AI Based Surveillance Bot For Monitoring System

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Abstract- *AI based surveillance bot is a monitoring system built with Artificial intelligence used to send the instant notification based on the person's face detected Infront of the camera. The problem of household people can be solved using this device which has a camera with an onboard processor with WiFi-connectivity that can be controlled with the mobile device. This device sends a live feed of the device to an android mobile and sends an alert with an image of an unknown person.Our system is a detachable device that comes with an android app. It helps in continuous monitoring which has face detection and recognition algorithm incorporated in it.so it regularly monitors the house and recognizes the entry and exit of people coming.it saves the log of that particular person and automatically sends an instant alert notification to the app.*

Keywords- Monitoring, logs ,android app, alerts, Artificial intelligence, camera, face recognition, Mobile device, algorithm, live feed.

I. INTRODUCTION

In India, the population is rapidly increasing every day and more than 402 million people are going for their regular work. Those people need to take care of their homes when they leave.The household people and elderly people are prone to crimes such as theft, burglary, abuse, violence, some accidental falls, and even murder when they are left alone at their home. Reports say that these crimes are due to a lack of security in their surroundings.The are some solutions available to address this problem, like through mobile phones they are able to communicate their wards to be intimate about the problem but not every person is good at using mobile phones. Also, there are some existing solutions, like CCTV's are used to monitor our house but there is no live intimation, the installation and maintenance cost is high. Our solution will help the household and elderly people to feel free from their risk when they leave their home. With the help of the currently available technology like image processing, Computer vision and Artificial intelligence, we have developed a system to continuously monitor the people through a mobile phone and providing the custom alert notification to the user whenever there is an intruder inside the home, by   using Artificial intelligence to identify and recognize the face of the person

who is coming in. This will be an efficient solution to continuously monitor the households.

II. SCOPE OF THE STUDY

The scope of the project is to design a surveillance monitoring system using computer vision and artificial intelligence will enable the user to continuously monitor their surroundings and their wards from anywhere they need. The system will provide live streaming to their mobile phones to have 24/7 continuous monitoring and also alert notification to their email or mobile number based on the person who is detected in front of the camera. The user is able to see the logs of the visited person through their mobile phone along with the name of the detected person, time and date.

III. EXISTING SYSTEM

There are some solutions available to address this problem, like through mobile phones they are able to communicate their wards to be intimate about the problem but not every person is good at using mobile phones. Also, there are some existing solutions, like CCTV's are used to monitor our house but there is no live intimation of happening things on time, the installation and maintenance cost is high.

The existing system are as follows:

- CCTV's
- Alarm system
- Caretaker

Disadvantages Of The Existing Product:

- High Cost.
- The cost of the cloud is very high.
- One of the major disadvantages is that it can limit only to a particular area.

IV. PROPOSED SYSTEM

The problem of household people can be solved using this device which has a camera with an onboard processor with Wi-Fi-connectivity that can be controlled with the mobile device. This device can help wards to take care of

their houses and make household people lead their lives free from fear with the given features. This device sends a live feed of the device where it is kept to an android mobile and sends an alert with an image of an unknown person who is coming. Once that person is identified by the user, the algorithm written in the processor will get trained accordingly and recognize when the same person comes again and sends an in-app notification that this person came to your home.

Advantages Of The Proposed System:

Low Cost:

The proposed system remains low cost as every record is going to be stored in the edge device itself and only the notification will be sent to the user through the cloud. Here, there is no extra cost for the device regarding the storage purpose.

Less Cloudflare:

The current solution is based on the edge computing technology as it uses edge devices to perform its face recognition and the comparison part to avoid the cloud fare for the user. Because of the usage of edge devices, there is no need for the cloud to process everything.

Reduced Storage:

This system will not record every video which is going to be streamed on the mobile phone instead our system only stores the video needed by the user to store it on the cloud. This will reduce our mobile storage also.

Continuous Monitoring:

Our android app has a main feature which is live streaming through this user can monitor their households and their wards continuously from anywhere they need. The continuous monitoring will help the user to get to know about the instant scenario of their favorite place or their belongings in houses etc.,

Face Recognition:

Our system rolls with an AI algorithm to detect the human presence in front of the camera. Algorithms will detect the face in the streaming video on a mobile phone and send the notification whether it is known or unknown based on the database it has to train.

Instant Notification:

The difference between the normal CCTV and the proposed solution is instant notification where CCTV doesn't send any notification based on the activities. It will just be used to monitor where our system captures and send instant notification to the user.
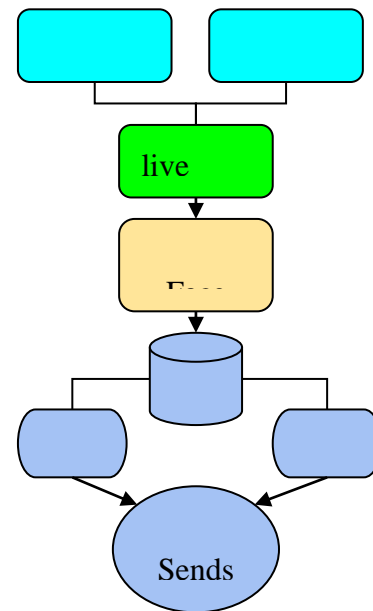

Fig 1. Architecture design

IV. SYSTEM SPECIFICATION

Hardware Specification:

Raspberry Pi - 1gb Ram
Pi-camera - V2 Version
Power Adapter - 12v
Sd Card - 32gb

Software Specification:

Os- RaspbianOs
Server - Python, Flask
App - Android Studio
Front End - Xml
Backend - Java
Database - Firebase

V. SYSTEM IMPLEMENTATION

System implementation refers to the point in software design where the analysis and modelling that are done regarding the system is realized through programming and deployment of the new system, i.e. software. The proposed

system is split into three modules. The system is built with 3GHz microprocessor for its high computation and connected with the 5 Mega Pixel Camera for providing Live streaming using one of the python framework Flask. The live feed will be given as an input for the face recognition to detect the face in the live streaming video and the algorithm will recognize the face by comparing with the already available datasets in the database. If the face is already known,our algorithm will send the notification to the user along with the corresponding name and if it is unknown, it will send as an unknown person along with the captured image of the person to the user email. The end product would be an android app built with useful features like live streaming, personal login, user logs, notifications etc.,

List of modules:

- Live Streaming
- Face recognition
- Notification
- User logs

VI. SYSTEM ARCHITECTURE

The problem of household people can be solved using this device which has a camera with an onboard processor with Wi-Fi-connectivity that can be controlled with the mobile device. This device can help wards to take care of their households and make the people lead their lives free from fear with the given features. This device sends a live feed of the device where it is kept to an android mobile and sends an alert with an image of an unknown person who is coming. Once that person is identified by the user, the algorithm written in the processor will get trained accordingly and recognize when the same person comes again and sends an in-app notification that this person came to your home.
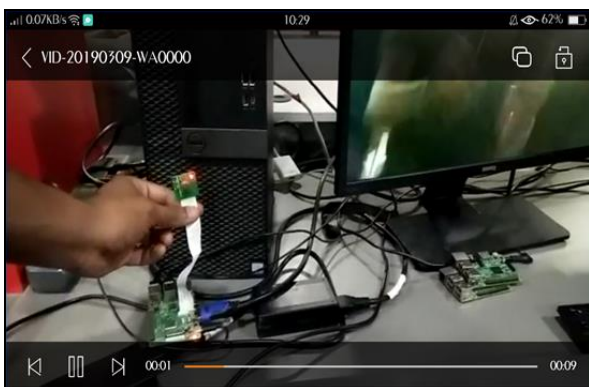
VII. EXPERIMENTAL RESULT

Fig 2 Live stream

AI Based Surveillance Bot aims at monitoring the households continuously with the face recognition technique and sends an instant notification to the user through the android app.It has an inbuilt android app with the system. The user has to download the android app from the google play store and can access the system with the unique number specified for each system.
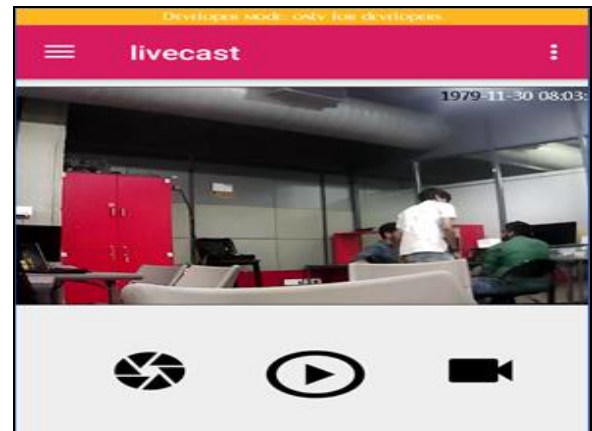

Fig 3 Android app streaming

Our system will provide the live streaming video from the camera and the algorithm takes the feed from the streaming to detect the person in the video and compares the faces with the already available database and sends an instant notification based on the person. The android app has user logs which saves the records of the previous data. The system will be cost efficient by reducing the cloud charge and reaching out to the people in a beneficial way.
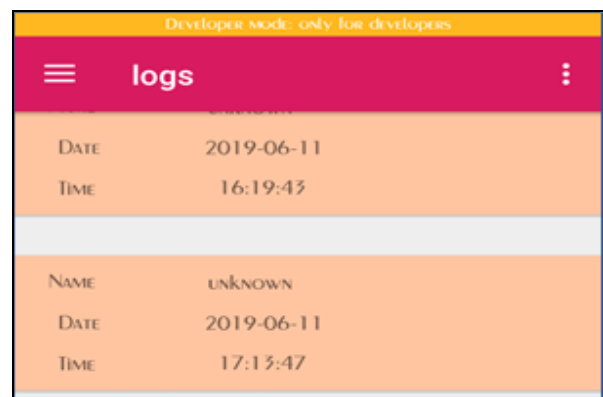

Fig 4 Notification

VIII. CONCLUSION

Thus, the solution will help the user to overcome the issues and make the surroundings feel comfortable and secured. This could also be useful in identifying the unknowns in different use cases like monitoring the patients in the hospital, Infants in the house, elderly people in their home.

This system will reduce the problem faced by the households and elderly people when they left their home alone or alone in their home.It will replace the currently available CCTV cameras with low cost solutions and provide more benefits with the trending technology. AI based surveillance bot is an eco-friendly and low-cost solution with more useful and advanced features required by the people those are alone at their home and for many other purposes also.

IX. FUTURE WORK

In future, we are going to work with the dynamic recognition and dataset creation during the live streaming phase and integrating the voice-based recognition. With the help of the android app, users could speak through the system with the opposite people. We also have an idea of integrating it with Google's voice assistant Alexa, echo dot etc., This future implementation will reduce some of the disadvantages faced by the currently available solution.

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