# SKIN SEGMENTATION BASED ON IMPROVED THRESHOLDING METHOD

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***Abstract:***
***Segmentation aim at partitioning area in the image it will be based on the shape ,color or texture.It is useful in many computer vision applications such as medical image analyzing, object detection and recognizing, forensic applications.content based image retrieval is used on the online clothing purchasing.Here our goal is to segment the clothing parts from the image on the background and the skin area.We need to detect the skin color and segment the skin from the image,and left the apparel parts in the image for matching processes.Here We Propose an improved threshold-based segmentation technique by adding a new constraint to the previous method to limit the skin tone selection.The technique improved the segmentation results correctly segmenting the apparels with the shade of purple, pale pink, and pinkish-yellow.By the simulation of the images showed that the proposed method increased the segmentation results by 27%.***

***Index terms*** **-SKIN SEGMENTATION, THRESHOLD-BASED SEGMENTATION, CBIR, GARMENT SEGMENTATION, GARMENT RETRIEVAL**

## 1.INTRODUCTION

Segmentation aims at partitioning area in the image based on color, shape or textures. It is useful in many computer vision applications such as medical image analysis, object detection and recognition, and content-based image retrieval (CBIR). Currently, CBIR has been applied in a system for purchasing clothing online [1]. Here, the goal of the segmentation process is to segment the clothing parts from the background and the model skin. After segmentation, image of the apparel parts will be passed to a matching process. Segmentation methods can be grouped into a threshold based method, region-based method, and model-based method. Gaussian Mixture Model (GMM) is an example of the model based method, graph cut is an example from region-based method [2] and method proposed by Kovac [3] is an example from threshold-based method. The threshold-based segmentation method is the fastest amongst others [2]. The color thresholding rule proposed by Kovac has been applied to segment the face for tracking purposes. The method developed a thresholding rule in RGB color space aims at handling different illumination conditions. It enabled a wide color range, such as some shades of purple, pale pink, and pinkish-yellow to be segmented as skin tone. Thus, the scheme cannot be applied directly to segment the skin from apparels, since many types of apparel have some shades of pink, pinkish-yellow, and purple. Figure 1 illustrates the application of Kovac's color segmentation rule to purple, pale pink and pinkish-yellow garments. The first column shows the original image, the second and the third columns show the segmented skin and clothing area detected by applying Kovac's rule respectively. In the first row, Kovac's method segmented the pale purple garment as skin, left only some part of shoes, eyes, and scarf as garment. In the second row, it segmented pale pink in the apparel as skin, resulted in a non-complete clothing detection. The garment in the third row was completely segmented as skin. We found that the rule was too loose in classifying the skin tone. In this case, the scheme classified the color such as purple, pinkish-yellow as skin tone. It yielded a false segmentation of the garments if they have similar colors. We propose an improved thresholding method for segmenting the skin from the apparel image. We add a new constraint to the Kovac's thresholding rule. The technique improved the segmentation results by correctly segment the apparels with the shade of purple, pale pink, and pinkish yellow. Simulations on total 100 garment images showed that the proposed method increased the segmentation rate by 27%. The rest of this paper is organized as follows: section two introduces the background theory. Section three presents the proposed method. We present the results, discussion and conclusion in section four and five respectively.

## 2. EXISTING METHOD

The color thresholding rule proposed by Kovac's has been applied to segment the face for tracking purposes. This method developed a thresholding rule in RGB color space aims at handling different illumination conditions. It enabled a wide color range.It is applied to some shades of purple, pale pink, and pinkish-yellow to be segmented as skin tone.The Kovac's method segmented the pale purple garment as skin, left only some part of shoes, eyes, and scarf as garment.The threshold values of the kovac's rule is greater and it cannot clearly segments the skin part which is related to the clothing area.the drawback of the kovac's method is that the eyes,lips and nose were also segmented.

$$\begin{cases} R > 220\ AND\ G > 210\ AND\ B > 170\ AND \\ |R - G| \leq 15\ AND\ R > G\ AND\ G > B \end{cases}$$

## 3.PROPOSED METHOD

In the proposed method we are implementing the improved thresholding method techniques for segmenting the skin from the image.Here we are adding new constraints to the kovac's rule.This technique improved the segmentation results by correctly segmenting the apparels with the shades of purple, pale pink, and pinkish-yellow.By simulating this technique on the 100 images it is showed that the proposed method increases the segmentation results by 27%.The proposed method can segment the skin from all the images,But some parts such as eyes,lips were considering the clothing area can't segment correctly.The proposed segmentation is obtained by adding the kovac's rule.The value of the G must be greater than B.The proposed constraint equation is as follows:

$$\begin{cases} R > 95\ AND G > 40\ AND B > 20\ AND \\ max\,(R,G,B) - min(R,G,B) > 15\ AND \\ |R - G| > 15\ AND R > G AND R > B \\ G > B \end{cases}$$

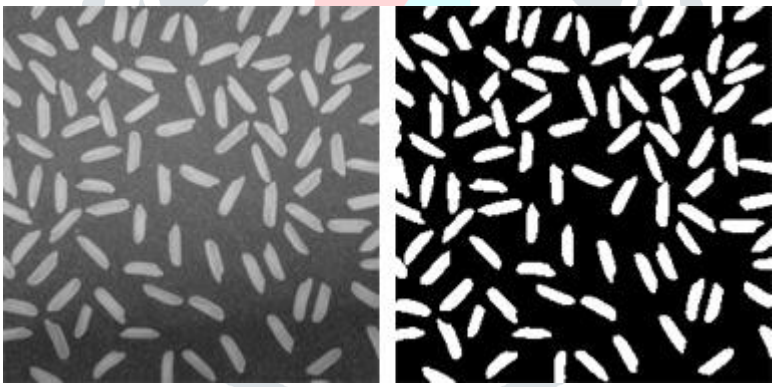
## 3. IMAGE SEGMENTATION

In laptop vision, image segmentation is that the method of partitioning a digital image into multiple segments . The goal of segmentation is to vary the presentation of a picture into one thing that's a lot of significant and simple to research.[1][2] Image segmentation is often used to find objects and recognize in images. Image segmentation is the process of assigning a label to every pixel in an image such that pixels with the same label will share their certain characteristics.

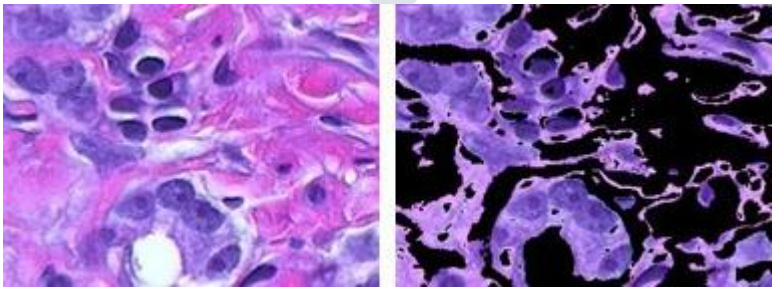
The results of image segmentation may be a set of segments that cowl the complete image, or a set of contours extracted from the image. Each of the pixels in a region are similar with respect to some characteristics or computed property, such as color, intensity, or texture. Adjacent regions are considerably completely different with reference to a similar characteristic(s).[1] once applied to a stack of pictures, typical in medical imaging, the results after image segmentation is used to produce 3D reconstructions with the assistance of interpolation algorithms like march cubes.

Image segmentation is that the method of dividing a picture into multiple components. This is generally used to establish objects or alternative relevant data in digital pictures. There are many various ways in which to perform image segmentation, including:

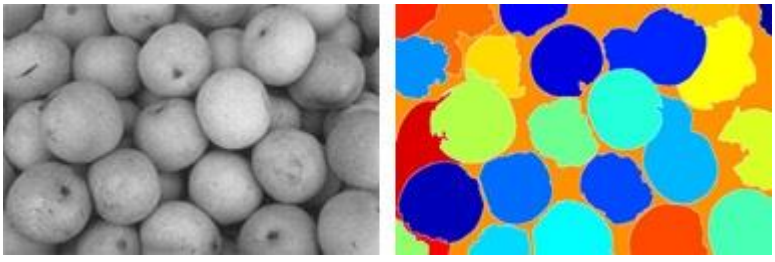
- Thresholding methods such as Otsu's method



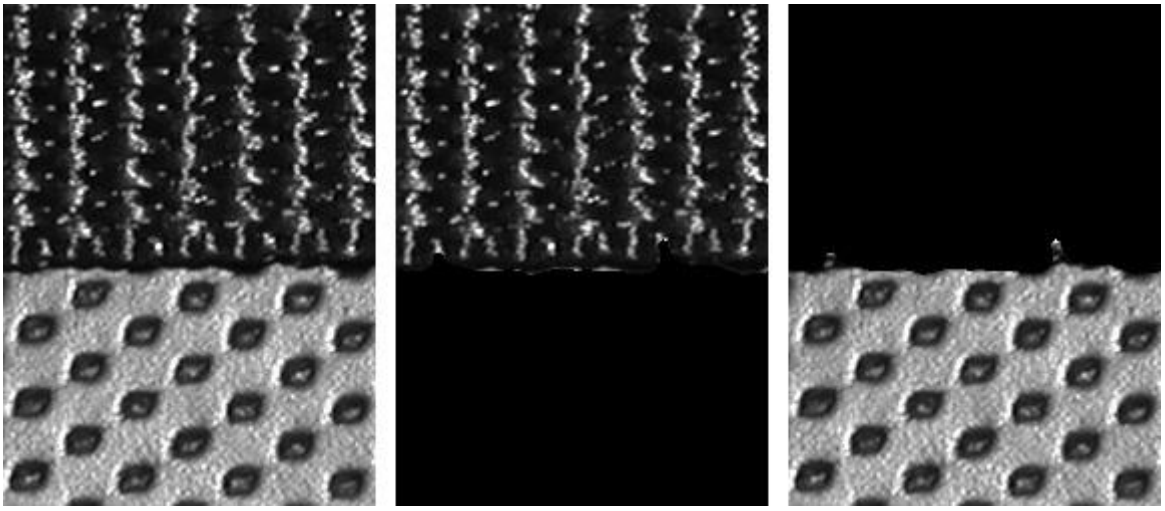
- Color-based Segmentation such as K-means clustering



- Transform methods such as watershed segmentation



- Texture methods such as texture filters



An effective approach to performing image segmentation includes using algorithms, tools, and a comprehensive environment for data analysis, visualization, and algorithm development.

**5.SKIN SEGMENTATION:**

Binary skin classifiers The ways thought of in this paper separate skin and non skin colours employing a piecewise linear call boundary. These explicit skin cluster strategies propose a collection of fastened skin thresholds in a very given color area. Some color spaces permit searching skin color pixels in the 2D chromatic space, reducing dependence on lighting variation, others, such as the RGB space, address the lighting problem by introducing different rules depending on illumination conditions (uniform daylight, or flash). Working within different color spaces, we have implemented the six different algorithms analyzed in this paper. They are named for the color space adopted: YCbCr4 , RGB5 , HSV16 , HSV27 , HSI8 and rgb9 . The details of their implementation can be found in the referenced papers and are summarized in the subsections here below. Examples of the skin maps obtained applying these ways to the image of Figure 1a are shown in Figures 1b-1g. Some of these strategies, such as YCbCr (1b) and HSI (1f), are more recall oriented, some, such as HSV1 (1d) and rgb (1g), more precision oriented, while still others, such as RGB (1c) and HSV2 (1e), show a good tradeoff between recall and precision.

5.1 YCbCr Chai and Ngan4 develop an algorithm that exploits the spatial distribution characteristics of human skin color. A skin colour map comes and used on the chrominance parts of the input image to sight pixels that seem to be skin. The algorithm then employs a set of regularization processes to reinforce those regions of skin-color pixels that are more likely to belong to the facial regions. We use only their color segmentation step here. Working with the YCbCr are the authors noticed that the ranges of Cb and metallic element are most representative for the skin-color reference map.

5.2 Genetic algorithmic rule Genetic Algorithms (GAs) are adaptive heuristic search algorithms supported the evolutionary ideas of selection and genetic science. The GAs treat optimization problems as the competition of populations of evolving individuals (chromosomes), each considered as a candidate solution. A 'fitness' operate evaluates every resolution to make a decision whether or not it'll contribute to future generation. Then, through operations analogous to factor transfer in biological replica (selection of fogeys, crossover, replacement, and mutation), the algorithm produces a new population of candidate solutions. Due to their random nature, GAs not only provide good solutions for optimization problems but also consistently outperform more traditional methods, improving the chances of finding a global solution. Whereas most stochastic search methods operate on the concept of a single solution, genetic algorithms operate on a population of solutions. The main steps of GAs can summarized as follows: 1. Define a fitness function on which to base the criteria for the selection of those individuals of a population who will generate the next generation. 2. Define evolution methods (selection of fogeys, crossover, replacement, mutation, and migration) three. Randomly generate an initial population of solutions (chromosomes). 4. Compute and store the fitness for each individual in the current population 5. Generate the next population, selecting and evolving individuals from the previous population applying criteria based on survival of the fittest. 6. Repeat step 4 until a satisfactory solution is obtained.

**6.RESULTS:**

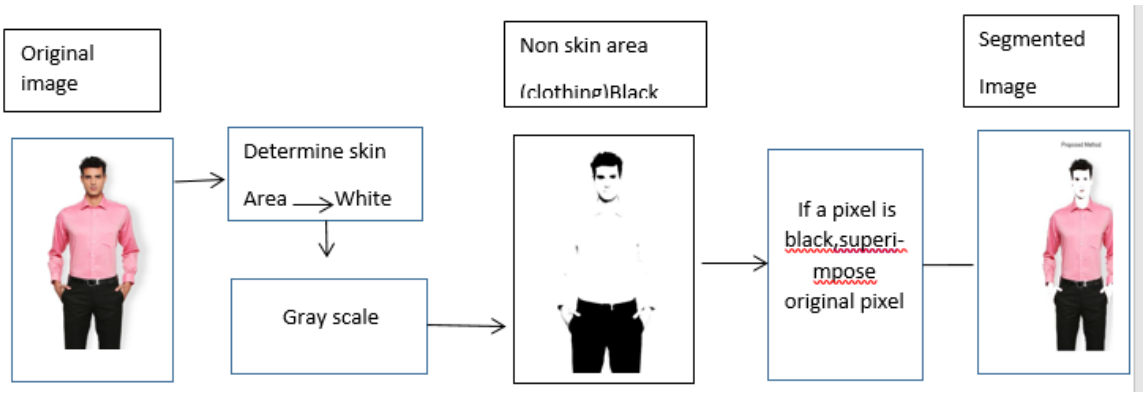



**Fig:Threshold-Based Segmentation**

**Steps:**

1. Determine the skin area on the original image, and then set the pixels into white.
2. Convert the Image into grayscale.
3. Convert the grayscale part of the image from step 2 to black,then will be turn into black and white.
4. If a pixel is black superimpose the original pixel.
5. The superimposing of the black pixel will be resulted in the Segmented clothing of pixel.

## 7.CONCLUSION:

1. We have presented the impact of adding a new constraint to the kovac's skin segmentation rule for clothing segmentation.

2. The proposed method will segment all over the skin from all those images,But it will not segment eyes and lips are considering the clothing area.

3. The existing method proposed skin segmentation only for islamic womens clothing general fashion images for women,But this proposed method will segment any type of Skin area.

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