FACE DETECTION SYSTEM BASED ON COLOR TONE WITHIN IMAGE FRAME USING IMAGE PROCESSING TECHNIQUE

Harish A. Bambal, Dr.V. L. Agrawal

BE in Electronics And Telecommunication, Associate Professer And HEAD PH.D, M.E.,B.E. (ENTC)
Department Of Electronics & Telecommunication
HVPM College Of Engineering and Technology, Amravati, INDIA.

Abstract : In today's digital world the major controversy is substantiate and identification. In substantiate and identification the eloquent role is face detection. In real time application face detection and skin detection becoming a challenging task. Human face detection systems have gained a considerable attention during last decade due to its vast applications in the various fields and advantages over previous biometric methods. There are many applications with respect to security, sensitivity and secrecy. Face detection is the most important and first step of recognition system. This project introduces a new approach to face detection systems using the skin color of a subject. This system can detect a face regardless of the background of the picture, which is an important phase for face identification. The images used in this system are color images which give additional information about the images than the gray images provide. In face detection, the two respective classes are the "face area" and the "non-face area". This new approach to face detection is based on color tone values specially defined for skin area detection within the image frame. This system first resizes the image, and then separates it into its component R, G, and B bands. These bands are transformed into another color space which is YCbCr space and then into YCbCr space (the skin color tone). The morphological process is implemented on the presented image to make it more accurate. At last, the projection face area is taken by this system to determine the face area**.**

IndexTerms - **Content Based Image Retrival, Clustring, Region Based Image Retrival, CBVIR, CBIR.**

I. INTRODUCTION

With the development of information technology and pattern recognition, the authentication based on face detection began to apply in finance, security and other fields. Face detection become a hot subject of research currently. Face detection is a key technology of face recognition, which began in the 1960s. Furthermore, face detection is the first step in human computer interaction system. Early face detection algorithm is mainly based on spatial characteristics, such as template matching and other simple features. However, the algorithm is poor adaptability because of variability in facial expression, pose, and lighting condition. After decades of development, the current face detection algorithms are mainly divided into two large categories based on the structure and pixel. The algorithm based on the structure detects faces use the spatial distribution of facial features. Viola and Jones presented a face detection algorithm using boosted cascade of Haar-like features, which is the classical algorithm based on facial structure. Pixel-based algorithm one of the best applications of image analysis and understanding is face detection. Face detection is one of the challenging task Face detection means that a system having power to find that there is a human face present in an image or video. It is one of the great technologies in image processing. when we are communicating with people, we normally look at his face; the person's face expression plays vital role at the time of communication. In many applications the face detection step is very much important such as face recognition, video surveillance and large-scale retrieval system [2]. Images of faces vary greatly rest on pose, facial expression and occlusion.

II. LITRATURE REVIEW

S.No	Authors	Title	Year	Methods	Performance
1	Anima Majumder L. Behera and Venkatesh K Subramanian	Retinopathy Online Challenge: Automatic Detection of Microaneurysms in Digital Color Fundus Photographs	2020	**Feature Base Face Detection**	The estimation of detection region for features like eye, nose and mouth enhanced the detection accuracy 88%.
2	D. Klein, B. E Klein, S. E Moss	The Wisconsin epidemiologic study of diabetic retinopathy VI Diabetic non proliferative retinal lesions		cascade detector.	Skin Color Modeling (SCM) accuracy of 72%
3	Michael Goldbaum,Saied Moezzi,	"Automated diagnosis and image	2019	cascade detector.	Separate Haar Feature get 80% of accuracy.
4	Chaudhuri, S., Chatterjee, S., Katz, N., Nelson, M., and Goldbaum, M.,	Detection of blood vessels in retinal images using two-dimensional	2019	Oriented language model	Naive Bayes is the most precise model, with a precision
		matched filters			of 88.35%
5	Khamar Basha Shaika , Ganesan P	Comparative Study of Skin Color Detection and Segmentation in HSV and YCbCr Color Space	2015	HSV	The HSV based detection is best suited for simple images with uniform background with 87% accuracy
6	] S. Omanovic, E. Buza, and I. Besic,	'RGB ratios based skin detection,''	2019	RGB	skin detection modeling contains 90% accuracy
7	H. Bouirouga, S. El Fkihi, A. Jilbab, and M. H. Bakrim	A comparison of skin detection techniques for objectionable videos	2020	Skin detection Techniques	Skin detection is a significant step for a wide range of 78% with accuracy
8	Y. Zhou, G. Jiang, and Y. Lin,	''A novel finger and hand pose estimation technique for real-time hand gesture recognition,'	2021	pattern recognition	Skin detection is performed as an initial step in most humans related image processing applications contains 52% accuracy
9	M. Islam, P. A. Watters, and J. Yearwood,	'Real-time detection of children's skin on social networking sites using Markov random field modelling,	2019	Markov random field modeling =	The detected of the skin regions are usually processed with 80% accuracy
10	A. A. Zaidan, H. A. Karim, N. N. Ahmad, B. B. Zaidan, and A. Sali,	''A four-phases methodology to propose anti-pornography system based on neural and Bayesian methods of	2021	Bayesian methods	hand detection, gesture recognition, video surveillance applications
		artificial intelligence			
11	] K. B. Shaik, P. Ganesan, V. Kalist, B. S. Sathish, and J. M. M. Jenitha,	''Comparative study of skin color detection and segmentation in HSV and YCbCr color space,	2021	YCvCr	All these application with YCvCr model contains 88 % accuracy
12	K. Nallaperumal, S. Ravi, C. N. K. Babu, R. K. Selvakumar, A. L. Fred, S. S. Vinsley, and S. Christopher,	'Skin detection using color pixel classification with application to face detection: A comparative study,'	2020	face detection using pixel Classification	Skin tone detection include 75% accurate results
13	A.-S. Ungureanu, H. Javidnia, C. Costache, and P. Corcoran.	''A review and comparative study of skin segmentation techniques for handheld imaging devices,'	2021	Segmentation	aimed to come up with best suitable color space gives the 87% accuracy
14	P. Kakumanu, S. Makrogiannis, and N. Bourbakis,	'A survey of skincolor modeling and detection methods,''	2021	Skin color modeling	The reviewed various approaches that use skin-color and the most appropriate color space but the missed the dataset. skin detection modeling contains 90% accuracy
15	Q. M. Yas, A. A. Zaidan, B. B. Zaidan, B. Rahmatullah, and	''Comprehensive insights into evaluation and	2020	Skin detection modeling	cskin detection modeling contains 90%
	H. A. Karim,	benchmarking of real-time skin detectors:			accuracy

16	W. Kelly, A. Donnellan, and D. Molloy,	''Screening for objectionable images: A review of skin detection techniques	2019	RGB modeling	skin detection modeling contains 90% accuracy
17	V. K. Verma, S. Srivastava, T. Jain, and A. Jain,	Local invariant feature-based gender recognition from facial images," Soft Computing for Problem Solving	2020	Facial Recognisation	Facial recognition model contains 98% accuracy
18	L. Zhuo, Z. Geng, J. Zhang, and X. guang Li,	"ORB feature ased we pornographic image recognition," Neurocomputing	2021	ORB features	Automated images face recognition is implemented by using three supervised learning machines, which are adobos, neural network, and SVM having 90% of accuracy
19	R. Zhu, X. Wu, B. Zhu, and L. Song	"Application of pornographic images recognition based on depth learning,"	2019	oaa model	which is very useful for mechanical technology like robotics and interaction between humans
					and computers. The hand detection of CNN having 95% accuracy of datasets
20	Hussein Ali Hussein Al Naffakh1 , Rozaida Ghazali2 , Nidhal Khdhair El Abbadi3 , Ali Nadhim Razzaq4	A review of human skin detection applications based on image processing	2021	stegnography	The currently used steganography have 80% of accuracy

III. METHODOLOGY

Human skin color has been used and proven to be an effective feature in many applications from face detection to hand tracking. Although different people have different skin color, several studies have shown that the major difference lies largely between their intensity rather than their chrominance [7], [25], [26]

3.1 Knowledge-based method

In this approach, face detection methods are developed based on the rules derived from the researcher's knowledge of human faces. It is easy to come up with simple rules to describe the features of a face and their relationships. For example, a face often appears in an image with two eyes that are symmetric to each other, a nose, and a mouth. The relationships between features can be represented by their relative distances and positions. Facial features in an input image are extracted first, and face candidates are identified based on the coded rules. A verification process is usually applied to reduce false detections. One problem with this approach is the difficulty in translating human knowledge into well-defined rules. If the rules are detailed (i.e., strict), they may fail to detect faces that do not pass all the rules. If the rules are too general, they may give many false positives. Moreover, it is difficult to extend this approach to detect faces in different poses since it is challenging to enumerate all possible cases. On the other hand, heuristics about faces work well in detecting frontal faces in uncluttered scenes. Yang and Huang used a hierarchical knowledge-based method to detect faces [18]. Their system consists of three levels of rules. At the highest level, all possible face candidates are found by scanning a window over the input image and applying a set of rules at each location. The rules at a higher level are general descriptions of what a face looks like while the rules at lower levels rely on details of facial features. Knowledge based methods are rule based methods that describe a face based on rules. The approach suffers from the difficulty of coming up.

3.2 SMQT Features and SNOW Classifier Method

This method consists of two phases. The first phase is face luminance. The operation of this phase is being performed to get pixel information of an image and further implemented to detection purpose. The second phase is detection. In this phase, local SMQT features can be used as feature extraction for object detection. The features were found to be able to cope with illumination and sensor variation in object detection. The split up SNOW is proposed [6] to speed up the standard SNOW classifier [1]. The split up SNOW classifier requires only training of one classifier network which can be arbitrarily divided into several weaker

classifiers in cascade. Each weak classifier uses the result from previous weaker classifiers which makes it computationally efficient [1,6].

### 3.3 Gabor-Feature Extraction and Neural Network Method

This method is based on Gabor-Feature Extraction and Neural Network which has the following steps [3,7]: 1- Prepare images in face and non-face folders for network training phase. 2- Extract Gabor features. 3- Train the network based on image features 4- Scan the whole image for faces.
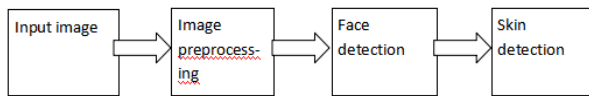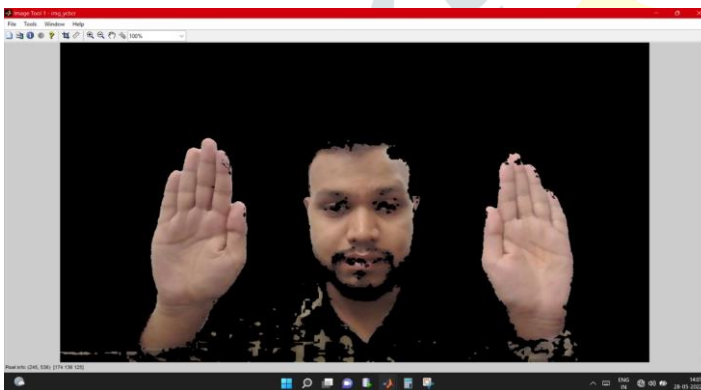

IV. RESULTS

In this photograph we can without difficulty see that input picture of person is filtered from other gadgets the use of face detection. When this device works we are able to see the pores and skin tone segregation and coloration tone detection.

this is original image
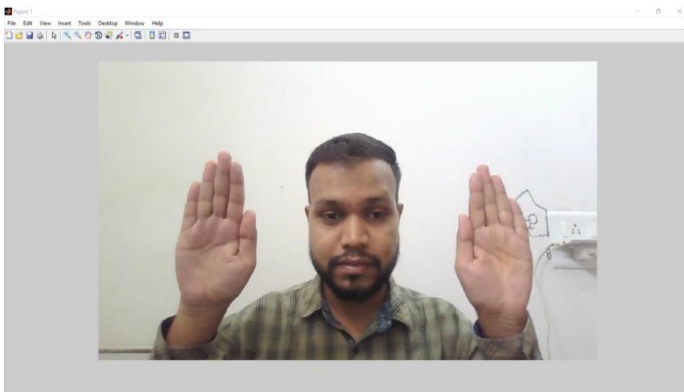
Output image with face recognition with matlab

CONCLUSION

This paper surveys the different algorithms and methodologies associated with the land classification and in this paper, it has been attempted to identify a method for detecting the nutrient level in the soil. Organic matters play a vital role in soil health. Uses of organic matters are good in séance of increasing water-holding capability and to provide major, minor, and micronutrient to the plant. The good classifier should handle diversity in the land. It should be hierarchical for deep classification with maximum accuracy. The level of nutrients will be helpful for farmers for the further recommendation of fertilizers. Fuzzy Logic with a rule-based system is highly modified and can perform more accurate results of classification. On the other hand, binary classification is a basic and fast approach, however, its accuracy is low as compared to the fuzzy logic system.

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