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A Methodology for Extracting Standing Human Bodies from Images

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ABSTRACT: Detection and extraction of human bodies in an image are a challenging task that can facilitate applications, like activity recognition and detection of the human pose. Extraction of human bodies from images from respective digital image has accomplished consideration in recent times and extensive variety of research is carried on to meet the sought result. This project focuses on extracting human bodies from an image into various parts. The extracted parts are classified into human body organs such as legs, arm, torso, and head. It also provides the facility for the location of an event that attract attention. In this paper proposed a novel strategy to extract human bodies from images where the scene density, the highly dimensional, and various human appearances, shading, image noise,are handled in better way compared to conventional state of art methods.The result can be further applied to many useful applications. One useful application is parts recognition. Once the parts are recognized, they can be analyzed for gesture types for instance, the position of body parts can be interpreted to sitting, standing, or lying. The proposed approach is classified into different steps, (a) multi level segmentation, (b) skin detection, (d) human body segmentation and respectively. Finally the simulation results have achieved better performance and high efficiency over traditional state of art methods.

KEYWORDS: Skin detection, human body segmentation, multilevel image segmentation, bottom-up approach Super pixels.

I. INTRODUCTION

Extraction of the human body in cluttered environment is so difficult problem due to various shading, occlusions, image noise, background clutter, and the unrestricted positions due to in and out of the image plane rotations content-based image retrieval and, complicated background issues, , high degree of human body shapes, pose changes and limited position because of inconvenient in and out image rotation . The knowledge about the human body region can support the various way, such as recognition of actions from still images ([1][2]), determination of the layout of human ([3]-[4]), and sign language recognition ([5]). The silhouette extraction is a challenging task, especially when we are considering intricate cases. 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 Moreover, methodologies that are able to work at a frame level can also work for sequences of frames, and facilitate existing methods for action recognition based on silhouette features and body skeletonization.

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. our main aims to separate human body from background and does not classify human body parts.

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II.RELATED WORK

Human body segmentation approaches are classified into four categories, 1)Interactive methods,2) top-down approaches,3) bottom-up approaches, and 4)Hybrid approach.

1) Interactive methods: Interactive methods are useful for generic application and produced very accurate result in complex cases. it expects user input in order to differentiate the background and foreground. but this method are not But these are not employing object specific knowledge, they often require user to guide their process and are not suitable for many real world problems.

2) Top-down approaches:-Top down approach is always depends on the prior knowledge (anterior knowledge), and also used for fragmentation and segmentation body issues from images. The main characteristics of top down approach is that they require high knowledge about the foreground. Which in the case of human is their pose, human body segmentation approach based on pictorial structure (PS) [6] and deals with various poses. Top down approach is very time consuming and expensive due to high level model that may be failing in complex environment.

3) *Bottom-up* approaches:- Bottom- up approach use low-level elements, such as pixels or super pixels, and try to group them into semantic entities of higher levels.

4) Hybrid approach.-Hybrid method is influence of the bottom up and top down methodologies. Perceptual groupings from a bottom up approach as a rule give a decent establishment to adapt with the high number of postures.

III.PROPOSED METHODS

The steps followed in proposed method:
1) Proposed new approach for automatic segmentation of human bodies from images.
2) Combine information gathered from different levels of image segmentation, which allows efficient and robust computations upon groups of pixels that are perceptually correlated.
(3) Soft anthropometric constraints permeate the whole process and uncover body regions.
(4) 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 [8].

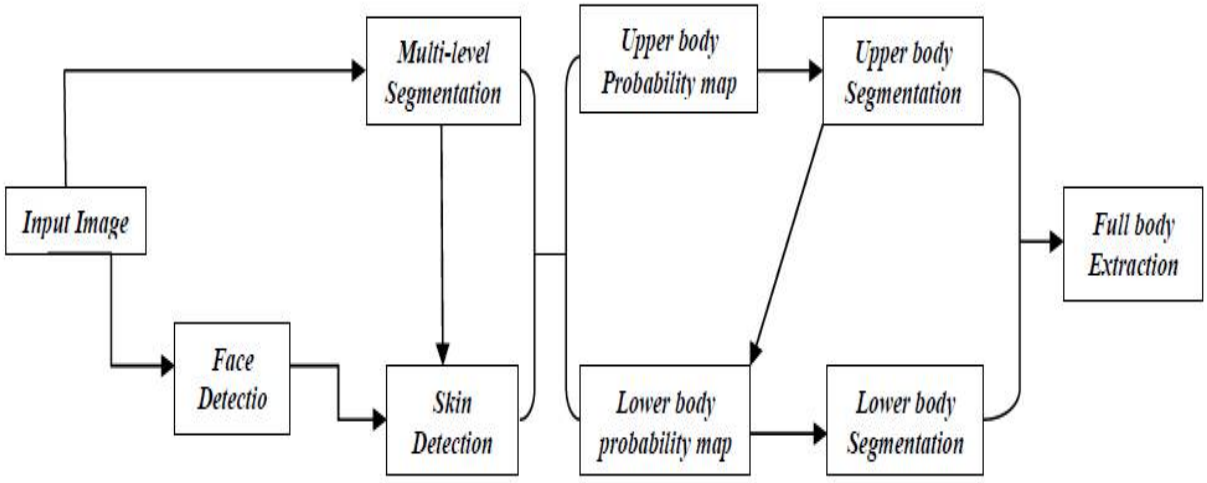

Fig 1: OVERIEW OF PROPOSED METHODOLOGY

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Skin detection algorithm:

Skin detection is the process of finding skin-colored pixels and regions in an image or a video. This process is typically used as a pre-processing step to find regions that potentially have human faces and limbs in images. Several computer vision approaches have been developed for skin detection. A skin detector typically transforms a given pixel into an appropriate colour space and then use a skin classifier to label the pixel whether it is a skin or a non-skin pixel. A skin classifier defines a decision boundary of the skin color class in the color space based on a training database of skin-colored pixels.

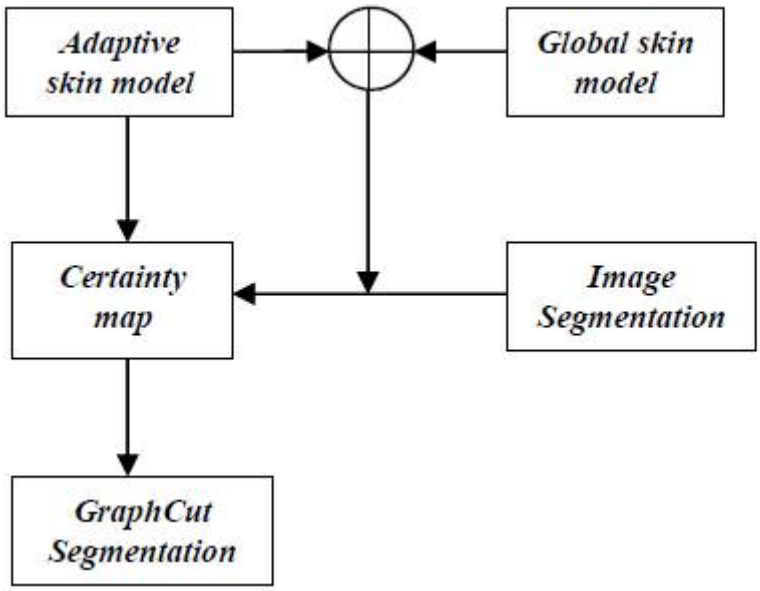

Fig 2: *SKIN DETECTION ALGORITHM*

IV. SKIN DETECTION PSEUDO CODE

1. Collecting a database of skin patches from different images.
2. Choosing a suitable color space such as RGB.
3. Find pixel in skin locus region
4. skin classifier using Baysian Approach

   P(skin|c) = P(c|skin)P(skin) ⁄ P(c|skin)P(skin) + P(c|notskin)P(notskin)

   If pixel is locus at P > T then

   Select pixel mark as white

   else

   Mark as black
5. Remove disconnected pixels
6. Result binary map of skin region and non skin region (ROI 2).
7. Stop

Step 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. Relying solely on independent pixels for complicated inference leads to propagation of errors to the high levels of image processing in complex real-world. There are several different sources of noise, such as the digital sensors that captured the image, compression, or even the complexity of the image itself and their effect is more severe at the pixel level. The characteristic of a pixel will be compared with the neighboring pixel and if found similar, the pixels are

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added to form a region. The process is carried out till edge of the region is found or the neighboring regions are above to merge.

V. RESULTS

To evaluated proposed scheme, utilized samples from the freely accessible INRIA person dataset [], which incorporates persons performing regular exercises in outside situations in for the most part upright position. This is a testing dataset, since the photographs are taken under different brightening conditions, in intensely cluttered environments, persons show up in different sorts of apparel. Proposed scheme implementation based on MATLAB 2013a 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 results are shown in following figures:

Fig 3 : Input Image: **:** Human body is captured using a camera in real time.
Fig 4: apply the skin detection algorithm.
Fig 5: After skin detection algorithm skin have to mark as a boundary. Then easily got ROI I(Region of Interest)
Fig 6: apply in image as a water segmentation.
Fig 7:After getting the result from fig6 and then apply over segmentation(super pixel) , then got ROI II(Region of Interest)

Fig 8: Finally got result from the combination of ROI 1 and ROI 2.

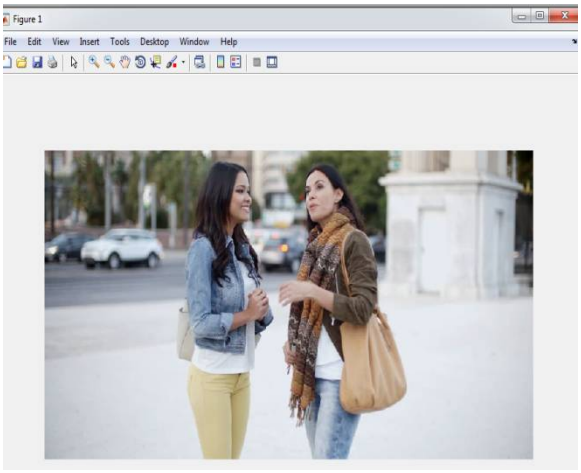

Fig 3:Input Image

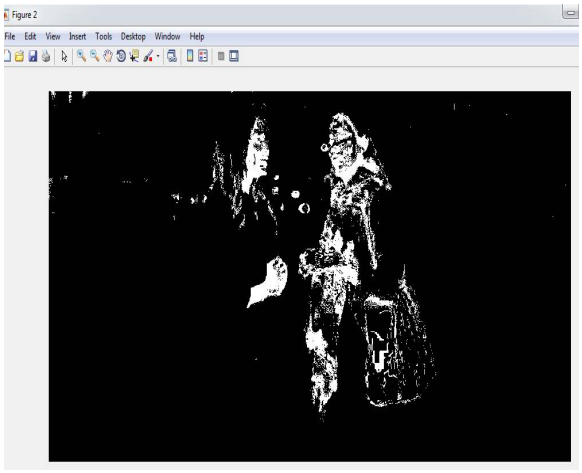

Fig 4:skin detection

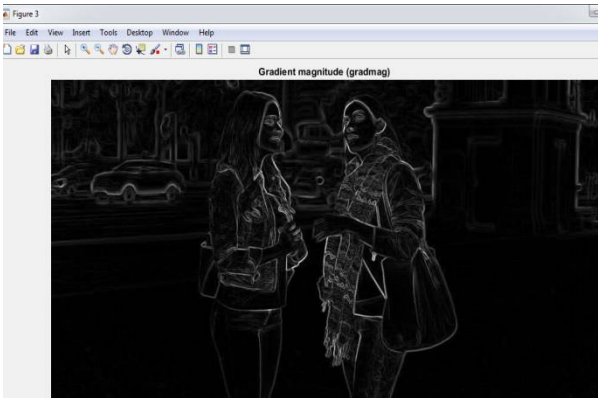

Fig 5: Skin Map (Gradient Magnitude)

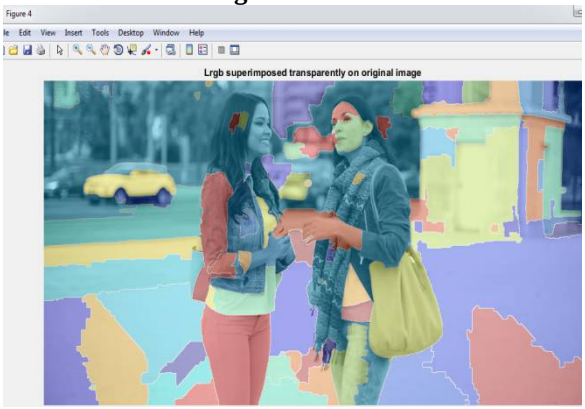

Fig 6:Segmentation

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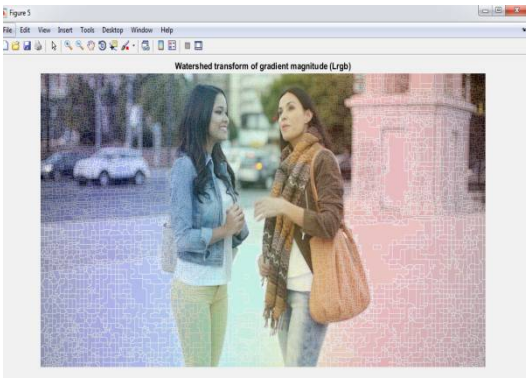

Fig 7:Over Segmentation

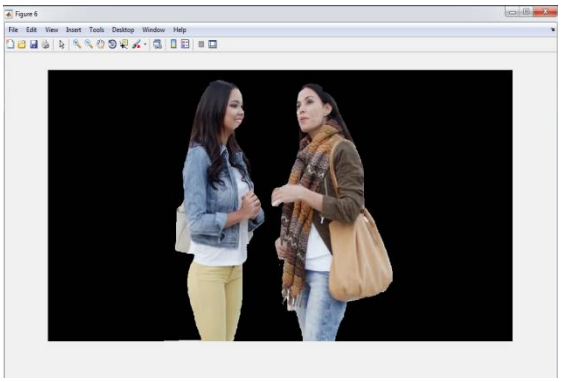

Fig 8:Final Result

VI .CONCLUSION AND FUTURE WORK

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.Proposed system presented a novel procedure for extracting human bodies from single images. It is a bottom up
approach that joints data from the multiple levels of segmentation keeping in mind the end goal to find salient regions with high capability of having a place with the human 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. In the future, mean to bargain with more intricate poses, without fundamentally depending on solid pose earlier. Issues like missing extraordinary regions, for example, hair, shoes, and gloves can be tackled by consolidation of more masks in the look for these parts; however alert ought to be taken in keeping the computational unpredictability from rising unnecessarily.

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BIOGRAPHY

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.