A Survey on Methodology for Extracting Standing Human Bodies from Images

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-- **Abstract—** Segmentation of human bodies in images is challenging task that can provide various applications, like scene understanding and activity recognition. It also provides the facility for the location of an event that attracts attention. In order to cope with the highly dimensional pose space, scene complexity, and various human appearances, shading, image noise, the majority of existing works require computationally complex training and template matching processes. We propose a bottom-up methodology for automatic extraction of human bodies from images, in the case of almost upright poses in cluttered environments. Extraction of standing human bodies from images can be easily found out by the position, dimension, skin, and color of the face. The position, dimension face color are used for the localization of the human body. A novel Approach for extraction of standing human bodies has proposed in this paper where the highly dimensional pose space, scene density, and various human appearances are handled in better way compared to conventional state of art methods.

Keywords— Skin detection, human body segmentation, multilevel image segmentation, super pixels.

1. INTRODUCTION

Extraction of the human body is difficult problem because of the various factors such as human action understanding, human positions such as standing, drinking, sitting, resting, etc, content-based image retrieval and, complicated background issues, clutter environment, shapes ,image noise ,occlusions, high degree of human body shapes, pose changes and limited position because of inconvenient in and out image rotation. The human body Knowledge is required to assess in many tasks, for example recognition of the human layout, measuring the actions from images and determination of sign languages. According to the investigation, it is proved that human body can be considering as an assembly of parts. And its components are low level part and high level part. Candidate parts are produced from low-level part detectors or come from image segmentation results. Then a top-down procedure makes inferences about these parts and finds the best assembly. Cues are used to guide image segmentation to extract object. In image processing foreground/background is proposed by Rother et al. and with the help of foreground background segmentation has been done which is called as Grab Cut. The cues for image segmentation are given manually hence it's very difficult, so Grab cut concept is used as an interactive image tool for foreground and background to extract object. Inspired by the work of Rother et al., users or we can automatically extract region from human body such as from color photos, human poses, we constrain 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. The general flow of the methodology can be seen in Fig. 1. The major contributions of this study address upright and not occluded

poses.(a) We propose a novel framework for automatic segmentation of human bodies in single images. (b)We combine information gathered from different levels of image segmentation, which allows efficient and robust computations upon groups of pixels that are perceptually correlated. (c) Soft anthropometric constraints permeate the whole process and uncover body regions. (d) Without making any assumptions about the foreground and background, except for the assumptions that sleeves are of similar color to the torso region, and the lower part of the pants is similar to the upper part of the pants, we structure our searching and extraction algorithm based on the premise that colors in body regions appear strongly [1].

2. RELATED WORK

Human body Can be easily extracted from the images using region based method first we have to find the face from the image Then we initialize a body trimap according to the found face. By applying Grab Cut image segmentation technique, we firstly extract the torso part of a human. After that we dynamically grow the trimap to cover the parts of hands and legs. With the iterated processing of trimap shape updating and Grab Cut applying, human body region is finally extracted [2]. Lee and Cohen (2004) demonstrated a method to find the body parts using three steps such as face detection, head-shoulder matching and skin blob detection. The arms positions were tracked using skin color features. It was used to detect the various body joints like head, neck, shoulders, elbows and wrists from the upper body. Xiaoping 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. The next step is to develop the pose models for the pre-defined human postures. After the human body parts are detected, the human pose models are constructed using the feature points in two dimensional (2D) and three dimensional (3D) views. The feature point is a point on the human body which is used to represent the body segments. In this step, totally thirteen feature points are considered to model the upper body as well as the lower body. The feature points include Head, Neck, Left shoulder, Right shoulder, Left hand elbow, Right hand elbow, Abdomen, Left hand, Right hand, Left knee, Right knee, Left leg and Right leg The two types of methods such as skin color and silhouette based are proposed here for human pose modeling[4].

3. PROPOSED METHODOLOGY

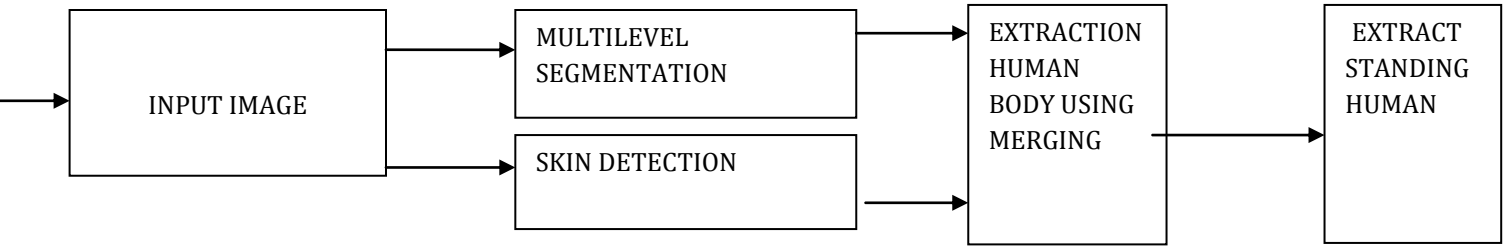

Figure 1: The proposed methodology in different steps.

3.1 Skin detection algorithm.

Skin detection technique is important due to finding skin colored, skin region, gesture recognition, hand tracking, video indexing, face detection , camera characteristics, person tracking in an images and videos. Basically, skin detection can be considered as classification of skin pixels and non-skin pixels. Color spaces used for skin modeling [RGB, HSV, HSI, HSL, and TSL]. Read RGB images. using skin detection Find the image pixels by using two methods: Pixel based skin detection:- Pixel-based skin detection uses the pixel color information for detecting skin pixels. Regional-based skin detection: - Regional-based methods use the relationship between pixels to detect the human skin. The appearance model provides strong discrimination between skin and skin-like pixels, and segmentation cues are used to create regions of uncertainty.

Skin detection steps:

I. Read RGB images
II. Find pixel in skin locus region
III. If pixel is locus at %> threshold then
Select pixel mark as white
Else Mark as black
IV. Remove disconnected single pixels.
V. Result binary map of skin region and non skin region.
VI. Stop

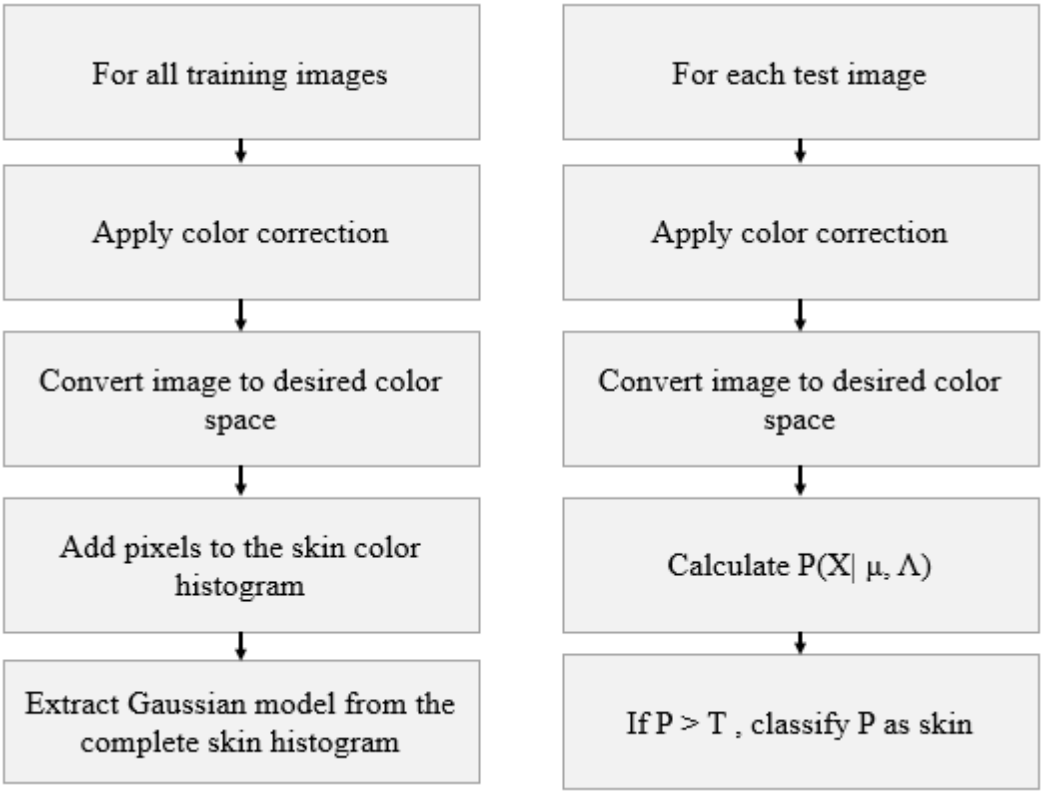

Figure 2: Skin detection steps

3.2 Multi level image segmentation.

Segmentation is the process of dividing a images into different segment is called segmentation .and multilevel segmentations is very important which divided in to multiple segments that is sets of pixels and also know as super pixels. The main goal of segmentation is used to easily identify and simplify the representation of image and also easily analyze it. in this paper we can do multilevel segmentation by using watershed algorithm .watershed transformation is a technique for segmenting digital images that uses a type of region growing method based on an image gradient.. The concept of Watershed Transform is based on visualizing an image we consider three types of points: such as (a) Points belonging to a regional minimum. (b) Points at which a drop of water, if placed at the location of any of those points, would fall with certainty to a single minimum. (c) Points at which water would be equally likely to fall to more than one such minimum [5]. The proposed algorithms can efficiently improve segmentation accuracy and significantly reduce the computational cost of watershed-based image segmentation methods.

3.3 Extraction human body using merging.

Human body can be easily extract in images using the combination of ROI 1 and ROI 2 of skin detection and multilevel segmentation. And then easily performed segmentation.

4. CONCLUSION

A methodology for Extraction of human body from images is proposed in the case of cluttered environment, background issues, human action understanding, human positions such as standing, drinking, sitting, resting etc. in our proposed system we can also combine information collected from different levels of image segmentation in order to discover salient regions with high potential of belonging to the human body. The main component to extract the human body from images is skin detection. Where we judge the rough location of the body, construct a rough anthropometric model, and the skins color. Our proposed system more flexible because of skin detection method instead of face detection. And in the suggested method the algorithm can extract any features of human body in the image using skin. And this method can be applied for different colorful images that include human body. In the future, we intend to deal with more complex poses, without necessarily relying on strong pose prior.

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BIOGRAPHIES

ZUBAIDA KHAN received her bachelor of engineering in Computer Engineering from *Bharati Vidyapeeth College of Engineering, Kharghar* Mumbai University, 2013. She is presently a master student at the Mumbai University, Maharashtra. Her research interests include human detection from images using skin detection algorithm and image segmentation method using image processing.