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RESEARCH ARTICLE

COMPARISON DIVERSE COLOR SPACES MAPS BASED K-MEANS CLUSTERS SEGMENTATION

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ABSTRACT

The Simple K-Means Clustering Technique as an input image articulated in different color spaces with different label fields to be fused. Our paper fusion segmentation maps are combining with clustering procedure as an input features to estimate the local histogram class labels for all initial partitions. This techniques residue simple to realized, quick, a variety range of applications such as motion segmentation and detection and has been lucratively functional on the Berkeley image database. Image segmentation is a traditional inverse problem which consists of achieving a dense region-based sketch of the image scene by decomposing it into having an important effect or spatially coherent regions giving out analogous attributes. In this paper show the prospective of this approach compared to the state-of-the-art segmentation methods recently projected in the literature. Our Proposed work is done by using MATLAB and also results are proficient compared to existing work.

INTRODUCTION

Digital image processing has a broad spectrum of applications such as remote sensing, image storage and transmission for business applications, medical imaging, acoustic imaging, and automated inspection of industrial parts. Images acquired by satellites are useful in tracking of earth resources, geographical mapping, and prediction of agricultural crops, urban growth, weather, flood and fire control. Space imaging applications include recognition and analysis of objects contained in images obtained from deep space-probe missions (Felzenszwalb and Huttenlocher 2004). There are also medical applications such as processing of X-Rays, Ultrasonic scanning, Magnetic Resonance Imaging, Nuclear Magnetic Resonance Imaging, etc. In addition to the above mentioned applications, digital images processing is now being used in solving a wide variety of problems. Successful applications the image processing concepts are found in astronomy, defense, biology and industrial applications (Kato *et al.,* 2003). The images may be used in the detection of tumors or for screening the patients. The current major area of application of digital images processing techniques is in solving the problem of machine vision.

IMAGE SEGMENTATION

Image segmentation is a traditional inverse problem, region based description of image and also the regions having analogous properties. The image segmentation is wide range of applications such as object localization, Object recognition, Data compression, Tracking, Image retrieval and also Image understanding. Image feature has been represented as vectors. The group of vectors into classes (Pérez *et al.*, 2002). A set of connected pixels belonging to each class are also called as regions. This technique are very easy, proficient and most traditionally used. The older method has deceitful the better segmentation Models (Berkhin 2002). The proposed work to the initial segmentation maps then is fused collectively by our fusion construction are purely given, in our application, by a K -means clustering technique, functional on an input image articulated by different color spaces (Figure 1).

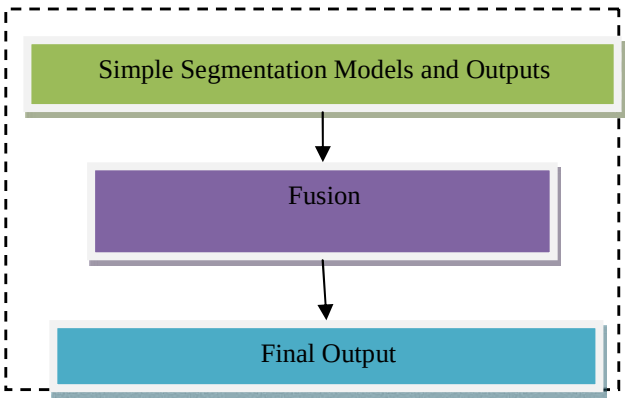

Figure 1. Block Diagram of Proposed Model (Fusion)

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INITIAL SEGMENTATIONS TO BE USED

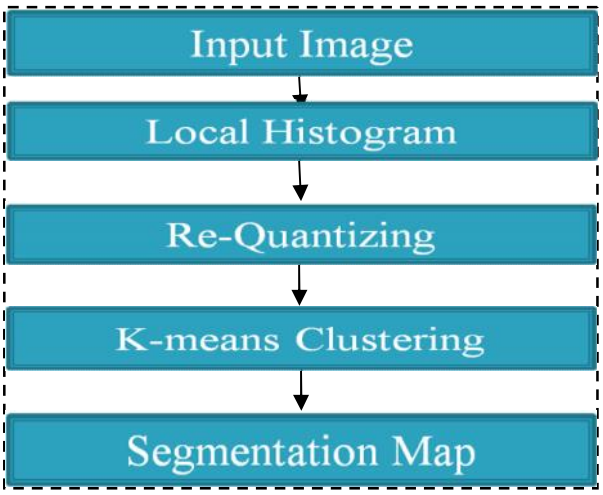

Figure 2. Steps followed in initial Segmentations to be fused

In the Figure 2, The initial segmentation maps which will then be fused together by our fusion framework are basically given, in our application, by a K -means clustering technique, practical on an input image uttered by diverse color spaces, and using as simple cues (i.e., as input multidimensional characteristic descriptor) the set of values of the re-quantized color histogram (with halfway binning) predictable around the pixel to be classified (Mignotte *et al.*, 1999). In our application, this local histogram is regularly re-quantized (for each of the three color channels) in a Vb=5*5*5=125 bins descriptor, computed on an overlapping squared fixed-size NW=7 region centered on the pixel to be classified. This estimation can be hurriedly computed by using a additional improperly requantized color space and then computing the bin directory that represent each re-quantized color is shown in Figure 3.

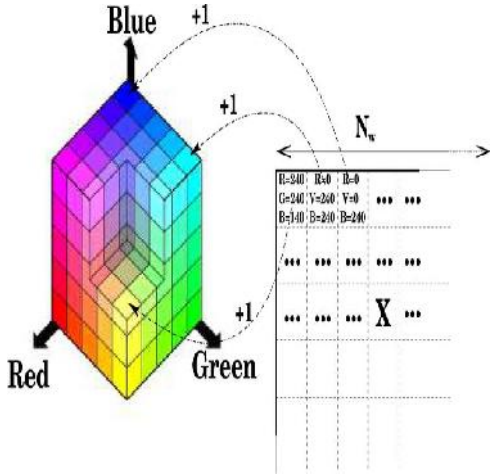

Figure 3. RGB Color Spaces

Advantages

- ❖Simple to Compute
- ❖Significant data induction
- ❖Efficient for Tracking application
- ❖Colors Used as RGB, HSV, YIQ, XYZ, LAB, LUV

Each Color space has an important property. This Property is taken into account while implementing the fusion algorithm

Tracking

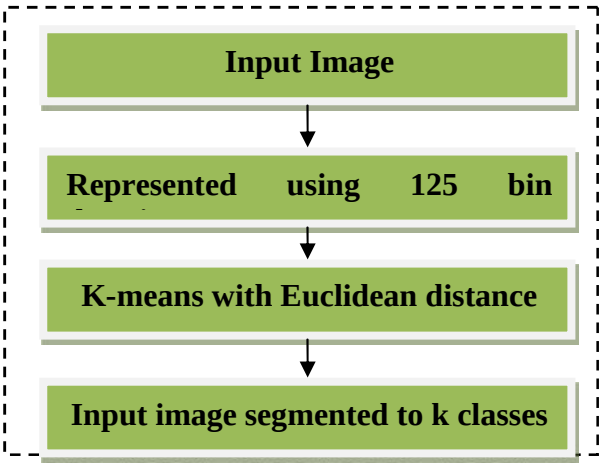

Figure 4. Efficient Tracking Applications

DIFFERENT COLOR SPACES

RGB
- ❖Additive Color system based on Tri-chromatic Theory
- ❖Non linear with visual perception

Optimal one for tracking applications
HSV
- ❖Decouples chromatic information for shading effect

YIQ
- ❖Codes luminance and chrominance information useful in compress application.
- ❖Human Color characteristics is simulated

XYZ
- ❖Psycho visually linear

LAB
- ❖Approximates the human vision
- ❖Perceptually Uniform spacing of color

FUSION SEGMENTATION MAPS

Fusion segmentation maps are based on Bhattacharya distance

$$D_B(h^*, h(x)) = \left(1 - \sum_{n=0}^{N_b-1} (h^*(n)\, h(n: x))^{1/2}\right)^{1/2}$$

- ❖Two sites with local class label histogram is too far (Belong to different classes m final segmentation)
- ❖Two sites with local class label histogram is not too far (Belong to same classes m final segmentation)

The solution thought of the proposed fusion procedure purely consists of considering, for each site (or pixel to be classified), the local histogram of the class (or text on) labels of each segmentation to being fused, compute on a squared fixed-size (Nw) neighborhood centered around the pixel, as input feature vector of a final clustering procedure (6) . For a fusion of Ns segmentation with classes K1 into a segmentation with K2 classes, the prelude feature extraction step of this fusion procedure thus yields to Ns (K1 -bin) histograms which are then gathering together in order K1*Ns to form, a dimensional feature vector or a final (K1*Ns)-bin histogram which is then normalized to sum to one, so that it is also a probability distribution function. The proposed fusion procedure is then here in simply considered as a problem of clustering local

histograms of (preliminary estimated) class labels computed around and associated to each site. To this end, we use, once again, a K-means clustering procedure exploiting, for this fusion step, a histogram-based similarity measure derived from the Bhattacharya similarity coefficient

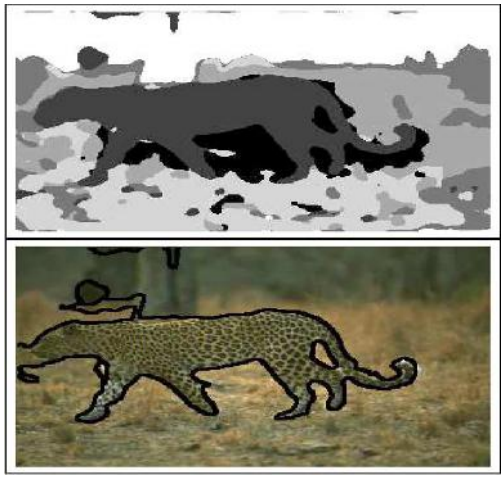

Figure 5. Final Merging Using Bhattacharya Distance

Input Image

Figure 6. Input Image

HSV Segmentation

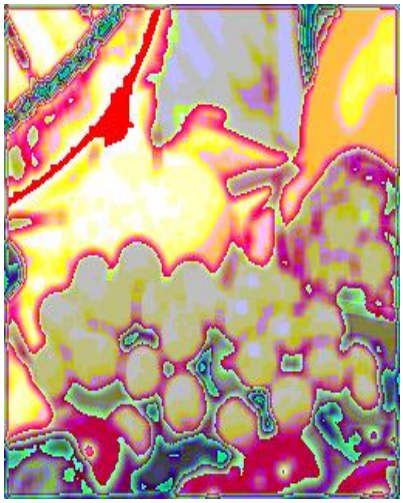

Figure 7. HSV Segmentation

RESULTS AND DISCUSSION

In all the experiments, we have considered our fusion methods on initial segmentations obtained with the following parameters, the size of the squared window, used to compute the local histogram for the initial segmentations or the fusion procedure is set to Nw=7*7 . The number of bins for each local re-quantized histogram is set to Nb=5*5 *5. We use Ns =6 segmentations provided for the following color spaces RGB, HSV, YIQ, XYZ, LAB, and LUV. Several quantitative performance measures will be given for little values of K1 and K2 and respectively, the number of classes of the segmentation to be fused and the resulting number of classes of the final fused segmentation map. The optimal value of seems to be comprised between 0.10 and 0.15.

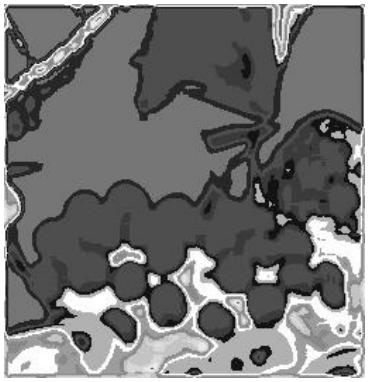

Figure 8. HSV Segmentation

YIQ Segmentation

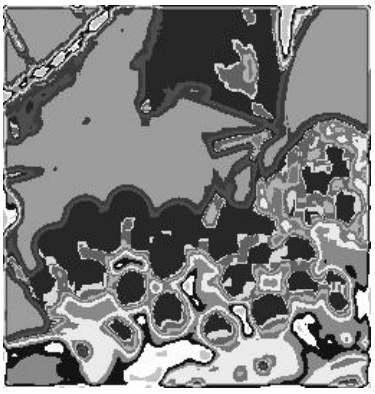

Figure 9. YQ Segmentation

XYZ Segmentation

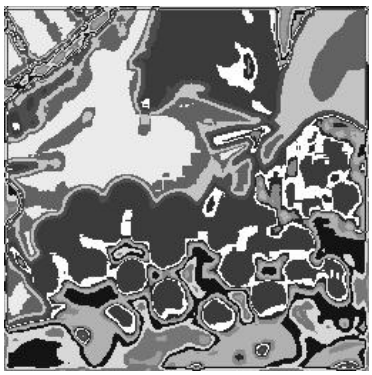

Figure 10. XYZ Segmentation

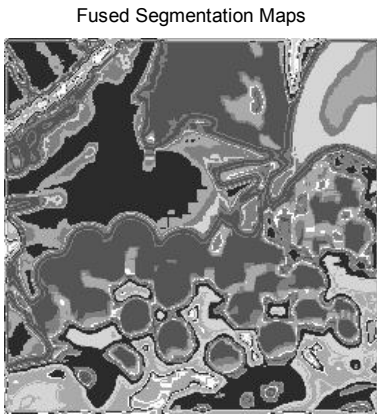

Figure 11. Fusion Segmentation Maps

BHATTACHARYA DISTANCE

Parameters	Existing Method	Proposed Method
PRI	07613	0.6810
VOI	2.440	1.9880
GCE	0.2424	0.1424
BDE	10.167	9.167

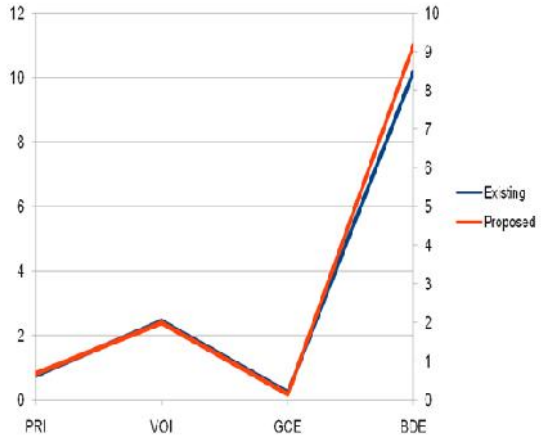

Figure 12. Comparison on Segmentation method using Bhattacharya distance

Conclusion

In this paper a segmentation map based fusion procedure in arranges to finish get a more dependable and accurate segmentation result. The output result of the initial and input image potable by a given filter bank with different segmentation model results provided by different variation of parameters of the stochastic segmentation model. This fusion framework remains easy, quick, simply Parallelizable, general enough to be applied to various computer vision applications. We also compare the results based on Bhattacharya Distance; our results are more efficient and better than older method. Our future is to be implemented using fuzzy logic techniques.

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