International Journal of Scientific Research in Engineering and Management (IJSREM)
Volume: 04 Issue: 04 | April -2020 ISSN: 2582-3930

DETECTION USING NORMALIZED rgb: A COMPARATIVE STUDY

S.Sajitha Kumari, Assistant Professor, Department of Information Technology,
Bethlahem Institute of Engineering, Karungal. pin 629157. Kanya kumari Dist

ABSTRACT

In this paper, a color image is converted to TSL color Space and Normalized RGB and then applied the threshold values. Extract the skin color from the original color image. This method has been applied for Non Adaptive and adaptive skin color. In Non adaptive and adaptive skin color finding mean value for RGB color Space and by applying the threshold value for extracting the skin color from the original image. Each image and its sequence is aggigned by variying classifier of skin color. The preliminary step is the skin color region segmentation in several color spaces. Normalized rgb could be implemented in adaptive skin color classifier and non adaptive skin color by applying the threshold value. After finding Normalized rgb be infer zero pixel value as skin color and one as non Skin color. Skin color detection techique can be a n useful tool for face detection,tracking and localization.

Keywords: *Skin Detection, Normalized RGB, Adaptive skin color classifier, Non adaptive* skin *color.*

1. INTRODUCTION

The skin segmentation is done by identifying the pixel color and associated information, based on which the calibration is made to identify the skin color. Researchers identified, that this can be a proven and effective technique for almost all cases of human interaction.

This work uses the skin detection techique for the same. In the modern world, face detection is important in various applications like Face recognition, HCI, and surveillance and database management of human face. The challenging task is automatic Face detection. In that conditions, we may impart any one class classifiers for skin model with diffreent color transformations (Normalized RGB, HSV, and YCrCb).

Most of the computer based applications for visual presentation benefits from the skin color classification. However, because of the different real time conditions like illumination, settings in camera, shadows and many more the skin detection may be challenging. By extracting the information about the previously known pixels of different skin color can be useful for a face detector. This technique can be easily used to differentiate hair color, lip color and eyebrows. This techniqu has high spped and can be used for real life applications.

In the first stp, a skin map is to be formed. This can be done with determining the pixels of three component rgb with arithmatic operators in normalized form. The technique is futuristic, since it uses normalized rgb for known regions of skin. The candidate regions are the regions where the regions of skins were identified and transformations from rgb color space and fast transformations. The main building of skin detector is its speed in detecting the skin regions**.**

2. CLASSIFICATION AND COLOR MODELING

It is known that the light intensity is important parameter than the crominance in skin detection. Therefore, for a skin detection suitable color model is important. The different color models are basic color models, which includes RGB, normalized RGB, the perceptual color models like HSL,HSV,HSI,TSL and the final

ones are orthogonal models of color, which may include YIQ,YcbCr,YES and YUV. From these, three models, we may choose TSL, which considers more on illuminance than crominance. The following equations vcan be usedto generate a non-linear variations of RGB model.

a) Normalized rgb

By converting the normal RGB into a normalized RGB can remove the influence of variation in intensity. To obtain the normalized RGB from the RGB color space the following equations can be used:

g = G/(R+G+B);

r = R/(R+G+B);

b = B/(R+G+B);

A simple normaliztion procedure can be followed to obtain the normalized rgb. We will look into the color spaces, rules and boundaries in the following section.

b) TSL color space

TSL is a important tool in the color space which can be used for face detection based on saturation, lumination and tint.

The transformation to TSL from RGB is:

$$T = \begin{cases} \frac{1}{2\pi}\arctan\frac{r'}{g'} + \frac{1}{4}, if g' > 0 \\ \frac{1}{2\pi}\arctan\frac{r'}{g'} + \frac{3}{4}, if g' < 0 \\ \frac{1}{2} if g' = 0 \end{cases}$$

$$S = \sqrt{\frac{9}{5}(r'^2 + g'^2)}$$

L=0.299R+0.587G+0.114B

By utilizing simple normalization with the values of the saturation as [0, 1.0] for the value of tint based on the minimal value calibration.

$$S = (S - MinS)/(MaxS - MinS)$$

$$T = (T - MinS)/(MaxT - MinS)$$

ST scaled color space can be roughly represented by high fast segmentation. The segmentation system stays simpler, and remains effective, since only a little percentage of the ST space representing skin is excluded.

$$\begin{cases} T > 0.996 \\ T < 1.010 \\ S > -2.000 \\ S < 2.00 \end{cases}$$

3. ADAPTIVE SKIN METHODS

a) Non adaptive skin color classifier

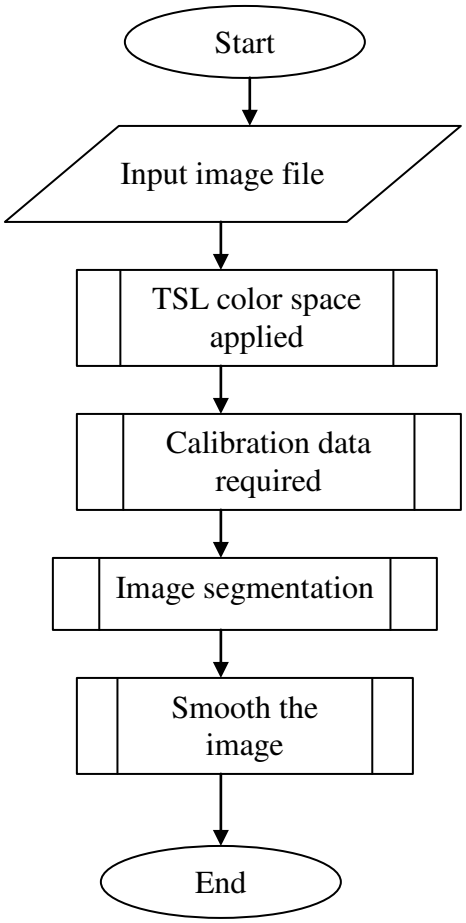
We adapt this classifier to the illumination conditions of each image which are determined by settings in camera, source of light, shadow formation and other parameters. We adapt the classifier to the group of the person of ethnic orgin. That means we have to make the upper and lower bounds variable.

$$skincolor = (R_c > 0.35) \cup' (R_c < 0.5) \cup' (G_c > 0.2) \cup' (G_c > 0.7) \cup' (base > 200 base)$$

b) Adaptive skin color classifier

$$skincolor = (R_c > lbR) \cup' (R_c < ubR) \cup' (G_c > lbG) \cup' (G_c > ubG) \cup' (base > lbbase)$$

Flow Chart



4. EXPERIMENTS

This paper explains the skin detection which may be used for special benefit in identifying facial marks like teeth, eye, lips etc detected correctly as non-skin color objects. Skin segmentation using multiple thresholding helps to differentiate non skin and skin color using a precise linear boundary.

Original Image

Smoothed Image

Fig (1) Color model

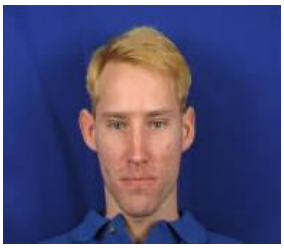


Fig (2).TSL Color Space

Fig (3).Normalized RGB

Fig (4) NonAdaptiveSkinColor

Fig (5) Adaptive Skin Color

5. CONCLUSION

The parametric classifier technique has been used inn this paper for different image conditions and the group of the persons on the image. Result shows that a significant increase in poor lighting and for ethnic people of different skin color. Skin segmentation using multiple thresholding helps to differentiate skin colors by utilizing a precise decision boundary. When compare with other color models normalizes rgb is more precise oriented. Normalized rgb performs almost equally and much better than the others.

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