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# Feedback System Using IOT

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**Abstract:** ***To capture the live data from the camera using IOT device for facial expression detection using algorithmlike Harr-Classifier and SVM.***

**Keywords:** Facial expressions, face detection, Haarclassifier, SVM algorithm

## 1. Introduction

Emotional aspects have huge impact on communication. It is carried out in diverse way, and it may be verbal and Non-verbal. Voice (Audible) is a verbal form of communication and face expression, action, body posture and gesture are non Verbal form of communication .Social Intelligence like communication understanding, decision making also help in making behavior of humans

Human spend a large amount of their time interacting with computer one or more type, However computer are emotionally blind and indifferent to the state of users. Human interaction does not consider emotion, ignore whole channel of available information. Face contains large portion of expressive portion Behavior we use facial expression to display our emotional states.

Student gathered is a key point of contemporary education where it values its goal has own rights. We explore approaches for automatic recognition of gathered from student facial expression. We studied whether human observe can reliably judge from the gathered of student face. Machine learning plays vital role in image processing project for image capturing in form of frames are given as input. To algorithm when they classify images. There are various machine learning techniques to classify data.

### 1.1 Related Work

Identification of people are challenging problems which has bring more attention in these years due to its many application in different fields. Face emotion recognition is challenging problems and update to date, No such technique is available which can provide robust solution with fine accuracy to all situations.

Facial expression recognition application developed in this project is basically used student facial expression future process into facial detection. Facial expression widely used in image process application.

## 2. Literature Review

[1] Context local Aware and Local Binary Search

**Author:** Yueqi Duan, Jiwen Lu, Senior Member, IEEE, Jianjiang Feng, Member, IEEE, and Jie Zhou.

**Description:**
In this paper we have proposed context ware local binary feature learning method for face detection. Unlike existing learning local feature face descriptors such as discriminant face descriptors and binary face descriptor which learn each feature code individually, on CA-LBFL exploits the context information of adjacent bits by constraints the number of shifts from different binary bits, so that more tied information can be exploited for face representation.

[2] Real-time SVM based Emotion RecognitionAlgorithm

**Author:** Wout Swinkels1, Luc Claesen1, Feng Xiao2, and Haibin Shen2.

**Description:**
This algorithm extracts specific facial clues, in the form of moving ratios, and interprets these cues with a cascade of SVMs. In total there are 4 different steps to achieve the emotion detection. First, the countenance is detected with an adapted Histogram of Oriented Gradients algorithm. Subsequently, 19 feature points are derived from the facial region. The next step comprises the calculation of 12 moving ratios based on the distance between those feature points in successive frames. Finally, the moving ratios are used as feature vectors for a multi-class SVM in cascade with a binary SVM.

## 3. Proposed System

First the admin has to login successfully into the system for loading the images we use the feature extract algorithm after successfully loading the image it is preprocessed in the system for extraction of images. Here the noise reduction and Contrast Adjustment is applied in harr classifier during image upload. SVM is basically used of emotion detection and SVM testing is applied for prediction.

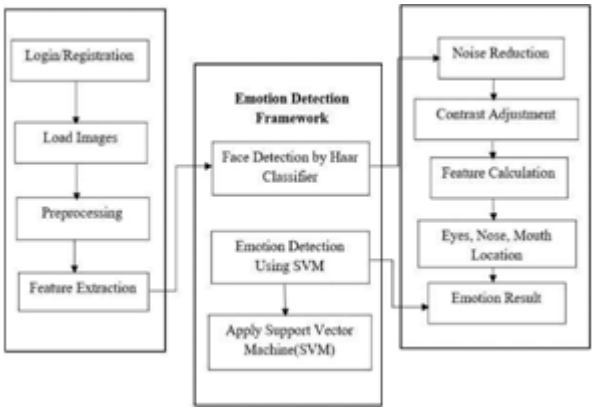


**Figure 1:** Proposed system

1) Frame Extraction / Live Camera: User grabs images using live camera on the application, the application then extracts frames from the video. These frames are saved on admin machine. Frames are usually in 640x480 formats.
2) Pre-Processing on images: Once we get the faces, we apply the pre-processing techniques on the images like sound removal, normalization etc.
   a) RGB to Gray Scale Image: Convert the image into a Gray scale image by taking the average of each pixel of RGB image.
   b) Image Normalization: Normalization is a process that changes the range of pixel intensity values to promote intensity distribution for the given images.
   c) Noise Removal: Removing errors in the image acquisition process that result in pixel values that do not reflect the true intensities of the real scene.
3) Face Detection: Apply the Haar-Cascade Classifier for the face detection inimages.
4) Feature Extraction: A SVM consists of an input and an output layer. SVM will classify the features on the basis of training dataset. It extracts the features of faces from the image like nose, lips, and eyes in the form of points asfollows:
   a) Eyebrow rises
   b) Upper eyelid to eyebrow distance
   c) Inter-eyebrow distance
   d) Upper eyelid
   e) Top lip thickness
   f) Lower lip thickness
   g) Mouth width
   h) Mouth Open

## 4. Algorithm

**a) Haar cascade Classifier for Face Detection**

Harr classifier is used for face detection when one of these features is found, the algorithm allow you to pass the next stage of detection. A face candidate is a rectangular section of original image called sub window. Generally sub windows has fixed size of 2424 pixel. This Sub-window is often scaled in order to obtained variety of different size faces. This algorithm scan entire image with this window and denotes each respective section a face candidate.

**b) Support Vector Classification Algorithm**

Support vector machine (SVM) proposed by Vladimir cortes the have successfully applied for gender classification problems by researcher. An SVM Classifier is linear classifier where separating hyper plane is chosen to minimized the expectation classifier Error of the unseen test pattern.

## 5. Results

**Figure 1:** Raspberry Pi 3

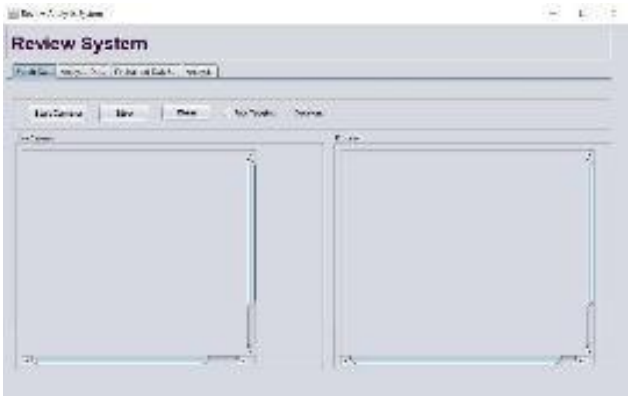


**Figure 2:** Main Window


**Figure 3:** Analysis


**Figure 4:** Result

## 6. Applications

a) Lecture Analysis through facial emotions.
b) Portability achieved through IoT device.

## 7. Conclusions

Thus we have developed application for education institute that can be used for generation for a particular lecture by detecting
The student gathered in a lecture and detect facial expression.

## References

[1] Dr Renny , Dr Neeta Tripathi, "Efficient Method of Face recognition and Emotion detecting", 2015 International Conference on Communication System.
[2] Xiang –Yu Li,Zhen-Xian Lin, Face Detection Based on fast PCA Algorithm.