, real-time Computer Vision applications. Salient Object Detection refers to the ability to detect the salient objects in the scene. Salient Object Segmentation is the ability of the saliency map to detect and segment the salient objects present in the scene.

Computationally obtaining salient regions has been investigated for the last few decades and is well appreciated by the computer vision community due to its applicability to tackle complex computer vision problems such as object recognition, video compression, automatic image cropping, scene understanding etc It is helpful in surveillance, tracking ,

activity analysis and saves human effort.

Person re-identification with saliency is an emerging research topic and significant research progress has been achieved in this field in the past five years.

When we integrate person re- identification with saliency we get additional efficiency and reduced efforts as identification is done with the help of salient parts. The proposed system provides an important contribution and novel research direction for practical re-identification. It has edge based segmentation which can be considered as pre-processing followed by video and image object detection via salient parts.

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