

# Face Recognition for Monitoring Gamers Behaviour and Parent Alerting System

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## Abstract

With the development of technology, the use of Smartphones has increased a lot. People are getting more addicted to games. A system has to be developed to detect the gamer behaviour. This system identifies the face in a picture that is being provided to it as an input and finds the facial highlights in a picture. The discovery of the facial parts, for example, eyes, nose, mouth and face is a significant assignment in this procedure. Human face features are detected and recognized using this face recognition system. The major focus of the study is the calculation of Viola-Jones Cascade Object Detector which gives different mixes of filters and techniques to recognize these facial expressions for the input. With the use of this facial expression detection, behaviour of the gamer is continuously detected. If the gamer shows any abnormal behaviour, an alert is sent to the parents.

**Keywords:** Viola Jones Algorithm, Face detection, Alert system

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## 1. Introduction

Versatile games may offer cell phone clients a customized approach to appreciate life. The game could be an effective apparatus for conduct identification. Cell phones are perpetually making strides for applications not requiring rapid or huge memory. The presentation of the cell phones is persistently improving and a critical increment in the quantity of clients was watched. Douglas Gils trap, senior VP of Ericsson, expressed, "Desires for versatile system quality have been raised by the accessibility of cell phones and tablets that have changed the manner in which we utilize the Internet. Portability is turning into an undeniably noteworthy piece of our day by day lives; we generally include gadgets inside arm's span, enabling us moment access to data, amusement and social association." Recent examinations indicated that the utilization of cell phones in day by day life can encourage intuitiveness, improve mental responses, and support social communication.

Today, shrewd gadgets can perceive outward appearances. This capacity offers another chance to make

a scope of uses that would somehow be inconceivable. Acknowledgment of outward appearances has created as

of late gratitude to significant advances in related fields, especially in AI, picture preparing, and human acknowledgment. Therefore, the effect and the potential utilization of this innovation are increasingly more created in a wide scope of uses including human-PC communication, robot control, and the observing of the state of a driver (eg, vehicle, truck, and so forth.). In any case, until this point in time, the acknowledgment of outward appearances continuously is as yet a troublesome errand because of challenges in precisely separating the most helpful enthusiastic qualities.

Human outward appearances show the association among feeling and the reason behind the conduct of an individual. Outward appearances for the most part reflect feelings as a standard, adaptable and physiological reaction and could give proof of the psychological condition of an individual. A grin is the most open outward appearance that happens in individuals' regular day to day existence. It much of the time shows want, satisfaction and appreciation. Identifying grins can be

utilized to evaluate an individual's psychological state. Grin identification has numerous applications practically speaking, for example, intuitive frameworks (e.g., gaming), video remotely coordinating, UIs, and patients' wellbeing checking. For instance, the measurements mirroring the onlookers grins can illustrate, to a limited degree, "how much the group of spectators prefers" the interactive media content.

The issue with grin acknowledgment is outward appearance discovery. Serious take a shot at outward appearance acknowledgment has been completed.

## 2. Objective

Face Detection: The task of Face Detection is effectively made in the point of view of human visual errand however when it comes in the perspective on PC it becomes tad troublesome. A picture is provided to the system of face detection in which the behaviour is identified. It makes sure that the system takes care of the illumination, pose variety and lighting factors. The picture or the data that is provided to the system is normalized and illuminated; this depends on the face and the pattern of the image being provided. This available predefined data which is viable from the discovery of eye and commotion is performed utilizing face highlight extraction module. This is valuable in separating the countenances and the non-faces part regarding a few photometric and the geometric varieties. At last the provided output is used to recognize the facial expressions using parts, for example, mouth, eyes, and nose and chest area dependent on the features.

## 3. Existing System

The issue identified with outward appearance acknowledgment may change between a few factors, for example, illumination; pose variation and rotation, and so forth. There are numerous investigates dependent on the location of face and individuals following and including the quantity of people groups in either a picture or video. In any case, distinguishing facial parts in a few pictures is a difficult assignment as the precision won't be useful for each picture. The organization named 'Omran' is a detecting organization has discharged a grin estimation programming which recognizes the grin of a few people simultaneously with the level of 0-100. It utilizes 3D face mapping innovation and its recognition rate will be more prominent than 90%. Likewise, the outward appearances given by the people have been recorded and examined utilizing.

The calculation, for example, PCA, LDA has been utilized for the acknowledgment of face which gives decent outcomes. The FGNET face database have been utilized and the outcomes have a location pace of 88.5% and bogus alert pace of 12.04% while Sony T300 plays out the discovery pace of 72.7% and bogus caution pace of 0.5%. The passionate acknowledgment on the face has been accomplished with a best after effect of 94% using

Raspberry Pi II and the appearances that are invariant to the direction and posture have been recognized with the Gabor wavelet techniques.

## 4. Proposed System

Viola Jones algorithm discovered by Paula Viola and Michael Jones contains Haar cascade classifier. One of the most important classifier used for face recognition is the Haar Cascade classifier. The Haar features controls the nearness of the features in any of the info picture. Thus as a result of using Haar Cascade Classifier, each element is acquired by isolation. It isolates the total black pixels by the total of white pixels as appeared in the figure 3.1. Square like features appears on the face or the image that is being provided to the system, this helps in fast discovery of the faces.

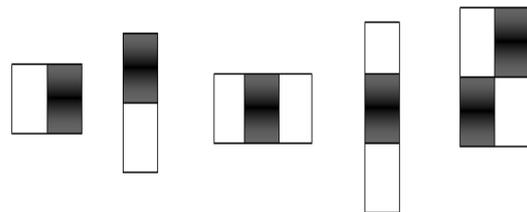


Figure 1: Haar Features

The Haar features have been permitted to convolve and look over the pictures from the upper left corner and it parts of the bargains face preparing at the correct base corner as in Fig. 3.2. So as to recognize the essences of the individual on the picture, a few times of examining has been finished utilizing the features that look like Haar features. In this system the idea of fundamental picture is utilized so as to figure the square shape like features. The four esteems present at each edge of some random square shape are utilized to resolve the aggregate of pixels present in any square. In an indispensable picture, the incentive at each pixel is given by the total of the left and to the above pixel of the picture. All the pixel esteems have been included square shape D as show in fig 3.2.

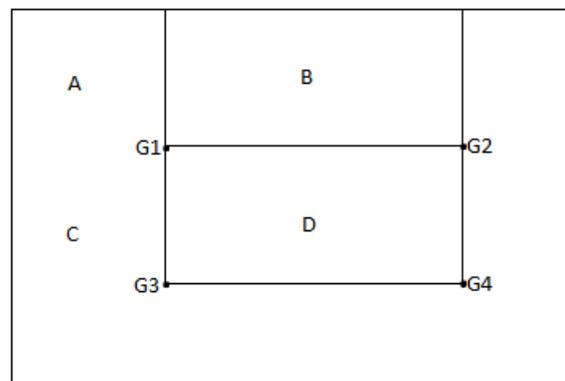


Figure 2: Calculation of Integral image

Initially a 24x24 window size was considered as the base size of the window. A 24x24 window size is used for deciding or assessing the features in the picture given. The different features like position, type and size of the Haar features whenever considered, at that point the estimation of 1,50,000 features ought to be done which is incomprehensible for all intents and purposes. The best features among these 1,50,000 features have been discovered utilizing Adaboost procedure which is a calculation for Artificial Intelligence. This might be considered as frail classifiers. Ada support decides a solid classifier which might be the direct blend of these frail classifiers.

Features obtained through the application of Haar Cascade classifier are known as Haar Features. This technique of extracting Haar features can be effectively utilized in detection of a face from the data that is provided to the system as shown in Fig 2. During this face detection technique, system may or may not find the face to detect the features such as face, mouth, nose and eyes for the data provided to the system, thus in such cases the system should return with a non face area.

## 5. Methodology

Three main concepts during the implementation of Viola Jones Algorithm for detection of face implementation are:

1. Rectangular shaped features across the face that shows the Haar like Features that are used for extracting features from the image or data being provided to the system.
2. Ada boost support is an AI technique for identifying the face. This Ada boosting utilizes any of the four boosting methods to boost a weak classifier and make it more effective.
3. A significant number of the features are consolidated using Cascade classifier proficiently.

In this manner subsequent to executing the calculation it must be coordinated with a ready framework. This ready framework ceaselessly identifies the conduct of the gamer and when the gamer shows any irregular conduct, an alarm must be sent to the guardians.

Thus after implementing the algorithm it has to be integrated with an alert system. This alert system continuously detects the behavior of the gamer and when the gamer shows any abnormal behavior, an alert has to be sent to the parents.

The activities of face recognition was utilizing Viola Jones, a plan of how face location functions utilizing the Viola-Jones algorithm from the earliest starting point of the discovery procedure to the consequences of the identification procedure. The main procedure was to peruse the example of the face picture of a picture or peruse the example of the face picture that was confronting the camera. From the picture that had been caught it would be done Haar features include perusing

by preparing the picture into boxes to get the distinction of edge estimation of the dull zones and splendid territories of the picture. On the off chance that the distinction between the dim and the splendid regions over the edge or limit esteem, at that point one might say that the component exists.

Further to decide if there were many Haar features on a picture and on an alternate scale productively utilized Integral Image. By and large, the joining includes little units at the same time. For this situation the little units were pixel esteems. The fundamental incentive for every pixel was the total of the considerable number of pixels start to finish. Beginning from the upper left to the base right, the whole picture could be added with different number activities per pixel. At that point to choose the particular Haar feature to be utilized and to set the limit esteem was utilized an AI technique called AdaBoost. AdaBoost consolidates numerous feeble classifiers to make an incredible classifier. By consolidating some AdaBoost classifiers as channel circuits that were productive enough to order the picture zone. Each filter was a different AdaBoost classifier that comprises of a frail classifier or a Haar filter. During the filter procedure, on the off chance that any of the filter neglect to pass a picture territory, at that point the zone was promptly classed as non face. In any case, when the filter passes a picture zone and goes through all filter forms in the filter circuit, the picture region was named the face. The following stage was cascade classifier. The request for channels on the cascade was controlled by the weight given AdaBoost. The biggest weighted filter was set in the main procedure, intending to delete the non-face picture zone as fast as could be allowed. The last stage was indicated the object of the example picture that has been identified face or not confront.

It involves a flow of process that include-

- a. Input Image/ Original image: Image or the video from the front cam is provided as input to the system.
- b. Face Detection: Detection of the face is done using the implementation of the algorithm that takes in image or video as input.
- c. Cropped image: Detected face is cropped to make the face visible for extracting the information like emotion.
- d. Feature Point Detection: Feature points like eyes, mouth and cheeks are detected and thye behavior is identified.
- e. Non face part removal: removing non-face parts like hair and ears. This makes the data extraction easier.
- f. Facial components Extraction: extraction the important and required components to detect the behavior or the mood of the input face being provided.
- g. Emotion Detection: detecting the emotion of the input face that has to be continuously monitored.

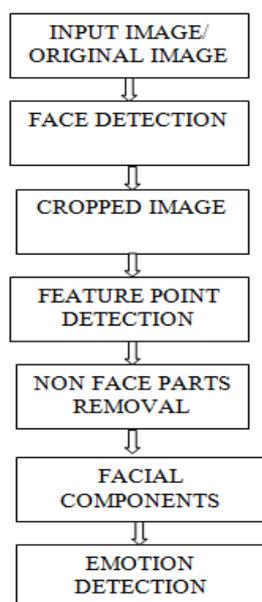


Figure 3: Architecture Diagram

## 6. Result

The test has been assessed on a few face pictures that were detected through the face cam of the system during the usage. The identified faces utilizing the calculation give a precision of 91%. At whatever point there is no face or picture gave to the calculation in the database, it begins the face cam to distinguish a face that contains straight face which isn't intricate or variation to identify the appearances on it. So the appearances with changing parameters in this database were taken and an acknowledgment and preparing of the classifier is finished. In the calculation we can recognize the different facial pieces of a human and some non-facial areas are evacuated utilizing edge systems.

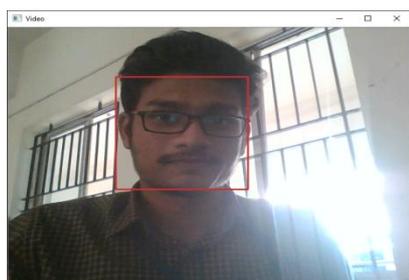


Figure 4: Face Detection System

When the system does not found a face or image even after starting the face cam, the system should return a not face area efficiently. The Haar like features are used to detect the facial parts. These features extracted from the facial parts are used to recognize the expression of the image of the data from the face cam. Thus the expression or the behavior of the user is continuously monitored using this system.

## 7. Conclusion

In this paper the face, eyes, nose and mouth of a human is recognized in an irregular arrangement of tests and further tried. These are described concerning checking the separation of the eyes and coordinating the understudy that aided in recognizing the left and right eye sets of the human, the nose with the darker locale at the 2 sides and the lighter district at the middle, mouth and the face with a few points on it. The calculation, as of now characterizes the separation between the two eyes when any picture is given as an info and afterward it forms the calculation and matches the eyes separation and understudy separation and in this way the eyes will be recognized. Thus a face detection system has been developed using Viola Jones algorithm's Haar Cascade classifier that extracts the features from the face or the image that is being provided to it. This system thus can be used to continuously monitoring the behavior of the user.

Future scope of the project would be to implement this algorithm in an android device to detect the gamers behavior. Continuous behavior of the gamer playing a game on the android device is monitored. If the player shows any abnormal behavior, the system should alert the parents.

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