Advances in Computational Sciences and Technology
ISSN 0973-6107 Volume 10, Number 6 (2017) pp. 1675-1681
© Research India Publications
http://www.ripublication.com

A Mechanism For Extraction Of Standing Human Body From Photo Using Multilevel Segmentation

[1]Munde Sainath S. [2]Dr.H.S. Fadewar [3]Shivpuje Prakash R.
[4]Munde Saraswati and [5]Munde Maroti

[1-5]Department of Computer Science, School of Computer Science, SRTMU NED, Vishnupuri, Nanded-431 606, (Maharashtra), India.

Abstract

Now a day's Digital image processing use has been increased but still there are some problem like automatic multilevel segmentation and extraction of standing human body from a photograph is still challenging work. In this paper the approach to extract and multilevel segmentation of standing human body from image is proposed. In this work we perform face detection then skin detection two color base classifications used to get optimized result after that upper body segmentation and lower body segmentation then followed by upper body extraction and lower body extraction then both extractions to get result.

Keywords: Multi level segmentation, skin detection, face detection, upper body segmentation, lower body segmentation, human bodies, super pixels, bottom-up approach.

1. INTRODUCTION:

Extraction of the human body in restricted still images is challenging due to several factors, Including shading, image noise, occlusions, background clutter, the high degree of human body deformability, And the unobstructed positions due to in and out of the image plane rotations.[2] Still in the market there is much need automatically extract standing human body from photograph and indentify various human pose weather it is sitting or standing or is it bended etc. [6]Now a days there are many photo application available to processing on images but still it is very challenging work to extract various human shapes and also hard to identify a original image and its background difference. After that researchers decided to divided a human body into different part and then extract. Another move toward is to make use of some existing cues to guide image segmentation to taking out object. [1]Rother et al. proposed an interactive foreground/background segmentation called GrabCut. It is an iterative image segmentation technique based upon the Graph Cut algorithm. Since the cues for photo segmentation are given manually, it is mostly used as an interactive photo tool for foreground object taking out.[3] motivated by the work of Rother et al., we here come up to to automatically extract human body region from color image, which incorporates enthusiastically updating trimap human body with iterated GrabCut method. On allowing for the variety and diversity of human poses, we constrict our researches on those human poses with frontal/side faces in color photo images and focus on the topic of human body region extraction, which aims to separate human body from background and does not classify human body parts.[10]Different from the trimap guiding the image segmentation in our approach is initialized from the results of detected faces, and the contour of the trimap is updated dynamically during body extraction. This is motivated by a fact that estimation on a small region is more accurate than on a large region if a few cues are just available.[4]And we noticed that human torso is relatively stable in appearance compared with various human poses formed by hands and feet. A body torso is firstly extracted. Then the trimap is updated by dynamically growing its contour according to local image information, and new body region is estimated by applying GrabCut to the target image.[5]With the iterated processing of trimap shape updating and GrabCut applying, human body region is finally extracted. We classified theproblem into three problems: there is a direct correlation among them, Face detection, upper body extraction, and lower body extraction.

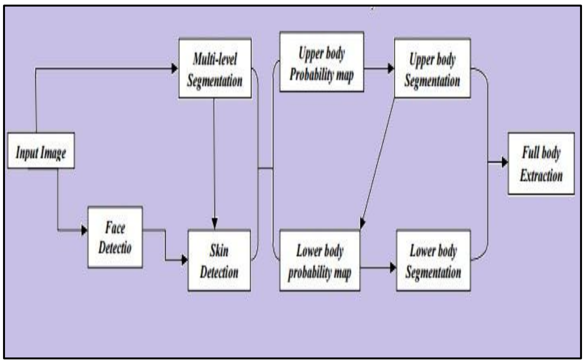

Figure 1: The proposed method methodology in different steps

2. LITERATURE SURVEY

Owens et al (2002) developed an algorithm to segment the objects in video surveillance applications. The objects were extracted using background differencing method. The hierarchical network was used to classify the object motion whereas the self organizing map was used to describe the local motion of the vectors. The noise was removed using ‘opening’ morphological operator in the difference image.

Most existing methods were used in skin color segmentation approach for detecting the faces in still images. Vladimir Vezhnevets et al (2003) have shown a survey of the pixel based skin color detection techniques with their decision rules and its corresponding threshold values. Son Lam et al (2003) suggested the Bayesian skin color model to find the skin regions. The detected regions were processed using the property of homogeneity of the human skin.

The skin color segmentation process has also been applied for detecting the human body parts. Xiaojin Zhu et al (2000) proposed a method to detect the upper body parts through the skin color information. The RGB color model was used to find the skin features. The face of the human has found using the skin color information initially and then it was applied to other upper body parts such as chest and arms. This algorithm was unable to find the arms if it was attached with the chest

Feifei Huo et al (2009) presented an approach to capture marker less human motion and recognize the human poses. The system was used to detect the torso and hands of the human body. The hands were tracked and identified by the skin color features. The RGB color space was utilized for separating skin pixels from non-pixels on the foreground image. Here, the skin color information of the hands was not differentiated from the color features of face.

Fei Xie et al (2009) adopted a method to recognize the human body poses for visual surveillance applications. This work was concentrated on developing the 2D model of human using improved thinning algorithm. The human activities such as standing of body, stopping of body and running were implemented. The efficiency was compared with other thinning algorithms such as Zhang’s thinning algorithm and Rosenfeld’s thinning algorithm.

3. PROPOSED METHOD

(a) Face Detection

Finding location of the face region in our method is performed by using Open CV’s implementation of the Viola–Jones algorithm [10]& [8]) for achieving high-performance and speed. The algorithm utilizes the Ad boost method combinations with Haar-like features, which mainly aim in capturing the underlying structure of a human face, regardless of skin color . The other methods like SMQT Features and SNOW Classifier Method, Local Binary Pattern (LBP) and Neural Network-Based Face Detection can also helpful to detect face of human in an image but they have some drawbacks. In SMQT Features and SNOW Classifier Method, pixel information of an image is required to detect face, the regions that contain almost similar to gray values regions that are present in the image which might detect them as face. The Local Binary Pattern (LBP) method does not give accurate results. The Neural Network-Based Face Detection is a complex method and does not give accurate results. So Viola–Jones algorithm is used in this method to achieve speed and performance.

(b) Multi level image segmentation

Depending exclusively on free pixels for confounded inference prompts to propagation of blunders to large amount of image processing in complex situations.[5]There are a few distinctive sources of noise, such as compression, the digital sensors that captured the image or even the unpredictability of the image itself and their impact is more extreme at pixel level.[3] A typical practice to ease the noise abiding at the pixel level is the utilization of filters and algorithms that extract aggregate data from pixels. Additionally, gatherings of pixels express higher semantics. Little gatherings safeguard and vast groups tend to catch shape and more theoretical structures better. At long last, the computations in view of super pixels are more proficient and encourage more adaptable algorithms.[8] In this proposed scheme, propose utilizing a image segmentation technique, with a specific end goal to process pixels in more important groups. Be that as it may, there are various image segmentation algorithms, what's more, the determination of a proper one depend on the accompanying criteria. To begin with, we require the algorithm to have the capacity to save solid edges in the image, since they are decent sign of boundaries between semantically extraordinary regions. Second, another alluring characteristic is the creation of segments with generally uniform sizes. More vitally, proposed a utilizing various levels of segmentation, keeping in mind end goal to lighten the requirement for selecting proper number for regions to be made and consolidate information exuding from various perceptual groupings of pixels.[9] Despite the fact that proposed system can acknowledge any of segmentation levels, proposed system find that two segmentation levels of 100 and 200 segments give precise results.

(c) Skin detection algorithm

Skin tone varies because of illumination and ethnicity, the fact that limbs often do not contain enough contextual information to discriminate, and skin like regions are the most prominent obstacles to detecting skin regions in images.[8] In this paper, proposed a combining an appearance model created for each face with global detection. It provides strong distinction between skin and skin like pixels. These segmentation cues are used to create regions of ambiguous. Regions of certainty and ambiguous consist a map that follows the GrabCut algorithm, which provides outputs for final skin regions.[8] Using anthropometric constraints and body connectivity are eliminating false positives. False positives are eliminated using anthropometric constraints and body connectivity. Each image pixel's probability of being a skin pixel is calculated separately for each channel according to a normal probability distribution with the corresponding parameters. We expect true skin pixels to have strong probability response in all of the selected channels. The skin probability for each pixel X is as follows:

$$P_{Skin_i}(X) = \prod_{j=1}^{6} \mathcal{N}(X, \mu_{ij}, \sigma_{ij}) \qquad (1)$$

4. RESULTS:

The proposed approach was implemented and evaluated with 400 real-life digital photo images of indoors and outdoors. Nearly 75% human bodies in the photos are extracted. Proposed scheme implementation based on MATLAB2013a and processing keeps going by and large 3 min for each image with size of 640 x 480 pixels over a machine configuration Intel(R) Pentium(R) CPU B980 @ 2.40GHz, 2GB RAM, 64bit, windows8. the following fig shows some extracted examples. The test results show that the proposed approach is useful.

Fig 2. Some test experiment results on human body region extraction from photo images

5. CONCLUSION

A mechanism for multilevel segmentation and extraction of standing human body from photo has proposed in this paper. Extraction of standing human body from photograph is successfully perform. Firstly we combines information about multilevel segmentation in order to discover salient regions with high prospective of belonging to the human body. The fundamental segment of the framework is the face recognition step, where assess the rough location of the body, develop a rough anthropometric model. Delicate anthropometric requirements direct a productive for the most visible body parts, to be specific the upper and lower body, maintaining a strategic distance from the requirement for solid earlier learning, for example pose of the body. Soft anthropometric

Constraints guide an efficient search for the most visible body parts, namely the upper and lower body, avoiding the need for strong prior knowledge, such as the pose of the body. Future work will focus on how to initialize the body trimap more flexibly, and establishing a model to estimate that is really a true part of human body or not so that intelligent body trimap updating is possible.

REFERENCES

[1] V. Ferrari, M. Marin-Jimenez, and A. Zisserman, “Progressive search space reduction for human pose estimation,” inProc. IEEE Conf. Comp. Vis. Pattern Recog., 2008,

[2] M. P. Kumar, A. Zisserman, and P. H. Torr, “Efficient discriminative learning of parts-based models,” in Proc. IEEE 12th Int. Conf. Comp. Vis., 2009, pp. 552–559.

[3] M. Andriluka, S. Roth, and B. Schiele, “Pictorial structures revisited: People detection and articulated pose estimation,” inProc. IEEE Conf. Comp. Vis. Pattern Recog., 2009, pp. 1014–1021.

[4] M. Everingham, L. Van Gool, C. K. Williams, J. Winn, and A. Zisserman, “The pascal visual object classes (VOC) challenge,”Int. J. Comput. Vis., vol. 88, no. 2, pp. 303–338, 2010

[5] Greg Mori, Xiaofeng Ren, Alexei A. Efros and Jitendra Malik, “Recovering human body configurations: combining segmentation and recognition,” in Proc. IEEE Comp. Soc. Conf. Comp. Vision and Pattern Recogn., vol. 2, pp. 326-333, 2004.

[6] A. Gupta, A. Kembhavi, and L. S. Davis, “Observing human-object interactions: Using spatial and functional compatibility for recognition,”IEEE Trans. Pattern Anal. Mach. Intell., vol. 31, no. 10, pp. 1775–1789, Oct. 2009.

[7] B. Yao and L. Fei-Fei, “Grouplet: A structured image representation for recognizing human and object interactions,” inProc. IEEE Conf. Comput. Vis. Pattern Recog., 2010, pp. 9–16.

[8] Ole Helvig Jensen., “Implementing the Viola-Jones Face Detection Algorithm”.Kongens Lyngby 2008, IMMM.Sc.-2008-93.

[9] Dohyoung Lee, Jeaff Wang, and Konstantinos N. Plataniotis“Contribution of Skin Color Cue in Face Detection Applications”

[10] Neetu Saini, Hari Singh., “Comparison of two different approaches for multiple face detection in color images”.International journal of innovative research in electrical, electronics, instrumentation and control engineering vol. 3,Issue 1, January 2015.