

Women Safety System using Internet of Things (IoT)

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Abstract- In today's world, women come across many situations that make them feel unsafe. 66% percent of women has reported sexual harassment in the year 2010 in Delhi. In such situations, the aid of a safety device that will inform the victim's family members or the authorities (in severe situations) may help women feel safer, confident and reduce the chances of harassment. An advanced system can be built that can capture the video of the event as well as send the emergency SMS messages of the victim to respective mobile numbers. The idea to develop a smart system for women is completely comfortable and also easy to use as compared to existing women security solutions such as infamous mobile apps, bulky belts and a separate garment that are just very abstract and obsolete.

Keywords- Video, SMS, Victim, Mobile

I. INTRODUCTION

Women safety is one of the major issues in today's world. The world is becoming much unsafe for women. In today's world, most of the women are stepping out at any time from their house for working. Even though many technologies have been introduced for women still kidnapping, eve teasing and sexual harassment are taking place in our country. In last few years crime against women has increased to a greater extent. Women are harassed not only in the evening or night but also during day hours at home, working place, shopping etc. There is number of women's who have been afraid of strangers for their safety. Around 80% of the women in our country have fear regarding their safety. We are focusing on building an effective, fast and reliant system to make the women of INDIA feel safe and empowered.

II. LITERATURE SURVEY

B.Vijayalakshmi in [1] proposed a scheme to improve the women safety by using GPS and GSM model. A small device with a buzzer and microcontroller is designed, and it can be placed on band or watch. When any insecure situation, the woman can make use of this device to send alert SMS by pressing this buzzer to predefined numbers (5 members). But this scheme cannot generate automatic alert SMS. Instead, it requires the human interaction during a panic situation.

Mr.Amar Saraswat in [2] proposed a model to sense the heart beat and body temperature using Arduino. LM35 is used for the sensing the body temperature which is a basic parameter for monitoring and diagnosing human health.

Heart beat sensor was used for sensing heart rate. This device will allow one to measure their mean arterial pressure (MAP) in about one minute and the accurate body temperature will be displayed on the Android. Though the system can be used to measure physiological parameters, such as Heart rate (Systolic and Diastolic), Pulse rate. It is not possible for a doctor to observe a patient's heart rate per minute and body temperature all the time.

In paper [3] such device is designed which is a portable one which can be activated as per the requirement of the individual which will locate the victim using GPS and with the help of GSM emergency messages can be sent to the respective locations as per the design. The gadget provides an alarm system, call for help, and electric shock to get rid of the attacker.

III. PROPOSED SYSTEM

The Proposed system is a security system which is specifically designed for women in distress. This system can be implemented as a normal surveillance system that can record live videos and is stored in the computer's hard disk. These videos recorded are converted to image frames by using the cv2 library in python. These images are classified as attack or normal by using the two machine learning techniques ie. training and testing. When an attack is detected the live video on monitor displays the text "Attack" and if no attacks are detected it displays the text "Normal ".In addition to this when an attack is detected ,an alert message is generated by using the SMS API to the concerned authorities mobile number.



Fig.1. Functional block diagram of proposed system

Working of this proposed system can be explained under two major domains:

1. Training
2. Testing

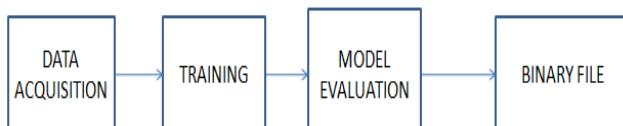


Fig.2. Training of system

In the Training section first data acquisition process is carried out ,that is digitizing data from the world around us so it can be displayed ,analyzed and stored in a computer. Here the videos are collected as data and they are converted into frames by using preprocessing method, these images are converted to grayscale. Training is done using the convolution neural network(CNN). The process of training model providing an ML algorithm, that is the learning algorithm with training data to learn from. So here we use the inception v3 algorithm for the same, in this step we will use our data to incrementally improve our model's ability to predict whether a given gesture is an attack or not. Here we train the system with positive and negative datasets, ie images. Positive in the sense that video shows an attack and negative in the sense that videos does not show an attack. After training the model, model evaluation is done in order to check the accuracy of the model and then the datasets are saved as a binary file. Methods for evaluating a model performance are divided into two categories : namely, Holdout and cross-validation. Both methods are used to test set (that is data not seen by the model) to evaluate model performance. It is not recommended to use the data we used to build the model to evaluate it. This is because our model will simply remember the whole training set, and will therefore always predict the correct label for any point in the training set. This is known as overfitting.

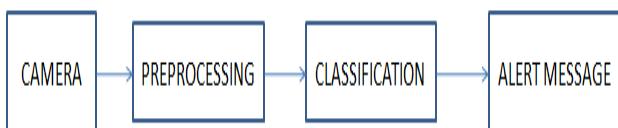


Fig.3. Testing of system

Similarly in the Testing section, first the camera records and monitors the live videos and this videos are converted to frames and then to grayscale by using preprocessing. Preprocessing is a common name for operations with images at the lowest level of abstraction both input and

output are intensity images. The aim of preprocessing is an improvement of image data that suppresses unwanted distortions or enhances some image features important for further processing. Here we convert the RGB image into gray scale. When we convert an RGB image into gray scale we discard lots of information which are not required for processing. Next step is classification. It is the process of assigning input vectors to one of the k discrete classes. The classes are mutually exclusive to make sure that each input values belongs to only one class.

Classes can be represented as areas or volumes in vector space known as decision regions. The boundary between different classes or decision regions is termed as decision boundary. There will be two classes for classifying this images:

1. POSITIVE CLASS(images that shows attack)
2. NEGATIVE CLASS(images that doesn't show attack)

It is the problem of identifying to which of a set of categories(subpopulations), a new observation belongs to, on the basis of a training set of data containing observations and whose categories membership is known and finally if the input data belongs to the positive class then the attack is being detected and correspondingly an alert message is being generated.

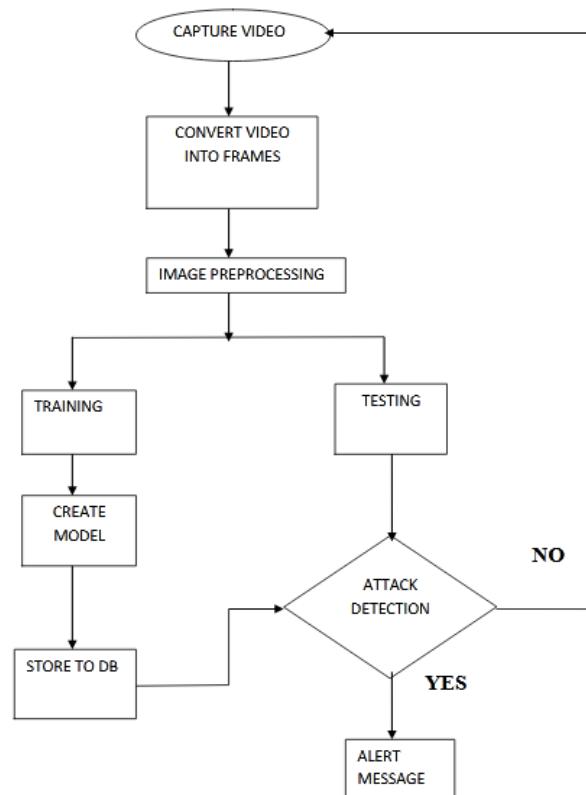


Fig.4. Flowchart of the proposed system

- Captures the live videos using the camera.
- Convert the videos to image frames.
- Image frames are converted to gray scale by using image pre-processing.

- This pre-processed data's are first gone for training.
- Creation of a model takes place and is stored on to the database and is used for attack detection.
- Next, pre-processed data's are gone for testing.
- If an attack is detected, then result is generated and as a result of this notification is being sent to the concerned authorities or relatives contact numbers.

IV. RESULT AND DISCUSSION



Fig.5. Image showing the output of the system when no attacks are detected



Fig.6. Image showing the output of the system when any kinds of attacks are detected

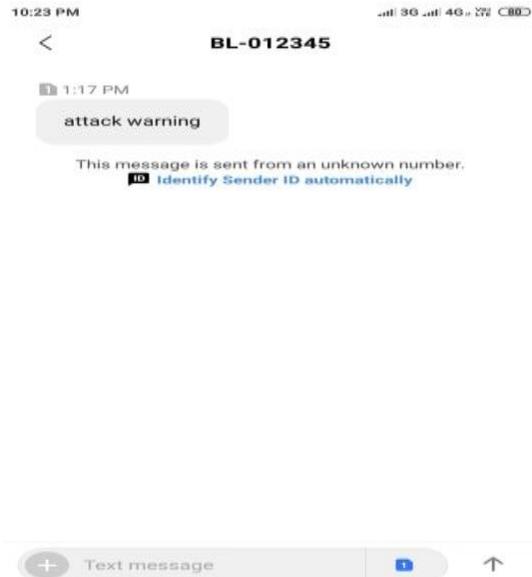


Fig.7. Image showing the SMS generated using SMS API when an attack is detected and is sent to concerned authorities phone number.

- Here if no attack are detected the system shows in the video footage as "Normal".
- When any attacks are detected the video footage shows "Attack".
- Here the score value shows how were the system predicts an attack has occurred.
- The value or scores that are created can represent predictions of future values but they might also represent a likely category or outcome.

V. FUTURE ENHANCEMENT AND CONCLUSION

We are focusing on building an effective, fast and reliant system to make the women of INDIA feel safe and empowered. This type of an idea being the first of its kind plays a crucial role towards ensuring women safety in the fastest way possible automatically. With further research and innovation, this project can be implemented in different areas at security and surveillance. This system can perform the real time monitoring of desired area and detect the violence with a good accuracy.

- It can be implemented as a CCTV network.
- It does not require any initiation by the victim.
- The recorded videos can be used as an evidence for further legal procedures.
- Does not require a monitoring person.

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