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Segmentation of Human Body Image

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ABSTRACT

Human body image segmentation is a difficult process that can use in important application,like scene understanding and activity recognition. In order to deal with the highly dimensional pose space, scene complexity, and various human appearances, the majority of have being works require computationally composite training and template matching processes. We have to converse a bottom-up methodology for segmentation of human bodies from single images, in the case of almost upright poses in cluttered environments. The position, dimensions, and colour of the face are used for the localization of the human body, construction of the models for the upper and lower body according to anthropomertric constraints, and approximation of the skin colour. Different levels of segmentation granularity are combined to extract the pose with highest ability. The segments that belong to the human body arise through the joint approximation of the upper and lower during the body part search phases, which make easy the need for exact shape matching.

Keywords : Adaptive Skin Detection, Anthropometric Constraints, Human Body Segmentation, And Multilevel Image Segmentation

I. INTRODUCTION

Knowledge about the human body parts can benefit various tasks, such as determination of the human layout, recognition of actions from static images, and sign language recognition. Human body segmentation and silhouette extraction have been a common practice when videos are available in controlled environments, where background information is available, and motion can aid the segmentation through background subtraction. In static images, however, there are no such cues, and the problem of silhouette extraction is much more challenging, especially when we are considering complex cases. In this study, We decompose the problem into three sequential problems: Face detection, upper body segmentation, and lower body segmentation, since there is a direct pair wise correlation among them. Face detection provides a strong indication about the presence of humans in an image, greatly reduces the search space for the upper body, and provides information about skin colour. This information guides the search for the upper body, which in turns leads the search for the lower body. Moreover, upper body extraction provides additional information about the position of the hands, the detection of which is very important for several applications.

II. WORKING METHODOLOGY

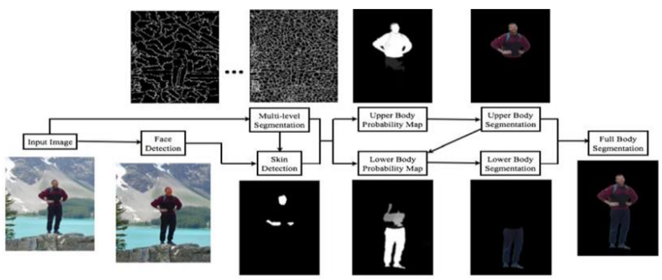

Figure 1. Overview of the methodology.

Figure1 shows overall working method However, we make some assumptions about the human pose, which restrict it from being applicable to unusual poses and when occlusions are strong. In the future, we intend to deal with more complex poses, without necessarily relying on strong pose prior. Problems like missing extreme regions, such as hair, shoes, and gloves can be solved by incorporation of more masks in the search for these parts, but caution should be taken in keeping the computational complexity from rising excessively.

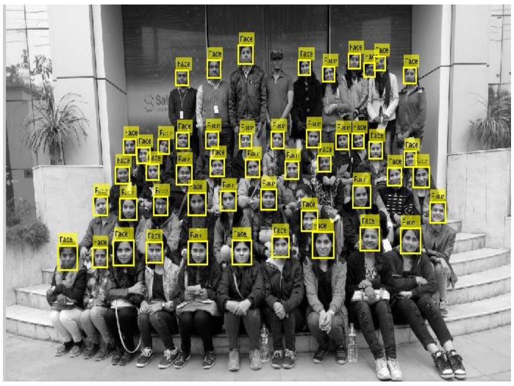

Figure2. Face Detection

Face detection guides estimation of anthropometric constraints and appearance of skin, while image segmentation provides the image's structural blocks. The regions with the best probability of belonging to the upper body are selected and the ones that belong to the lower body follow.

III. RELATED WORK (LITERATURE REVIEW)

"Recovering Human Body Configurations: Combining Segmentation and Recognition" Greg Mori, Xiaofeng Ren, Alexei A. Efros† and Jitendra Malik.

"Estimating Human Shape and Pose from a Single Image" Peng Guan Alexander Weiss Alexandru O. B'alan Michael J. Black Department of Computer Science, Brown University, Providence, RI 02912, USA.

"A Methodology for Extracting Standing Human Bodies From Single Images" Athanasios Tsitsoulis, *Member, IEEE*, and Nikolaos G. Bourbakis, *Fellow, IEEE*

IV. OBJECTIVE

We give the methodology for segmentation of human bodies from single images. It is a bottom-up combining process that combines information from multiple levels of segmentation in order to discover salient regions with high potential of belonging to the human body. The main component of the system is the face detection step, where we estimate the rough location of the body, construct a rough anthropometric model, and model the skin's color. 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. Experiments on a challenging dataset showed that the algorithm can outperform state-of-the-art segmentation algorithms, and cope with various types of standing everyday poses.

Figure 3. Various poses of human body

V. RESULT

Thus we have get and evaluate our algorithm, we used samples from the publicly available INRIA person dataset This is a challenging dataset, since the photos are taken under various illumination conditions, inheavily cluttered environments and people appear in various types of clothing. We estimated the performance of our algorithm in segmenting not occluded persons in images and compared the resultswith those of five generic algorithms (not designed specifically for human body segmentation): Proposals [11], GrabCut [12], the original version of GraphCut [14], geodesic star convexity (GSC) [13], and random walker (RW) [11].

VI. DISCUSSION

There remain prevailing complexities of the main steps. One of the important complexities is the complexity of the image segmentation algorithm. Here, we use the proposed Lgorithmic in [17], which has an avera average requires 2.5 s for image size 481 × 321. Global and adaptive skin detection can be performed in almost real time, so this step is performed quickly, excluding the super pixel creation.Face detection is also fast, since the main step [13] runs in real time and significantly restricts the search space for [16]. The graph matching process described in [15] is generally computationally expensive, but considering that it is only performed on the produced regions of [13], it can be calculated quickly. The most computationally demanding steps are those of mask validation during the upper and lower body extraction processes.ge complexity of $O(n \log n)$ and on average requires 2.5 s for image size 481 × 321. Global and adaptive skin detection can be performed in almost real time, so this step is performed quickly, excluding the superpixel creation. Face detection is also fast, since the main step [12] runs in real time and significantly restricts the search space for [15]. The graph matching process described in [16] is generally computationally expensive, but considering that it is only performed on the produced regions of [13], it can be calculated quickly. The most computationally demanding steps are those of mask validation during the upper and lower body extraction processes.

VII. CONCLUSION

In this study we cover all the algorithms. For segmentation we use SOBEL and KNN and form image from background. For face detect, face detection algorithm. And for upper and lower body segmentation K-MEANS algorithm. we segment whole body by this algorithms. We presented a novel methodology for extracting human bodies from single images. It is a bottom-up approach that combines information from multiple levels of segmentation in order to discover salient regions with high potential of belonging to the human body. The main component of the system is the face detection step, where we estimate the rough location of the body, construct a rough anthropometric model, and model the skin's color. 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. In the future, we intend to deal with more complex poses, without necessarily relying on strong pose prior. Problems like missing extreme regions, such as hair, shoes, and gloves can be solved by incorporation of more masks in the search for these parts, but caution should be taken in keeping the computational complexity from rising excessively. And research to detect twins, also increases more reliability for security application.

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