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Women Safety System Using Emotional VGGNet

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Abstract: ***In today's world women safety is one of the most important issues to be addressed in our country. When a women needs urgent help at the time of harassment or molestation, proper reachability is not present for them. Apart from being aware about the significance of women's safety, it is essential that they are provided with protection during those crucial times. The earlier existing system are helpful in detecting the women's location after the crime has been committed. In this project we will be using the women's handbag in which we will be fixing camera lenses and which will be carried anywhere they go. Whenever she comes in contact with any person outside, an image of that person is taken and the activities of the person can be monitored continuously. If the person behaves normally the image can be of no use and can be deleted. But if the activities of the person varies resulting in any harmful action then our system will detect it and process the captured image and it will send to the police and family members with GPS location tracked from IP address. Thus our project helps in saving the life of a women and safeguarding her in the present situation.***

Keywords- ***Deep Learning, Deep Neural Network, Emotion Prediction.***

I. INTRODUCTION

During recent times, the security of women in India has been due to some constant crimes against women. Women in present day India are joining workplaces such as President, Speaker of Lok Sabha, Union Ministers, Leader of Opposition, Chief Minister, Governor, and so on. However, they are being harrassed at the back of curtain.

Indian women are facing various issues namely sexual harassment, violent victimization through rape, acid attack, dowry deaths, forced prostitution, and many more. According to the statistics of 2015, it has been found out that women's (over 15 years or above) literacy rate is 60.6% while male literacy rate is 81.3%.

In order to address the above-mentioned issues, we have proposed a system based on Deep Learning algorithm that automatically captures the human emotions of the opponent and sends an alert message to the specified mobile number with longitude and latitude details.

II. RELATED WORKS

The following shows survey on emotion prediction. The most popular of the existing techniques used for emotion prediction. Here, we present a detailed summary of the related papers done by significant researchers.

A. Context Based Emotion Recognition using EMOTIC Dataset

We can find several recent works showing how emotions can be inferred from cues like text, voice, or visual information. The automatic recognition of emotions has a lot of applications in environments where machines need to interact or monitor humans. For instance, automatic tutors in an online learning platform would provide better feedback to a student according to her level of motivation or frustration. Also, a car with the capacity of assisting a driver can intervene or give an alarm if it detects the driver is tired or nervous. They present EMOTIC, a dataset of images of people in natural and different situations annotated with their apparent emotion. The EMOTIC database combines two distinct sorts of emotions (1) a set of 26 discrete categories, and (2) the continuous dimensions Valence, Arousal, and Dominance. We also present a detailed statistical and algorithmic analysis of the dataset along with annotators' agreement analysis. Through EMOTIC database, we train various CNN models for emotional acknowledgment.

B. Reliable Crowd sourcing and Deep Locality-Preserving Learning for Unconstrained Facial Expression Recognition

Automatic facial expression recognition has made significant progress in the past two decades. On the other hand, a massive amount of images from different events and social gatherings in unconstrained environments have been captured by users from real world. The design of systems capable of understanding the community perception of emotional attributes and affective displays from social images is receiving increasing interest. Fortunately, the emerging deep learning techniques have advanced unconstrained expression recognition to a new state-of-the-art. They present a Real-world Facial Database, which contains approximately 20,000 facial images with actions from thousands of diverse ages and races. During the crowd sourcing annotation, each image is independently labeled by approximately 40 annotators. The Expectation-Maximization (EM) algorithm is developed to reliably estimate the emotion labels to express mixed emotions. A cross-database study between RAF-DB and CK+ database further indicates that the action units (AUs) of real-world emotions are much more diverse than, or even deviate from, those of laboratory-controlled emotions. hypothesis. To address the recognition of multi-modal expressions, we propose a new Deep Locality-Preserving Convolutional Neural Network (DLP-CNN) method that aims to enhance the power of deep features by preserving the locality closeness while maximizing the inter-class scatter.

C. Measurement and Analysis of Local Pulse Transit Time for Emotion Recognition

The automatic detection and classification of emotions of individuals is investigated in the research field of affective computing. Various signals are used to derive data that are related to emotional states. In order to achieve data acquisition, one could distinguish between stationary and non-stationary systems. Stationary systems could analyze facial expressions or the speech of individuals through installed cameras and microphones in a room. Non-stationary systems could analyze physiological parameters through wearable sensor systems. However, smartphones and smart watches camera- and microphone-based systems can also be non-stationary. Additionally, physiological parameters can be acquired wireless from stationary systems. A method for PTT measurement can be developed using two PhotoPlethysmoGraphy (PPG) sensors. However, this method is erroneous . We present an algorithm that is capable to handle the derived physiological effects. The algorithm analyzes and compares the two PPG-signals to adapt to time-varying physiological effects. By using this algorithm, calculating and analyzing the local PTT for emotion recognition becomes possible. A study ($n = 40$) was conducted to test the algorithm and investigate the usefulness of local PTT analysis for emotion recognition. PTT-based parameters, which were derived from the frequency domain of the signal, showed a major ($p < 0.05$) difference between induced emotional states. Our findings indicate that parameters derived by our method are significantly affected by emotional stimuli. We suggest that this method can be used to advance emotion recognition investigations in real life as it can potentially be integrated into a single wearable device.

D. Temporal Segmentation and Labeling for Audio-Visual Emotion Recognition

Emotion is a central part of human communication that has a large influence on the overall quality and outcome of interactions. Human-centered and affective technology can benefit from automatic emotion recognition, because extracted affective information can be used to measure, transmit, and intuit user needs. However, developing such systems is challenging since emotional expressions are complex and dynamic, particularly in terms of the mixed factors of modulation that arise when a person speaks. To overcome this challenge, the presented study focuses on how speech alters the dynamics of different facial regions during emotion expressions, and how this information can be used to design and develop a new audiovisual emotion recognition system. The proposal of the Informed Segmentation and Labeling Approach (ISLA) uses speech signals that alters the dynamics of the lower and upper face regions. We demonstrate how pitch can be used to improve the probabilities of emotion from the upper face, and how this estimate can be combined with emotions from the lower face in a multimodal classification system**.**

III. METHODOLOGY

In this proposed system we focus on detecting the facial emotions with the help of deep learning algorithm called Emotional VGGNet.

A. Dataset Collection

There are three sources available for collecting image data. They are Scraping from the web, third party , pre trained networks. In our project , we have collected data set from scraping from the web.

B. Data Preprocessing and Augmentation

There are a number of preprocessing steps for a Deep Learning Project.

1) Uniform Aspect Ratio: In order to ensure that all the images have the same size and ratio, each image needs to be checked if it is a square or not, and cropped appropriately. This is achieved by cropping the images and focussing on the center part of the picture. After sampling a few pictures randomly, we can infer that all the images have uniform dimensions which simplifies the process.

2) Data Augmentation: Data augmentation is a technique to artificially create new training data from existing training data. Modern Deep Learning Algorithms such as the Convolutional Neural Network (CNN) learn features that are invariant to their location in the image.

C. Training the Model with Algorithm

The process of training an Deep Learning model involves providing a Deep Learning algorithm (that is, the learning algorithm) with training data to learn from. The training data must contain the correct answer called target or target attribute. The learning algorithm finds patterns in the training data that map the input data attributes to the target (the answer that you want to predict), and it outputs a Deep Learning model that captures these patterns. In this we will be using Emotional VGGNet algorithm to implement the model and getting the prediction of the model.

D. SMS API Integration

A SMS API is a software interface which enables the program to send short messages via a SMS Gateway. We will be using textlocal SMS API for our integration which enables us to easily integrate our SMS services with your website, software or CRM application in PHP, ASP, .NET, Java or any other language. The integrated solution of TextLocal and Optimove makes it easy to plan and send text messages, based on the customer segmentation.

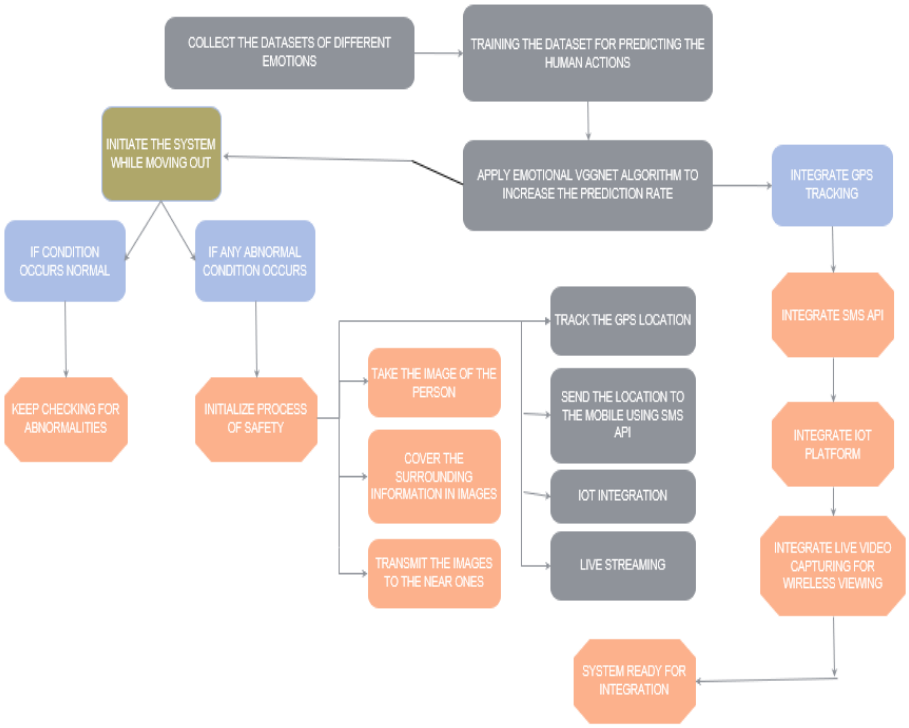

Fig.1 Architecture Diagram

IV. IMPLEMENTATION AND RESULTS

The working of the total model from the above diagram can be explained as follows. The dataset that is been required for the project training is been collected from various sources which is then trained by a deep learning model. After the training process, the Emotional VGGNet algorithm is been implemented to increase the accuracy of prediction and come up with a perfect emotion prediction. If necessary network surgery will also be performed where the combination of algorithms takes place to increase the accuracy. There will be integration of the GPS for detecting the actual location of the person to save them whenever required. We will also integrate SMS API for automatically sending the message to the care taker as well as the police to save the victim on time. An IoT integration is also performed to have a live streaming of the surrounding so that we can have an idea of what situation the victim is. As it is ready the person going out can switch on the device which will keep track of the opposite persons emotions of abnormality. As soon as the system detects the abnormal emotions of the opposite person such as anger, it automatically takes sends the location of the person to the care taker and police and also enables live streaming which can provide the actual condition of the person so that it will become easy to save the victim on time.

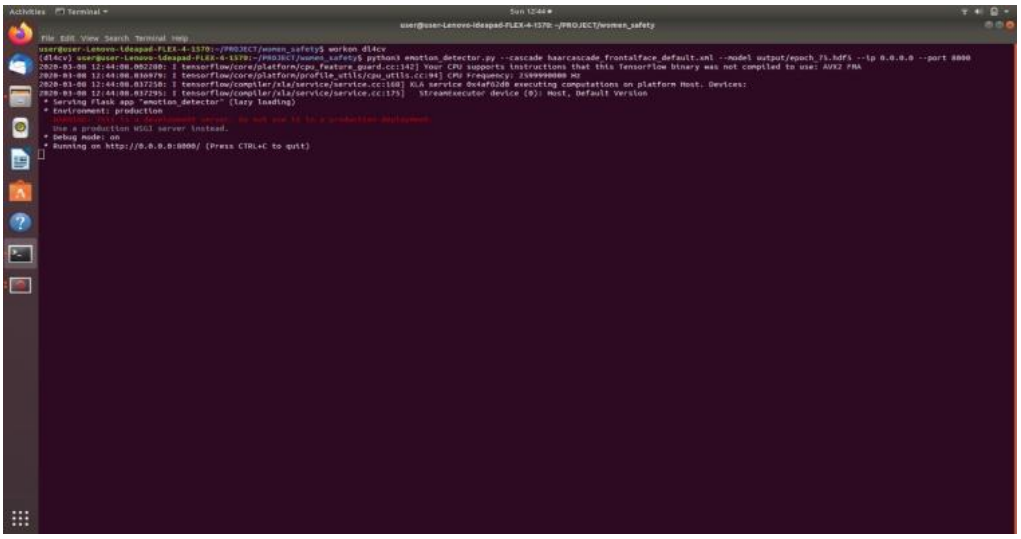

Fig.2 Execution Initialization

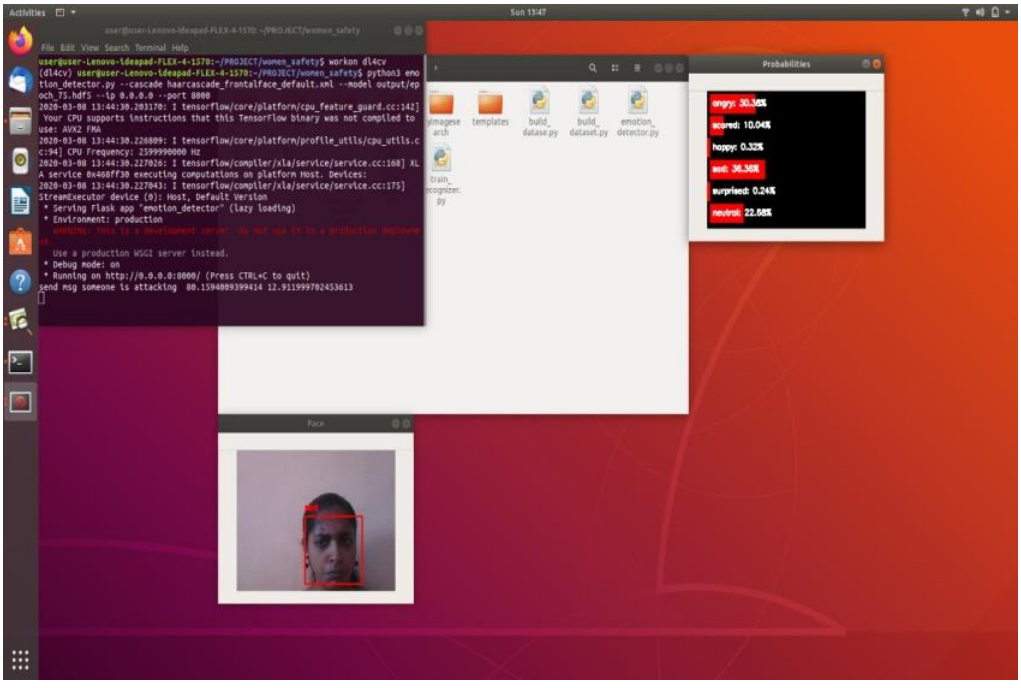

Fig. 3 Frame Display with Emotions

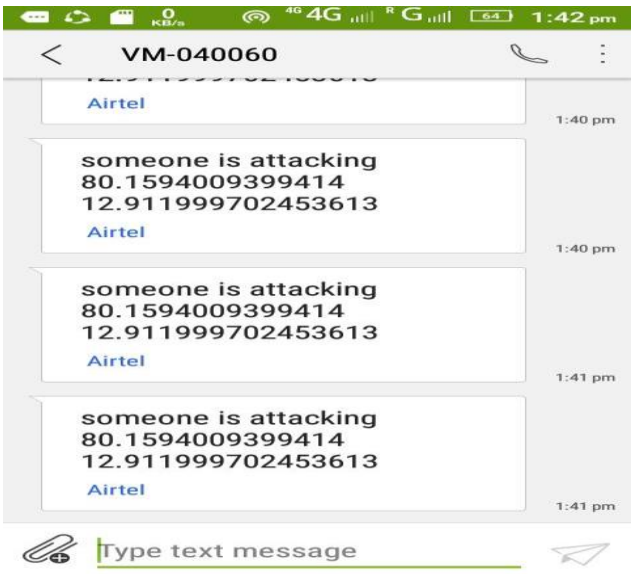

Fig 4. Alert Message

V. CONCLUSION & FUTURE ENHANCEMENT

This project is used for safeguarding the women which can automatically recognize the human emotions using the currently prevailing deep learning approach. This also helps in women's life like live streaming the face using cameras and sending the data to the police and family during abnormal situation. So, reduces the criminal activity and eliminates the mishaps with women by this project.

In the coming future, we review the application of the women safety technology in the safety field and it can promote for advance women safety technology with more accuracy. In this field they are more chance to develop or convert this project in many ways. Thus this project has an efficient scope in coming future where this idea can be converted to computerized production in a cheap way.

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