EMOTION DETECTION WITH DEEP LEARNING AND OPEN CV BASED VEHICLE AUTOMATION FOR SELF DRIVING CARS

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ABSTRACT-In this current world people prefer vehicle as a main mode of transportation. Due to overrated usage of vehicles people have been facing more inconvenience nowadays. Road accidents are the most frequentand avoidable incidents to happen to a road user. To prevent from these kinds of consequences we indented to use emotion detection as our primary aim, generally, the technology works best if it uses multiplain context. The execution of the output from the classifier will have a time change in function and it is also helps out to measure the dynamics of the facial expressions. We proposed the concept of image processing for the detection of face which is based on color image processing and analyzing using deep learning, Deep Learning and super resolution for robust face detection. A previous research on this emotion detection system is mainly based on collection of images and videos which is stored in data base which can be used in security system. Our ultimate air of our project is to provide a technology oriented, time saving and multimedia applications for the users to have safe and pleasant drive.

Keywords –Deep learning, emotion recognition, Biometric, Surveillance camera, Multimedia application.

INTRODUCTION- In day-to-day life communication plays a predominant role, it is the act of conveying emotions from one entity or group to another through verbal and non-verbal communication. It also develops the human and machine interaction with development in methods of telecommunication, computing, digital image processing which plays a major role in current generation, and its helps identify/sense face detection such as happy, angry, surprised and neutral mood using deep learning. It involves in the process of frame separation, pre-processing, feature extraction. In this case we used a CNN classifier to classified the acquired image into different emotion categories. We using Haar cascade and Haar classifier as our algorithm.

Previous researches on face detection involve a great significance in the processing of image and video that can be accessed in the database for the security purposes. In that case biometric validation is used for the detection on individuals in group that are under closed observation. Face detection plays a major role in biometric and it is appealing for a number of applications relating to visual recognition process .But the main disadvantage of the biometric systems is that the environment and usage can affect measurements and requires integration for additional purposes.

PROPOSED SYSTEM- In order to detect the facial expression which are stored in database in the form of digital image or audio reference from a source. The system uses a combination of technique such as face detection and recognition. Initially the process starts with image pre-processing where it refers to all the transformations on the data before its execution and it also helps to increase the accuracy and advanced color shape processing and technology. Secondly the color based facial image processing uses an algorithm with a sample image and different illumination from database, of pre-processing of the face images to obtain a segmented face from the input face image and it also helps in the case of De-blurring and super resolution for robust face detection/recognition. The Algorithm mainly consists of Haar Cascade which is machine learning object detection which is used to identify the images or a video. In contains four stages namely such as (i) Haar feature selection (ii) Creating internal images (iii) Adaboost training (iv) Cascading classifiers and it is also used to detect faces and body parts in an image.

HAAR CASCADE CLASSIFER :

It mainly consists of a group of stages, where each is an ensemble of learners. Haar cascade classifier is generally used to detect the object for which it has been trained for, from the input core. It is basically done by superimposing a image which is positive over a series of negative images. The training starts with a server and goes on with several stages. By giving high quality or high definition images, good results can be obtained and the stages of image classification is trained. First, we need to gather negative images. A negative image is actually not a replica of the original image for which the haar cascade is done. Secondly, we need to have one positive image, the object which the haar cascade will detect. The Haar Cascade is generally trained based on the server. Once we have your server ready to go, we will want to get the actual open cv library

SOFTWARE INTEGRATION:

Python is one of the high level interpreted programming language where used in wide range applications such as Graphical User Interface (GUI). The main deal of the information is provided by Python Tkinter Guide. The Tkinter is generally a package which is also known as TK interface commonly used as TKGUI Toolkit for the Python interface. In our project, We use Python as our Primary Programming Language for reducing the time consumption. Deep learning is used as a major domain for our program for getting the analysis of an image the information is processed and the database is applied to the field which uses a algorithm to extract the image and stored in a database server. BPA server is used to get the IP address of our domain. In previous cases, many used C / C++ as their main source which takes *n* number of lines to executed the output. To reduce these kinds of complexity we have replaced it with Python. Open CV is also our main source of domain which is mainly used for digital image processing.

BLOCK DIAGRAM

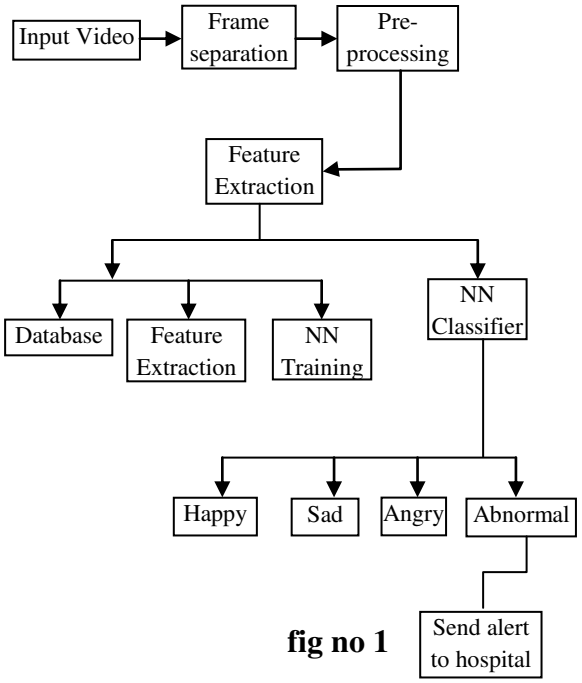

fig no 1

The block diagram shown above clearly explains about the operation of emotion detection through the facial images. This process initiates by capturing and recording of the facial images gets separated and aligned for the process before preprocessing where every image gets separated and aligned for the further processes. In the pre-processing unit the images get in to feature extraction are allowed to save in the databases for future use. The output of the images gets passed in to NN classifier where the output of the images will be shown as happy, sad, anger, etc. The abnormal conditions of the people will leads to send an alert message to nearby hospital.

WORK FLOW

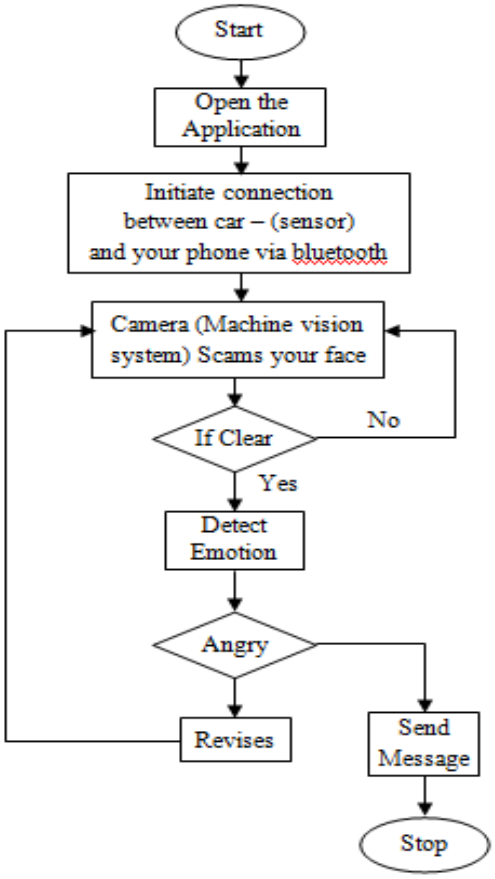

fig no 2

The flow chart shown above is the process in which starts with the opening of the required applications. This initiates a connection between the sensor located in he car and the mobile phone through bluetooth. The camera machine vision system scans the face and tries to detect any emotion. If it senses any abnormal condition then it sends a message. If it does not sense any emotion, then no process takes place.

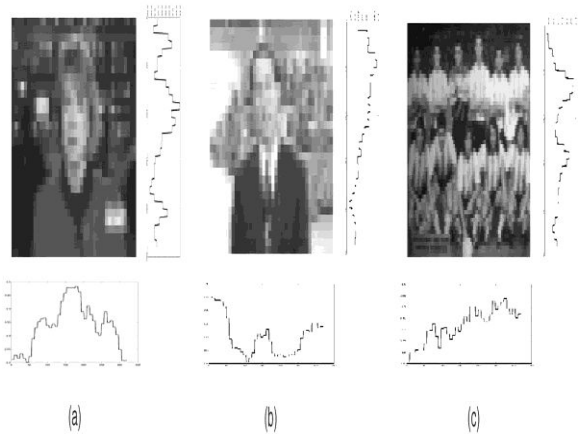

fig no . 3

In fig 3,there are two graphs which show the horizontaland vertical profiles of the obtained image.The face can be detected by looking for peaks in the graph of the horizontal and vertical profiles.But this method is found dificult to detect in the 2nd and 3rd image.

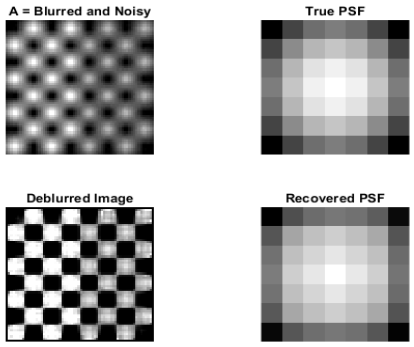

fig no . 4

In fig 4, the top image shows a blurred and noisy image which contributes to true psf. The second

image shows a deblurred image which will hence recover the image.

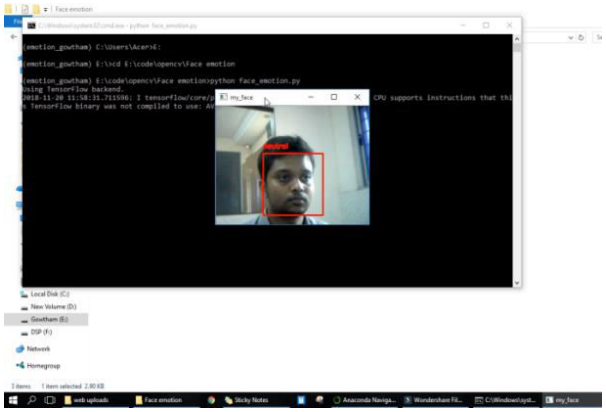

fig no . 5

In fig 5 the system can detect no emotion from the driver, therefore no process takes place and it remains stationary.

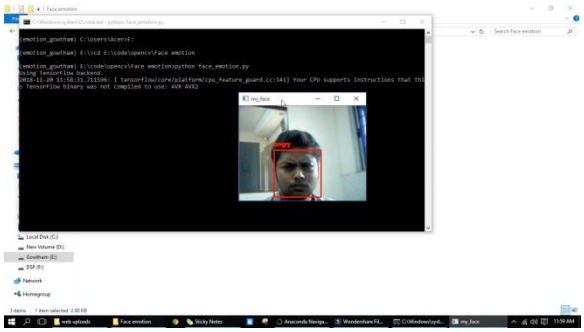

fig no. 6

In fig 6 the system is able to detect the emotion anger from the user;this immediately sends a message to the required destination.

FUTURE VISION:

The role of emotion detection in driving vehicles is brought out in the hopes of reducing accidents and collisions. In the future of emotion recognition, it can be widely used by the government in subsiding terrorist attacks by improving security systems. Face recognition is a huge part in biometric systems and has a wide range of applications in the surveillance and security systems. Many technology companies and consumer-research companies invest in emotion recognition for identifying a person's mood based on a variety of signals including facial expression. Use of such biometrics and emotion recognition helps the company to generate high engagement rates with their customers. It empowers the company to interpret how the customers connect with their product and advertising. It also shows how certain emotions and feelings can affect or determine the popularity of the brand and the eagerness to purchase it. Emotion recognition can also be used in machines which aid as instructors, helpers, lie detectors, music players etc.

CONCLUSION:

Emotion recognition finds most of its applications in real time scenarios where human emotions must be recognized in real time. Emotion detection from images is highly efficient, but its applications in real time are limited. The major issue in facial recognition is finding or discovering certain objects such as glasses, facial hair, etc., . At present, none of the 3D models developed can deal with occlusions. Results obtained surpassed human performance and show pose-invariant performance. It also shows reliable facial expression recognition in spite of changing light conditions as varying lighting can tamper with the process.

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