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Analyzing and Detecting Employee's Emotion For Amelioration Of Organizations

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Abstract

These days employees well- being is the most growingly pertinent and mandatory consideration in the modern workplace of any organization. Until recently, emotions were considered a forbidden topic in the working place. They were no person's concern, and they had no place in business. They were not allowed to discuss it and those issues must always be left at home. Today, research on how emotions affect inventiveness, production, and profession success has put a jaunt on the subject. They are realizing that how well they elicit and sustain positive emotional states in their employees plays a major role in their organization's victory or defeat. This is because emotions directly influence the five major sources of competitive advantage in today's marketplace: Intellectual Capital, Customer Service, Organizational Reactivity, Production, Employee appeal and retentivity. By becoming more knowledgeable about how emotions affect the primary sources of competitive advantage, organizations can help their management team recognize the critical connection of employee's emotions and then try to make it right before it affects the productivity. In this paper, the proposed approach to the problem of employee's emotions are resolved by detecting their emotions using C#. At the time of entering into the organization, face of the employees are captured to analyze their emotions and stored in the database.

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1. INTRODUCTION

Until recently, emotions were considered a forbidden topic in the working place. They were no person's concern, and they had no place in business. They were not allowed to discuss it and those issues must always be left at home. They are realizing that how well they elicit and sustain positive emotional states in their employees plays a major role in their organization's victory or defeat. This is because emotions[1] directly influence the five major sources of competitive advantage in today's marketplace: Intellectual Capital, Customer Service, Organizational Reactivity, Production, Employee appeal[4] and retentivity. By becoming more knowledgeable about how emotions affect the primary sources of competitive advantage, organizations can help their management team recognize the critical connection[2] of employee's emotions and then try to make it right before it affects the productivity. This concept can detect any human's emotions[5] from the employee's image captured as they enter the organization.

2. RELATED WORKS

1. EMOTION RECOGNITION BASED ON BRAIN-COMPUTER INTERFACE SYSTEMS:

The emotional state of a person defines their interaction with other person. Hence, the human emotions recognition is becoming a concern in the development of systems that require human and machine collaboration[11].

2. EMOTION DETECTION FROM TEXT:

In this paper, methods which are currently being used to detect emotion from text are reviewed[10] along with their limitations and new system flow is advanced, hence will perform efficiently.

3. SYSTEM ARCHITECTURE

The proposed approach to the problem of employee's emotions for the amelioration of organizations are resolved by detecting their emotions using C#. At the time of entering into the organization, face[3] of the employees are captured to analyze their emotions and stored in the database. The system flow is that as people enter the organization to swipe their card in order to prove their presence at work. We have designed a new system, as a replacement to these cards or with respective to these we make use of the camera's to capture the face of the employee's entering the organization in Fig.1. As each face is captured they are analysed simultaneously and results are displayed. The system takes the image captured live from a camera. Once this is done, by skin colour segmentation, it detects the person's skin colour and then his/ her face. The eye and lip parts of the face are separated. The Bezier curve is drawn for the eyes and lips. Comparison between the Bezier curve drawn and which is present in the database is done for the eyes and lips. Finally the closest Bezier curve is taken from the database and shows the emotion. Hence the emotion is detected. The outcome of the analyzing performed is the emotion of each employee. It shows whether they are happy, sad, depressed or angry. This analyzing makes a better working environment for a better productivity.

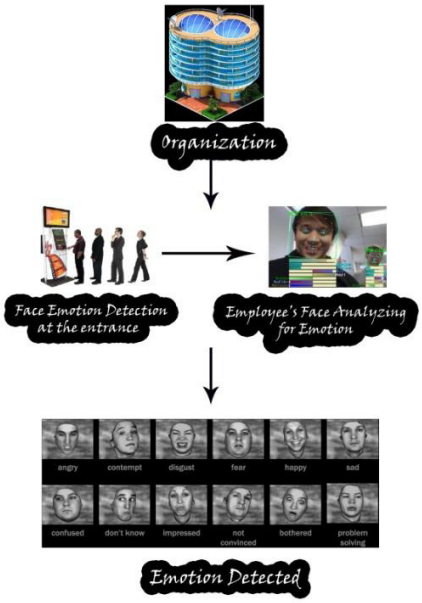

Fig. 1 EMOTION DETECTION ARCHITECTURE

4. RESULTS

In this paper, the proposed approach to the problem of employee's emotions are resolved by detecting their emotions using C#. First we design an application in Fig.2 to take the live image captured and process its emotions.

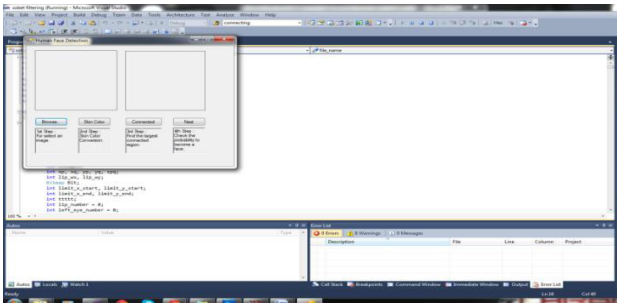

Fig. 2 OUTLOOK OF THE TEMPLATE FOR EMOTION DETECTION

First we perform the skin colour segmentation in Fig.3. To do this we must contrast the image. Once this is done the largest connected area must be found. Probability of that to become a face of a larger connected area must be checked. If this is possible to bring out a face, then a new form will open with the largest connected area. The height and width of the largest connected area must be equal or larger than 50 and its ratio must be among 1-2, then it is a face.

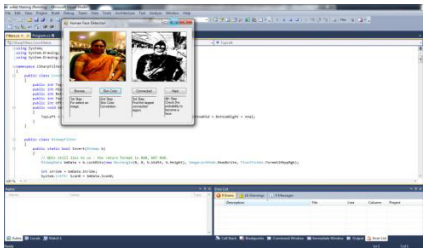

Fig. 3 SKIN COLOUR SEGMENTATION

We have to convert to binary image from a RGB image in order to perform face detection. We calculate the average[7] value for each pixel in RGB. If the value is below 110, we restore it with black pixel. Otherwise we restore it with white pixel. As a result we get the RGB image as a Binary Image in Fig.4.

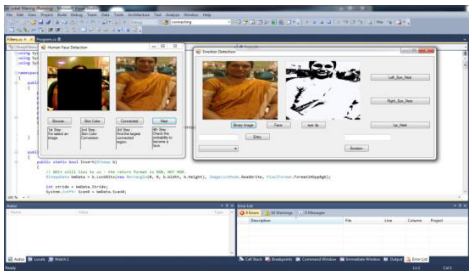

Fig. 4 CONVERSION OF NORMAL IMAGE TO BINARY IMAGE

Next step is to figure out the forehead[8] from the binary image. To do this the middle part of the image is where the analyzing begins from. After that a constant black and white pixels are searched. Maximum width of the white pixel from left and right side of the image is searched. As a result if a newly retrieved width is smaller half of the previous width, then we snap the search because if it reaches the eyebrows then such a situation will arise. Finally we cut the face[6] from forehead and its height would be 1.5 times its width. Then we will have an image which will have only the main parts of the face. Finally the RGB[9] image is cropped according to the binary image. The face is extracted in Fig.5.

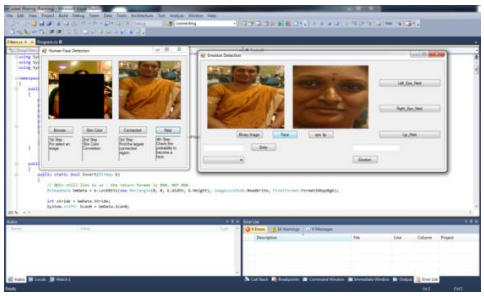

Fig. 5 FACE CROPPED

4.1.Detection Of Eyes And Lip

The detection of eyes and lips are performed. To do this we convert the RGB face to binary. Let us take the width of the face as W. We examine from the W/4 to {W-W/4} to figure out the center position for the two eyes. The highest white constant pixel along the height among the ranges is the center position for the two eyes.

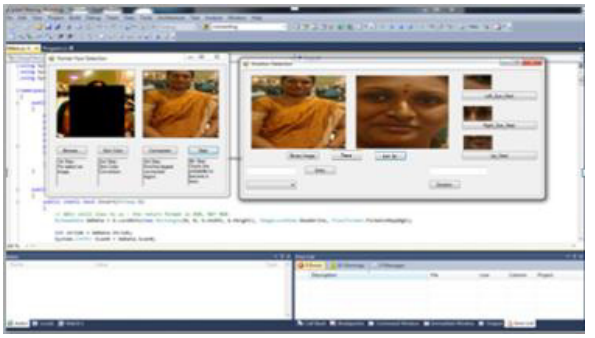

Fig. 6 EYES AND LIPS DETECTED

The left eye in Fig.6 is concentrated on first. We analyze w/8 to mid and for right eye we search mid to w – w/8. w is width of the image extracted and mid is the middle position of the two eyes. Next we find for the two eyes the lower position by examining its black pixel vertically. For left eye, we examine from the mid/4 to mid-mid/4 width. Whereas for the right eye, we examine mid+(w-mid)/4 to mid+3*(w- mid)/4 width from lower part of the image lower to the starting position of the eyebrow. Then we find the right part of the left eye by examining black pixel horizontally. This is done from the mid to the starting of black pixels among the upper and lower position of the left eye. Next for the left part for right eye, we examine the mid to the starting of black pixels among the upper and lower position of right eye. The left part of the left eye is the starting width of the image and the right part of the right eye is the ending width of the image.

The lip detection requires, a lip box. And we must ensure that the lip must be placed into the lip box. The lip detection is also done by using the bezier curve.

4.2.Applying Bezier Curve On The Eyes And Lip

In the lip box, there is lip and may be some part of nose. So, around the box there is skin colour or the skin. So, we convert the skin pixel to white pixel in Fig.7 and other pixel as black. We also find those pixels which are similar to skin pixels and convert them to white pixel. Here two pixels RGB values in the Fig.8 difference is less than or equal 10. So, the value for finding similar in Fig.9, pixel depends on the quality of the image. Then we apply big connected region for finding the black region which contain lip in binary image as in Fig.10. And we are sure that the big connected region is the lip because in the lip box, lip is the largest thing which is different than skin. Then we have to apply Bezier curve on the binary lip as in Fig.11. For apply Bezier curve, we find the starting and ending pixel of the lip in horizontal. Then we draw two tangents on upper lip from the starting and ending pixel and also find two points on the tangent which is not the part of the lip as in Fig.12. Finally the Bezier curve for the eye and lip is retrieved.

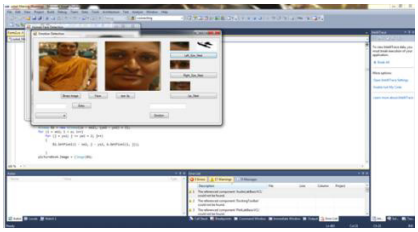

Fig. 7 WHITE & BLACK PIXEL OF LEFT EYE

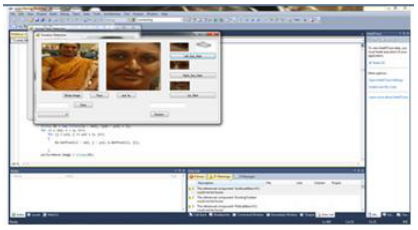

Fig. 8 BEZIER CURVE FOR LEFT EYE

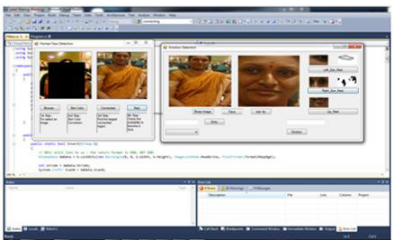

Fig. 9 WHITE & BLACK PIXEL OF RIGHT EYE

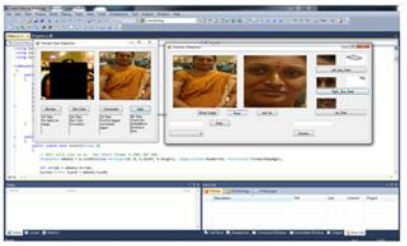

Fig. 10 BEZIER CURVE FOR RIGHT EYE

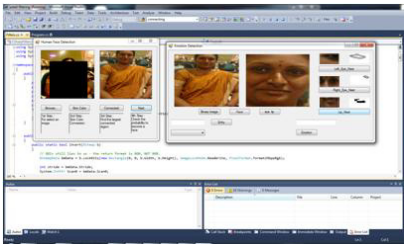

Fig. 11 WHITE & BLACK PIXEL OF LIP

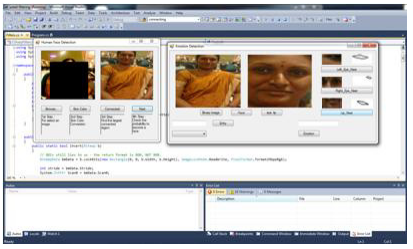

Fig. 12 BEZIER CURVE FOR RIGHT EYE

4.3.Database and Training

Two kinds of tables are present in our database. The first table is for "People" i.e storing all their names. Also for each person there are 4 kinds of emotions stored in the second table named Position. In the second table, for each index there are totally six points that control the Bezier curve for the lip and height. Hence with this flow the system developed learns the entire emotions of the people. With bezier curve of lip and eye we find the emotion. If the person's emotion information is available in the database, then the program will match which emotion's height is nearest the current height and the program will give the nearest emotion as output. Hence the emotion is detected as Smile in Fig.13.

Fig. 13 EMOTION DETECTED

5. CONCLUSION

We conclude that in this paper the proposed approach to the problem of employee's emotions are resolved by detecting their emotions using Bezier Curve. Hence by becoming more knowledgeable about how emotions affect the primary sources of competitive advantage, organizations can help their management team recognize the critical connection of employee's emotions and then try to make it right before it affects the productivity.

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