# Event Management using Facial Recognition

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**Abstract -** *Facial recognition technology is a biometric software that mathematically stores an individual's countenance. This permits the technology to spot someone in live video or digital images with none other information. We are able to now use facial recognition technology to identify and register attendees at our events. Not only do self-check-in booths save our labor costs, the check-in is really safer. Long entry lines at events would be a thing of the past as facial recognition technology is integrated into the registration process. At the check in we will greet the attendees with their name. People's facial expression can convey and reflect their emotions, like happiness, excitement, surprise, sadness, and tedium. These expressions, called micro-expressions, are commonly utilized in marketing and by event marketers to know their audience. With the invention of facial recognition technology, micro-expressions in events are taken to the next level. Instead of waiting until the tip of your event to receive feedback, we are able to use facial recognition technology to achieve accurate, live feedback without bothering attendees. The automated facial recognition technology can measure people's micro expression, so we can evaluate if attendees or guest are enjoying event or not. With this data we are able to also make real-time changes to save our event from disengagement. Event planners will no longer have to wait for survey feedback to determine if an event was a successful or not. Instead, we can ensure our event's success in real-time.*

*Key Words*: **Facial recognition, Sentiment analysis, Machine learning, Python, OpenCV**

## 1. INTRODUCTION

The primary goal is to create efficient event management system which recognize face of the event attendee. Facial recognition technology may be accustomed to identify and register attendees at our event. This application will enhance event and attendee experience using AI, machine learning tools and can also provide real time feedback without bothering attendees and will not longer have to wait for the survey feedback to determine if an event was a success or not.

### 1.1 Definition of topic and explanation

Machine learning is a branch of artificial intelligence inspired by psychology and biology that deals with learning from a collection of data and can be applied to unravel wide spectrum of problems. A supervised machine learning model is given instances of information specific to a problem domain and an solution that solves the matter for every instance. When learning is complete, the model is ready not only to produce answers to the information it's learned on, but also, to yet unseen data with high precision.

Neural networks are learning models employed in machine learning. Their aim is to simulate the learning process that happens during a human neural system. Being one in every of the foremost powerful learning models, they're useful in automation of tasks where the choice of a human being takes too long, or is imprecise. A neural network will be in no time at delivering results and should detect connections between seen instances of information that human cannot see.

### 1.2 Aim and scope

To implement an efficient software for event management which will provide real time feedback and increases overall experiences of the attendees. In the real time changes to save our event from disengagement.

## 2. LITERATURE SURVEY

N. Sudhakar Reddy et.al [1] had implemented two features namely student attendance and feedback system has been implemented with a machine learning approach. The system automatically detects the scholar performance and maintain the student's record like attendance and their feedback on subject like Science, English etc. Therefore, the attendance of the scholar is made available by recognizing the face. As a result of the recognition, the scholar's attendance information and information about his or her grades is obtained as feedback.

E. Varadharajan et.al [2] proposed the system supported face detection and recognition algorithms, which is employed to automatically detects the coed face when he/she enters the class and the system is capable to marks the attendance by recognizing him/her. When it's compared to traditional attendance marking system, this method saves the time and also helps to observe the scholars.

Nandhini R et.al [3] in proposed system with the deep learning and machine learning technology, the machine detects the attendance of the scholar and maintain a record of those collected data. The collected data are stored in database which can be retrieve.

## 3. METHODOLOGY

### 3.1 Facial Recognition Algorithms

Item detection using Haar feature primarily based cascade classifiers is a powerful object detection technique. It is a machine learning primarily based method where function or model is trained from a variety of positive and negative images. It is then used to detect in other images.

Initially, the algorithm needs a lot of positive images to train the classifier. Then we need to extract features and precise characteristics from it. For this, Haar function shown in below picture are used. They much like our convolutional kernel. Each and every function is a single value achieve by subtracting sum of pixels beneath white rectangle from sum of pixels beneath black rectangle.
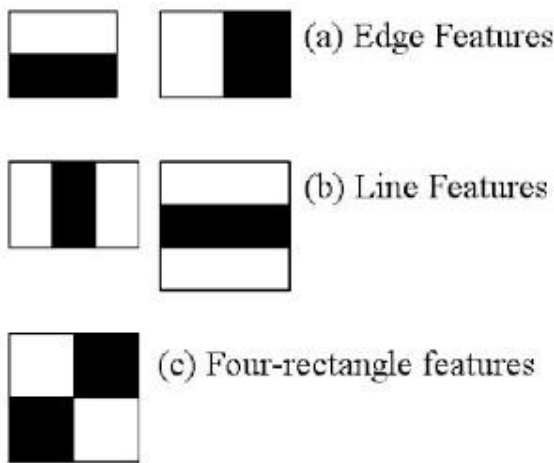


Fig : Different block representation

Now all feasible sizes and locations of each kernel is employed to calculate many features. (Even a 24x24 window results over 160000 features).For every feature calculation, we would like to search out sum of pixels under white and black rectangles. To unravel this, we introduced the integral images. It simplifies calculation of sum of pixels, how large could be the number of pixels, to an operation involving just four pixels. It makes things incredible rapid. Amongst of those features we calculated, most of them are beside the point or irrelevant.

The first feature selected seems to cognizance on the property that the place of the eyes is usually darker than the place of the nose and cheeks.

The second attribute chosen is based on the fact that the eyes are darker than the nose bridge. But the same window applying on cheeks or any other place is irrelevant.
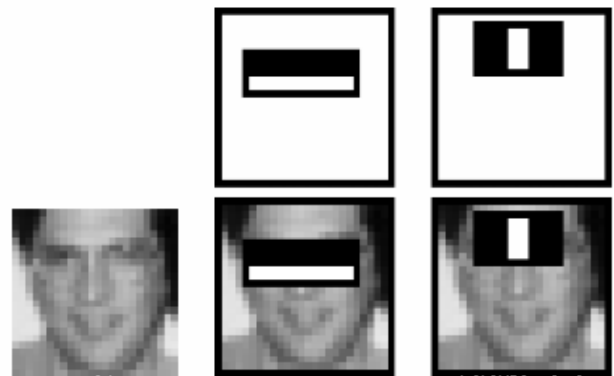


Fig : Block mapping on image

We do this by applying each function to all of the training pictures. It finds the best threshold for each function to identify the faces as positive or negative. But obviously, there will be errors or misclassifications. We choose features with the lowest error rate, which means they're the ones that better distinguish between face and non-face images. (The process is not as simple as this. Initially, each image is assigned the same weight. The weights of misclassified images are increased after each classification. Then again same process is done. New error rates are calculated ,also new weights. The procedure is repeated until the necessary precision or error rate is met, or until the required number of features is discovered).

A weighted sum of these poor classifiers makes up the final classifier. It's called weak because it can't identify the picture on its own, but when combined with others, it creates a strong classifier. Also 200 features, according to the report, provide 95 percent accuracy in detection. Around 6000 features were included in their final configuration.

The non-face area of an image makes up the majority of the image. As a result, using a simple method to verify whether a window is not a face region is a safer idea. If it isn't, toss it out in one take. It should not be processed again. Instead, concentrate on areas where a face may appear. This way, we'll have more time to explore a potential face field.

With the idea of a Cascade Of Classifiers to accomplish this. Rather than adding all 6000 features to a single window, divide them into different stages of classifiers and add them one by one. (In most cases, the first few stages would have a small number of features.) If a window fails the first inspection, it should be discarded. We don't care about the remaining features. Apply the second stage of functionality and continue the loop if it passes. A face region is a window that passes through all levels.

## 3.2  Sentiment Analysis

OpenCV has a few 'face reorganization' classes that we can also use for emotion recognition. Employed a variety of techniques; the Fisher Face begin the most common. Emotion detection, also known as facial expression classification, is a major topic in today's deep learning world. To classify emotions in real-time using just camera and some lines of code is actually a big step towards Advanced Human Computer interaction. It's clear that recognizing emotions is a difficult task, particularly when using only pictures. Even for humans this is difficult because the correct recognition of a facial emotion often depends on the context within which the emotion originates and is expressed.

## 3.3  Frontend / GUI

Deploying machine learning model is a key aspect of every machine learning project. The proposed system has two models, one for face recognition and other for sentiment analysis. These models will be connected to our web application.

   Image input will be sent to the server using POST request. The request will be the route to the python functions which will do all the computation work and will give the output. If the user is authenticated properly, his attendance will be marked in the database.

**Event Table**

- Id (e_id)
- Name (e_name)
- Start Date (e_start_date)
- End Date (e_end_date)
- Start Time (e_start_time)
- End Time (e_end_time)

**User Table**

- Id (u_id)
- Name (u_name)
- Email (u_email)
- Contact (u_contact)
- Registered Event ID (e_id)
- Status (u_status)
- Entry Time (u_entry_time)

Fig: Database table

## 4. CONCLUSIONS

 Thus, the aim of this technology is to capture the video or image of the attendees, convert it into frames, relate it with the database to ensure their presence or absence. Smart event management system is designed to solve the issues of existing manual systems. We have used facial recognition concept to mark the attendance of the attendees and make system better. The method works well in a variety of poses and combinations. The automated event management system helps in increasing the accuracy and speed ultimately achieve the high-precision with real-time feedback.

## 4.1 Limitations

- Facial recognition is constrained by poor image quality.
- The accuracy of facial recognition can be hampered by different face angles.
- Facial recognition technology can be limited by data processing and storage.

## 4.2 Scope for future development

- Integration of criminal record and social media account with our system.
- Sensor implementation for making facial recognition more efficient and faster.

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