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Region-Based Saliency Detection and its Application in Object Recognition

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Abstract- This paper is used to improve saliency detection, in specific super pixels is more perceptually meaningful units are used to represent the input image, which could not detect large salient objects and tolerate the outliers in the messy background during saliency detection. This saliency detection aims at calculating saliency in the region level saliency inspired weighted sparse coding and saliency weighted max pooling by using the achieved saliency map for solving object recognition task. Such weighted sparse coding can learn a more discriminative codebook to favor the feature coding of those more salient/important features. Moreover, to further reduce the effect of noisy background and emphasize the importance of object regions, the saliency weighted max pooling for image representation can be implemented, which further improves the image representation ability.

Keywords: saliency detection, weighted sparse coding, noisy background.

I. INTRODUCTION

For many images that is impossible to detect objects just by using local features. Object recognition describes the task of finding and identifying objects in an image or video sequence. Humans recognize a multitude of objects in images with little effort, despite the fact that the image of the objects may vary somewhat in different view point, in many different sizes and scales or even when they are translated or rotated. Objects can even be recognized when they are partially obstructed from view. This task is still a challenge for computer vision systems. Many approaches to the task have been implemented over multiple decades. Image processing is a method to convert an image into digital form and perform some operations on it, in order to get an enhanced image or to extract some useful information from it. It is a type of signal dispensation in which input is image, like video frame or photograph and output may be image or characteristics associated with that image. Usually Image Processing system includes treating images as two dimensional signals while applying already set signal processing methods to them.

Image processing basically includes the following three steps:

- Importing the image via image acquisition tools.
- Analyzing and manipulating the image.
- Output in which result can be altered image or report that is based on image analysis.

A technique in which the data from an image are digitized and various mathematical operations are applied to the data, generally with a digital computer, in order to create an enhanced image that is more useful or pleasing to a human observer, or to perform some of the interpretation and recognition tasks usually performed by humans and also known as picture processing. In this paper some of the design choices of previous methods and propose a conceptually clear and intuitive algorithm for contrast-based saliency estimation.

II. RELATED WORK

Preprocessing is done with Contrast-Limited Adaptive Histogram Equalization to get enhanced image. Next, cells are separated from background using global threshold. Then, distance transform of binary image is computed which converts binary image into distance map indicating distance of every cell pixel from its nearest background pixel. In order to perform template matching, the template image is generated from the distance transform of circular disk. Landscape generation approach to model the directional spatial relationship between buildings and their shadows[1]. The reconstruction of the shadow area is done by using image in painting technique [2]. XiaominGuo and Feihong Yu introduced a method of automatic cell counting based on microscopic images [3]. Histogram information is used to calculate adjustable lower and upper threshold value but the result shows that maximum relative error is 1.33%. Object counting is important for quantitative analysis that depends on estimation of certain elements. This paper reviews the literature based on object counting problem using image processing [4]. But the objectives to study different methodologies of object counting and identify future research directions. The process of selecting relevant image features is often determined by the modality of medical images and the nature of the diagnoses [5]. To create a graph with two terminals the edge weights reflect the parameters in the regional and the boundary terms of the cost function [6]. Some experimental results are presented in the context of photo/video editing and medical image segmentation. Since the initial segmentation is estimated based only on shadows, the accuracy of method in [10] notably decreases when extracting shadows is not reliable. Müller and Zaum [13] found homogeneous roof candidate regions by seeded region growing. From [10] have adopted the idea of using shadows and directional spatial constraints and proposed to extract the final rooftop using CRF optimization at pixel level.

III. PROPOSED WORK

The perceptually and semantically meaningful salient regions can be identified. The saliency of each super pixel is measured by using its spatial compactness, which is calculated according to the results of Gaussian mixture model (GMM) clustering. To propagate saliency between similar clusters the segmentation is used. Suggest that early features, such as color, contrast, and orientation, indirectly affect human attention through recognizing objects. I propose to adopt super pixel representation for saliency detection. This work aims at calculating saliency in the region level and also the properties of image can be identified in this method. Each pixel size and RGB colors can be displayed in the work for identifying color range of an image. The proposed scheme is studied in four phases namely,

1. Re-constrain method
2. Object Matching
3. Albedo method
4. Region based RGB color

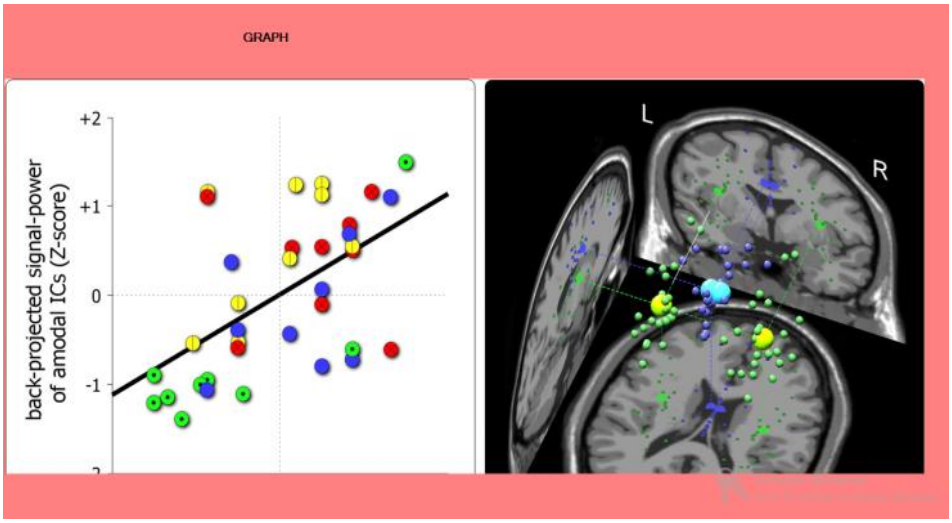
I. Re-constrain method

The objects are usually more salient than the background. Therefore, the features located on the object should play more important roles for the recognition of the object in the images. The saliency of each super pixel is measured by using its spatial

compactness, which is calculated according to the results. This method can extract RGB colors from the image to identify objects in background. This Module only think find Object recognition.

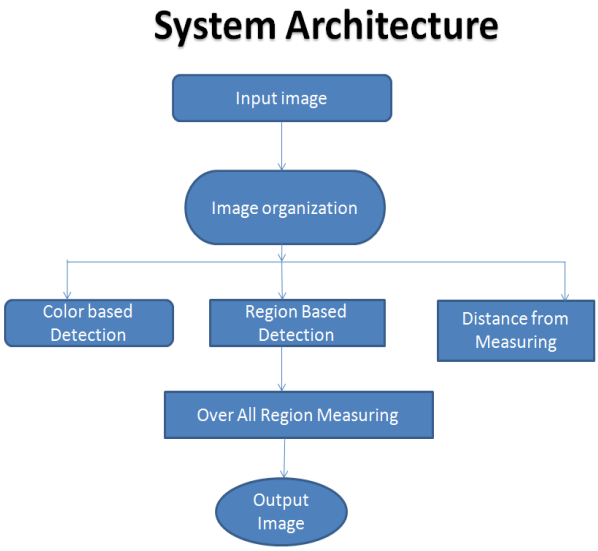
II. Object Matching

For object recognition, the objects are usually more salient than the background. Therefore, the features located on the object should play more important roles for the recognition of object in the images. It's matching each pixel by pixel. First use the adaptive mean shift algorithm to extract super pixels from the input image, then apply Gaussian mixture model (GMM) to cluster super pixels based on their color similarity. The image is segmented and lightings can be applied to an image based on axis. The left and right of image is detected and then the object will match. The graph for segmentation is given,



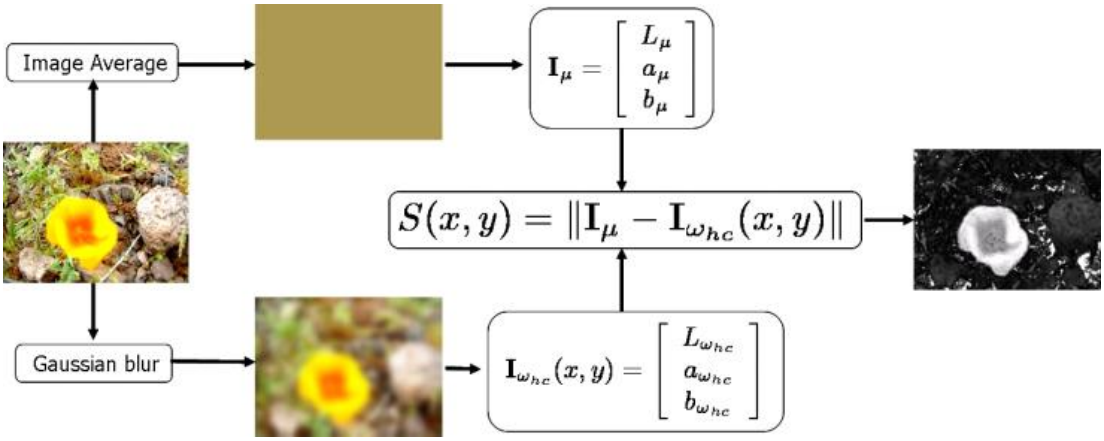
III. Albedo method

More over to improve the object albedo method is used. It contains both color and contrast for identify the objects in background. Most of these methods represent the input images in a pixel-grid manner. This method will help for top level identification of pixels by adding this, multiple process will done. The system architecture is given,



IV. Region based RGB color

The main idea of this approach is to integrate pixel- and segment-level information of an image. Gaussian mixture model (GMM) clustering method is to segment the image into homogeneous regions. Each pixel size and RGB colors present in an image is identified by the axis. The color of each object is identified in the module, height and width can be calculated based on the matrix evaluation. The matrix evaluation for image is given,



IV. EXPERIMENTAL RESULTS

Visual saliency measures to what extent a region attracts human attention. Recently, researchers have shown an increased interest in automatic saliency detection because of its (potential) application in many scenarios. The study of saliency detection will improve the object recognition in region level. The design view of saliency detection is given,

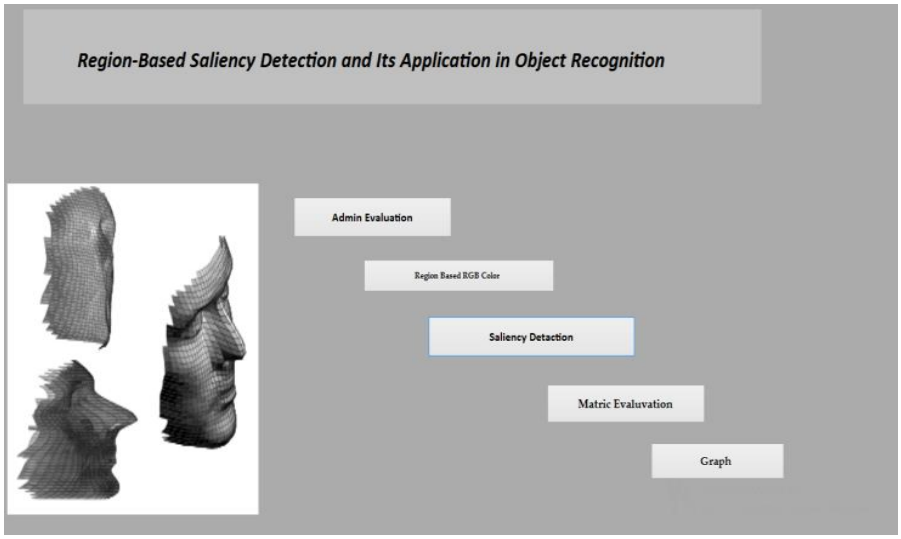


Fig1: Login done

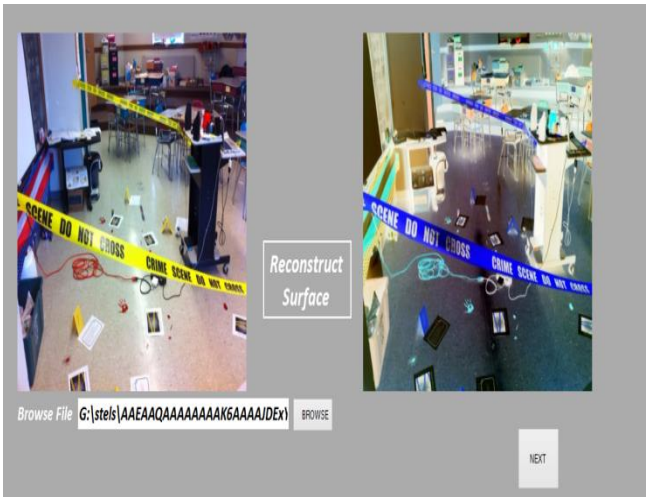


Fig2 : Re-constrain of surface is done

Fig3 : Lightings applied to surface by segmentation

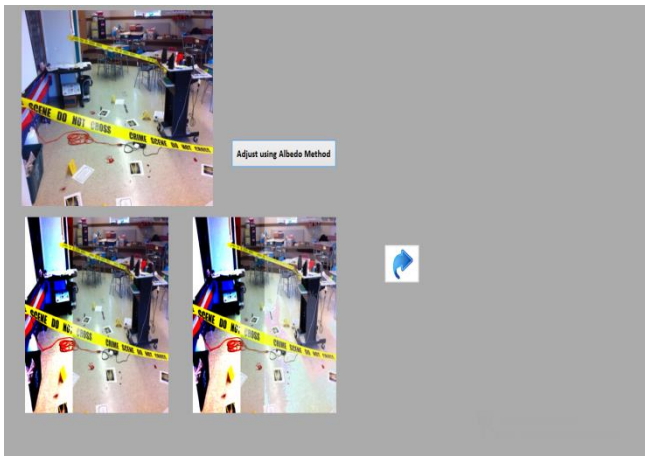


Fig4 : color and contrast can be applied

Fig5 : properties of an image can be identified

V. CONCLUSION

Propose a promising saliency detection approach, which can generate accurate saliency maps with well-defined object boundary. To avoid deficiency of pixel representation in large salient region detection and tolerate noise, our method employs adaptive mean shift algorithm to extract perceptually and semantically meaningful super pixels as features. We also refine the saliency values by a modified Page Rank algorithm for propagating saliency between similar clusters. Experiments show that these two strategies can improve the saliency detection.

VI. FUTURE ENHANCEMENT

Besides features from spatial domain, characteristics from frequency domain are also investigated for saliency detection. Hou and Zhang calculated saliency on frequency domain based on spectral residual. Later, Guo *et al.* pointed out that it is not the amplitude spectrum but the phase spectrum that contributes to saliency detection. They make use of phase spectrum to detect saliency and extend 2-D Fourier transform to a quaternion Fourier transform for spatiotemporal saliency detection.

REFERENCES

[1] A. O. Ok, "Automated detection of buildings from single VHR mul- tispectral images using shadow information and graph cuts," ISPRS J. Photogramm. Remote Sens., vol. 86, pp. 21–40, Dec. 2013.

[2]C.Brenner,"Buildingreconstructionfromimagesandlaserscanning,"Int. J. Appl. Earth Observ. Geoinf., vol. 6, no. 3/4, pp. 187–198, Mar. 2005.

[3] XiaominGuo and Feihong Yu, "A Method of Automatic Cell Counting Based on Microscopic Image," 5thInternationalConferenceon Intelligent Human-Machine Systems and Cybernetics,Vol. 1, Aug.2013. pp. 293-296.

[4] Yan Wenzhong, " A Counting Algorithm for Overlapped chromosomes," The 2ndInternational Conference on Bioinformatics and Biomedical Engineering , June 200 9 pp. 1 – 3

[5] M. Tkalcic and J. F. Tasic, "Colour spaces: Perceptual, historical and applicational background," in *Proc. IEEE EUROCON Comput. Tool Region8*, 2003, vol. 1, pp. 304–308.

[6] Y. BoykovandM.-P. Jolly, "Interactive graph cuts for optimal boundary & region segmentation of objects in ND images," in *Proc. 8th IEEE ICCV*,2001, vol. 1, pp. 105–112.

[7] R. Achanta, S. H. F. Estrada, and S. Susstrunk, "Frequency-tuned salient region detection," in *Proc. IEEE Conf. Comput. Vision Pattern Recognit.*, Jun. 2009, pp. 1597–1604.

[8] B. Alexe, T. Deselaers, and V. Ferrari, "What is an object," in *Proc. IEEE Conf. Comput. Vision Pattern Recognit.*, Jun. 2010, pp. 73–80.

[9] S. Avidan and A. Shamir, "Seam carving for content-aware image resizing," *ACM Trans. Graph., SIGGRAPH*, vol. 26, no. 3, Jul. 2007.

[10] A. Ok, C. Senaras, and B. Yuksel, "Automated detection of arbitrarily shaped buildings in complex environments from monocular VHR optical satellite imagery," IEEE Trans. Geosci. Remote Sens., vol. 51, no. 3, pp. 1701–1717, Mar. 2013.

[11] D. Batra, A. Kowdle, D. Parikh, J. Luo, and T. Chen, "iCoseg: Interactive co-segmentation with intelligent scribble guidance," in *Proc. IEEE Conf. Comput. Vision Pattern Recognit.*, Jun. 2010, pp. 3169–3176.

[12] C. M. Bishop, *Pattern Recognition and Machine Learning*, 1st ed. Berlin, Germany: Springer, 2007.

[13] S. Müller and D. W. Zaum, "Robust building detection in aerial images," in Proc. Int. Arch. Photogramm. Remote Sens., 2005, pp. 143–148.

