amount by which the image is dilated such that maximum points in the object model are matched to image set.

In this automatic VO segmentation algorithm edge change detection starts with edge detection which is the first and most important stage of human visual process. Edge information plays a key role in extracting the physical change of the corresponding surface in a real scene, exploiting simple difference of edges for extracting shape information of moving objects in video sequence suffers from great deal of noise even in stationary background. This is due to the fact that the random noise created in one frame is different from the one created in the successive frame, and thus results in slight changes of the edge locations in the successive frames. Thus difference edge of frames suppresses the noise in luminance difference by means of canny edge detector.

5. Visual Saliency

Visual attention may be a solution to the inability to fully process all locations in parallel. However, this solution produces a problem. If you are only going to process one region or object at a time, how do you select that target of attention? Visual salience helps your brain achieve reasonably efficient selection. Early stages of visual processing give rise to a distinct subjective perceptual quality which makes some stimuli stand out from among other items or locations. Our brain has evolved to rapidly compute salience in an automatic manner and in real-time over the entire visual field. Visual attention is then attracted towards salient visual locations.

The core of visual salience is a bottom-up, stimulus-driven signal that announces “this location is sufficiently different from its surroundings to be worthy of your attention”. This *bottom-up* deployment of attention towards salient locations can be strongly modulated or even sometimes overridden by *top-down*, user-driven factors. Thus, a lone red object in a green field will be salient and will attract attention in a bottom-up manner (see illustration below). In addition, if you are looking through a child’s toy bin for a red plastic dragon, amidst plastic objects of many vivid colors, no one color may be especially salient until your top-down desire to find the red object renders all red objects, whether dragons or not, more salient.

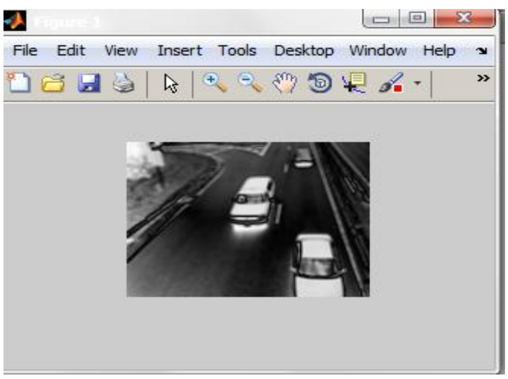

Figure 2: Visual Salient Segment

Visual salience is sometimes carelessly described as a physical property of a visual stimulus. It is important to remember that salience is the consequence of an interaction of a stimulus with other stimuli, as well as with a visual system (biological or artificial). As a straight-forward example, consider that a color-blind person will have a dramatically different experience of visual salience than a person with normal color vision, even when both look at exactly the same physical scene (see, e.g., the first example image below). As a more controversial example, it may be that expertise changes the salience of some stimuli for some observers. Nevertheless, because visual salience arises from fairly low-level and stereotypical computations in the early stages of visual processing the factors contributing to salience are generally quite comparable from one observer to the next, leading to similar experiences across a range of observers and of behavioural conditions.

6. Motion Saliency

The extraction of moving regions from sequential images is carried out by using BM. This kind of BM involves the loss of image information compared with the color BM using RGB and LAB color space models. Depicts the extracted result of moving regions by gray-scale BM, which shows the image information is excessively attenuated. LAB COLOR SPACE :

A *Lab* color space is a color-opponent space with dimension *L* for lightness and ***a*** and ***b*** for the color-opponent dimensions, based on nonlinearly compressed(e.g. CIE XYZ color space) coordinates.

The L*a*b* colour space includes all perceivable colors, which means that its gamut exceeds those of the RGB and CMYK color models (for example, RGB includes about 90% all perceivable colors). One of the most important attributes of the L*a*b*-model is device independence. This means that the colors are defined independent of their nature of creation or the device they are displayed on. The L*a*b* color space is used when graphics for print have to be converted from RGB to CMYK, as the L*a*b* gamut includes both the RGB and CMYK gamut. Also it is used as an interchange format between different devices as for its device independency. The space itself is a three-dimensional Real number space, that contains an infinite possible representations of colors. However, in practice, the space is usually mapped onto a three-dimensional integer space for device-independent digital representation, and for these reasons, the *L**, *a**, and *b** values are usually absolute, with a pre-defined range.

CIE L*a*b* (CIELAB*)* is the most complete color space specified by the International Commission on Illumination. It describes all the colors visible to the human eye and was created to serve as a device-independent model to be used as a reference.

The three coordinates of CIELAB represent the lightness of the color (L* = 0 yields black and L* = 100 indicates diffuse white; specular white may be higher), its position between red/magenta and green (a*, negative values indicate green while positive values indicate magenta) and its position between yellow and blue (b*, negative values indicate blue and positive values indicate yellow). The asterisk (*) after *L*, *a* and *b* are pronounced *star* and are part of the full name, since they represent *L**, *a** and *b**, to distinguish them from Hunter's *L*, *a*, and *b*, described below.

Since the *L*a*b** model is a three-dimensional model, it can be represented properly only in a three dimensional space. Two dimensional depictions include chromaticity diagrams: sections of the color solid with a fixed lightness. It is crucial to realize that the visual representations of the full gamut of colors in this model are never accurate; they are there just to help in understanding the concept.

Because the red-green and yellow-blue opponent channels are computed as differences of lightness transformations of (putative) cone responses, CIELAB is a chromatic value color space.

RGB color model is employed to prevent this excessive attenuation. Also, RGB color model has the shorter execution time because any additional image transformation is not required. But, it is a crucial disadvantage to be very sensitive to even small changes caused by light scattering or reflection. The parameter is proposed to overcome the sensitivity problem

$$\begin{bmatrix} M_i(x,y) \\ N_i(x,y) \end{bmatrix} \triangleq \begin{bmatrix} \min\{V_i^z(x,y)-\delta\} \\ \max\{V_i^z(x,y)+\delta\} \end{bmatrix},$$

$$i=\{r,g,b\},\ 0\le\delta\le 255$$

$$B_i^z(x,y)=\begin{cases} V_i^z(x,y), & \begin{cases} V_i^z(x,y)>M_i(x,y) \\ V_i^z(x,y)<N_i(x,y) \end{cases} \\ 0, & \text{else} \end{cases}$$

The moving regions extracted by are affected by the sensitivity parameter. To obtain the best image, this parameter can be adjusted according to the circumstances where the camera is installed. In our case, the best value is 18/2

The noise caused by light scattering or reflection can be eliminated by the proposed sensitivity parameter. However, the parameter should become larger to eliminate the noise caused by natural objects such as leaves and birds, which leads to extra attenuation on the moving regions. So the morphology, one of the geometric image processing schemes, is used to deal with this kind of noise appearing in the form of the crowd of pixels that the arrows indicate. The erosion operation of morphology removes the noises spread irregularly, and the dilation operation of morphology recovers the loss of moving regions made in the procedure of the erosion

Motion estimation is based on temporal changes in image intensities. The underlying supposition behind motion estimation is that the patterns corresponding to objects and background in a frame of video sequence move within the frame to form corresponding objects on the subsequent frame. Motion estimation is accomplished using ARP's algorithm.

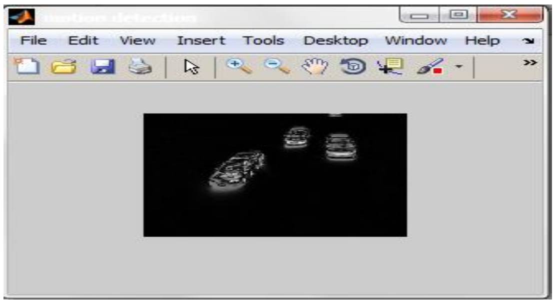

Figure 3: Motion estimated segment

After the determination of motion and visual salient features they are combined .combined images are detected then foreground objects are detected as shown below:

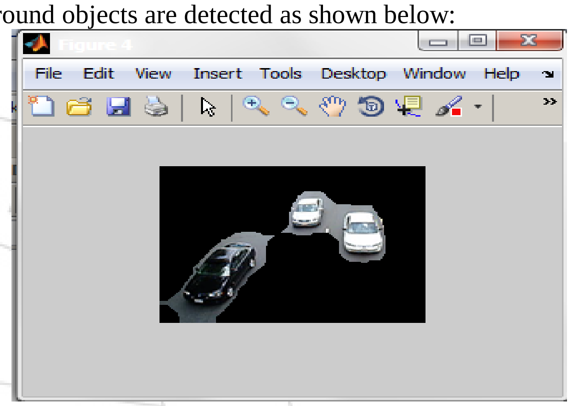

Figure 4: Foreground detected segment

7. Simulation Results

The parameters which determine the performance are PSNR AND MSE.

PSNR:it is the ratio of maximum of power signal to that of corrupted noise.for an image psnr can be calculated from mean square error.

MSE:Difference between estimator and estimated

$$MSE=\frac{1}{m\,n}\sum_{i=0}^{m-1}\sum_{j=0}^{n-1}[I(i,j)-K(i,j)]^2$$

Where I and K represent the image and noise respectively and m,n represents row and column respectively.

$$\begin{aligned} PSNR &= 10\cdot\log_{10}\left(\frac{MAX_I^2}{MSE}\right) \\ &= 20\cdot\log_{10}\left(\frac{MAX_I}{\sqrt{MSE}}\right) \\ &= 20\cdot\log_{10}(MAX_I)-10\cdot\log_{10}(MSE) \end{aligned}$$

Comparing the SGMM and salient method we can conclude that better performance is shown by saliency detection .high PSNR value determines the quality of video detection .The graphical plot has been shown below:

Psnr 1 is representing the proposed method and psnr for the existing .It shows improvement leading to performance increase.

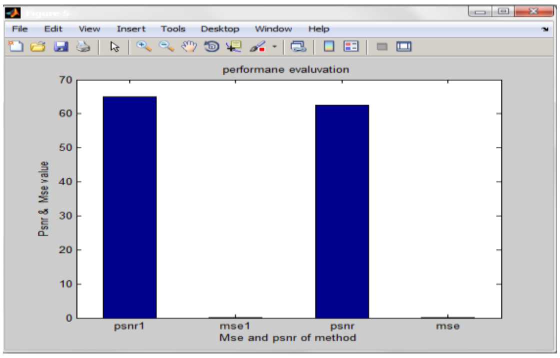

Figure 5: Performance evaluation of SGMM and saliency

8. Conclusion

We proposed a VOE approach which make use of motion and visual saliency induced features, such as shape, foreground/background colour models, and visual saliency, to extract the foreground objects in videos. We advanced a CRF model to integrate the above features, and additional constraints were introduced into our CRF model for preserving both spatial continuity and temporal consistency when performing VOE. Compared with SGMM this was shown better for the extraction of the foreground object due to the fusion of multiple types of saliency-induced features .high PSNR value is also obtained .

9. Acknowledgement

First of all we sincerely thank the almighty who is most beneficent and merciful for giving us knowledge and courage to complete the project work successfully. We also express our gratitude to all the teaching and non-teaching staff of the college especially to our department for their encouragement and help done during our work. Finally, we appreciate the patience and solid support of our parents and enthusiastic friends for their encouragement and moral support for this effort.

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