



## INTRUDER ALERT SYSTEM USING MACHINE LEARNING

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**ABSTRACT:** The security could be scenario within which objects, animals or people are given unique identifiers, and therefore, the ability to transfer data over network without requiring human-to- human or human-to-computer interaction. The webcam has evolved from the convergence of wireless technologies, and also the Internet. Theft of valuable objects is number of the never-ending problems within the world. Nowadays, several detecting devices are already available within the market To solve this problem, Camera footage based the theft detection is utilized in this project with the assistance of the image processing to detect the theft occurrence. The system will capture the image frames and by comparing the 2 frames, it'll be able to detect motion and immediately an alert message is sent to the owner together with captured image.

### I. INTRODUCTION

Surveillance is one in all the important aspects in various fields like banking sectors, military areas, or a personal security. Because of exponential rise in burglary and theft activities, surveillance systems are proving to be a good source of security. Because of ever-increasing technology people are wishing on advanced technologies for his or her security purposes. Security systems like CCTV have proven to be hugely popular for security purposes thanks to their cost efficient nature and the straightforward maintenance. A Surveillance is extremely helpful for enforcement to investigate/prevent criminal activities, for recognizing and monitoring threats. Also, surveillance systems have always been playing an important role in coping with the burglary cases. These CCTV systems tend to observe activities continuously. This ends up in a high power consumption and the memory wastage. Moreover, it does not give an alert on any suspicious activities detected. There are systems available apart from CCTV like the Retina scanner the fingerprint scanner, IR lasers, RFID systems only with the downside that they're cost inefficient with high implementation and maintenance costs. Hence, such systems don't seem to be preferred way for security purposes for little scale applications. Proposed system covers of these drawbacks by its efficiency, portability. This closed-circuit television is low-cost and a user-friendly too. Previous work was carried. Previous work was meted out by the face recognition and the Detection system for a security by connecting with a raspberry pi and if any unknown face is detected, to make it safer and straightforward they're to connect telegram bot. But in our project if the thief was caught and get detected by camera, the image is send to respective admin through mail. Instead of using telegram bot here we use the buzzer alert and GSM call alert system, so that everyone will understand something will happen at homes/banks.

## II. LITERATURE SURVEY

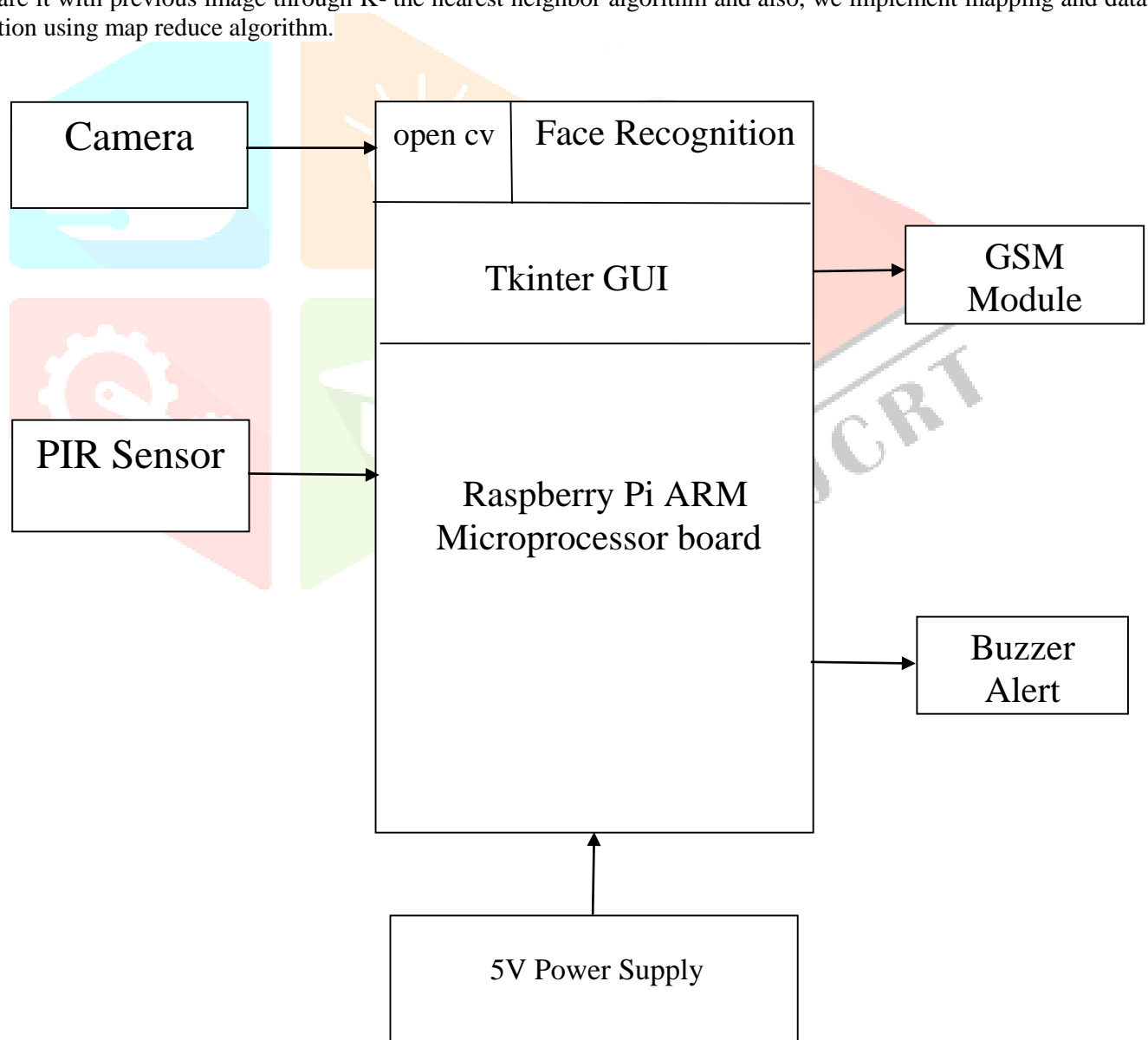
### FACE OCCLUSION DETECTION USING SKIN COLOR RATIO AND LBP FEATURES FOR INTELLIGENT VIDEO SURVEILLANCE SYSTEMS

Pengfei Ji ; Yonghwa Kim ; Yong Yang ; Yoo-Sung Kim (2016)

A face occlusion detection scheme which is based on both skin color ratio (SCR) and Local Binary Pattern (LBP) feature, is proposed. The proposed method mainly consists of four steps: foreground extraction, head detection, feature extraction, and occlusion detection. First, foreground is extracted by codebook background subtraction algorithm. Then, the head region is located using HOG head detector. After that, the skin-color ratio and LBP feature are extracted. Finally, SVM is trained based on LBP feature. The recognition result of SVM and the result of skin-color ratio feature are merged by weighted voting strategy, and then occluded faces are classified as three categories: concealed, partially concealed, and visible. Experimental results show that the proposed detection system can achieve desirable results in intelligent video surveillance systems.

## III. PROPOSED SYSTEM

This project deals with the look and implementation of Smart surveillance monitoring system using Raspberry pi. Advocates an intelligent processing approach to big surveillance video data driven by cameras. We use camera to capture and analyze the information even for a micro sec to attain high security in home. It's capturing the image and compare it with previous image through K- the nearest neighbor algorithm and also, we implement mapping and data reduction using map reduce algorithm.



**Fig.1** Block Diagram of Proposed system

### III. DESCRIPTION

Here we use a raspberry pi as it supports the camera and the clock speed is faster. The camera is connected with the open CV for a face recognition. Tkinter GUI is the standard GUI library for a python. A Python when combined with Tkinter provides fast and easy way to create GUI applications. PIR is an electronic sensor that measures an infrared light radiating from object in its field of view. They are commonly used in security alarms and automatic lighting application. This sensor detects a general movement but do not give information on who or what moved. For that purpose, imagining an IR sensor is required. GSM modem or module is a hardware device that uses GSM Mobile telephone technology to provide data link to a remote network. The face that was detected by camera after that its ends the respective person image to authorize person.

### IV. DEVICE REQUIREMENTS

#### OPEN CV

Open CV (Open Source Computer Vision) is a library of programming functions mainly aimed at real-time computer vision. Originally developed by Intel, it was later supported by Willow Garage the n Itself (which was later acquired by Intel). The library is cross-platform and free for use under the open-source BSD license. Open CV supports the deep learning frameworks TensorFlow, Torch/PyTorch an caffe. The GSM module is a hardware device that uses mobile telephone technology to provide data link.

#### GSM MODULE

- The Module No. is Simcom SIM800/900 2G Module.
- The Quad-Band **GSM(2G) GPRS/EDGE 800/900MHz** is used and GPRS mobile station class B is used.
- The power supply is +5V and supply voltage range is 3.1-4.8V.
- It is fully compatible with Arduino/Raspberry Pi/AVR/PIC/ARM/FPGA.
- It is controlled via AT commands.

#### PIR SENSOR

- PIR Sensor is used for human body detection and general movements.
- It is an advanced accuracy sensor with low noise and high sensitivity.
- It has a wider supply voltage range of 3.8-24Vdc.
- It's Adjustable Delay Time is from 2 seconds to 70 minutes and Adjustable Sensitivity is about 3 to 10 Lux.
- The Adjustable Detecting Length is 6 to 8 meters.
- It has a Standard TTL Output.

#### RASPBERRY PI CAMERA BOARD

- It is fully compatible with both the Model A and Model B Raspberry Pi.
- It has a 5MP Omnivision 5647 Camera Module.
- It has a still picture resolution of 2592 x 1944 and it supports video range of 1080p @ 30fps, 720p @ 60fps and 640x480p 60/90 Recording.
- There is a 15-pin MIPI Camera Serial Interface which plugs directly into the Raspberry Pi Board.
- It's size is about 20 x 25 x 9mm and weight is 3g.

#### INTERFACING CAMERA

- The camera is enabled in raspi - config.
- The command line tool for capturing still picture is raspistill -o image.jpg. The command line tool for capturing motion picture is raspivid -o video.h264 -t 10000.

### V. METHODOLOGY

When the particular person moves across the camera the face is detected and captured using image processing, if it matches then them mail with detected image and call alert is given to the authorized person using GSM during night time and mail with detected image and buzzer alert in the morning.

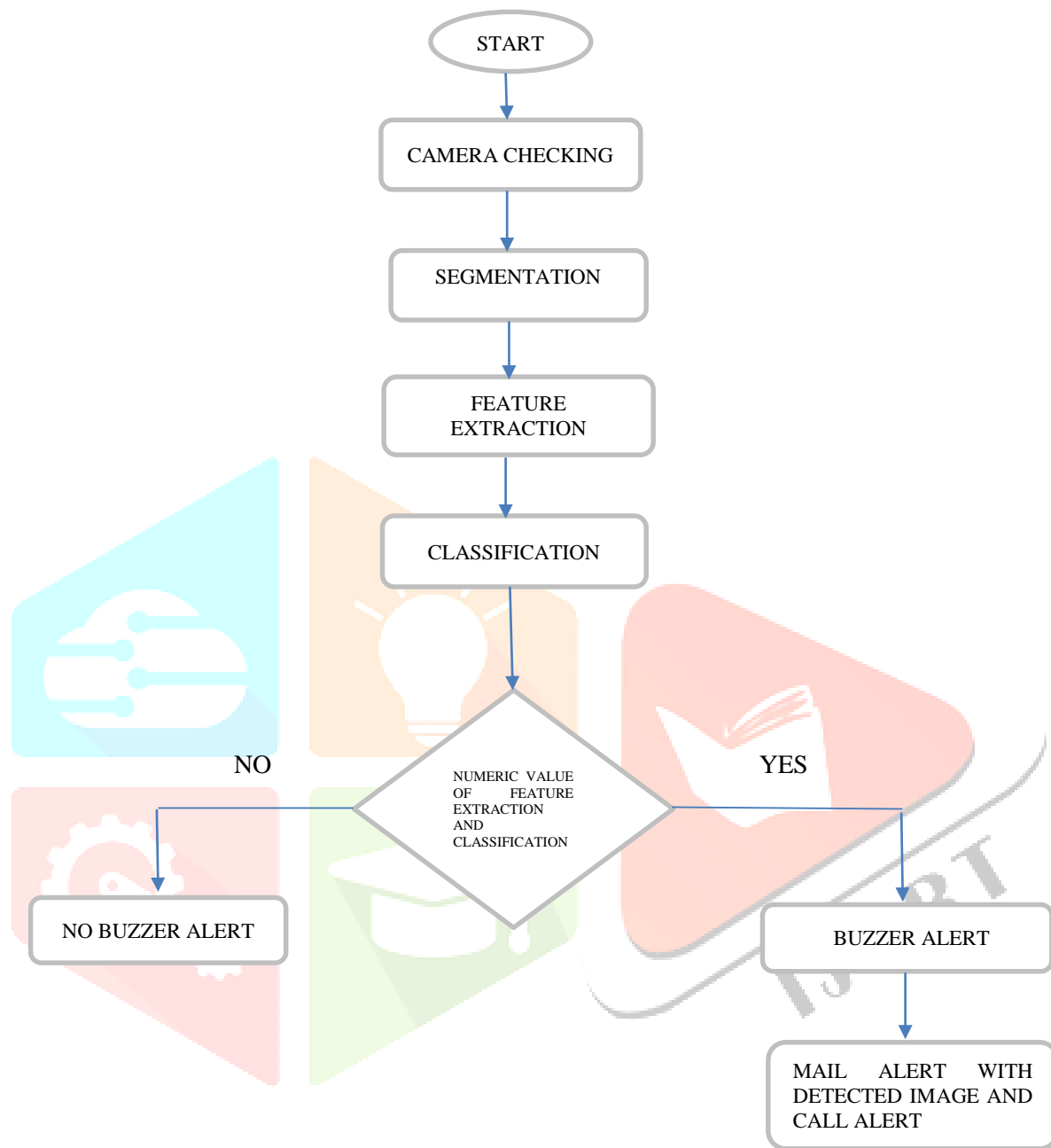
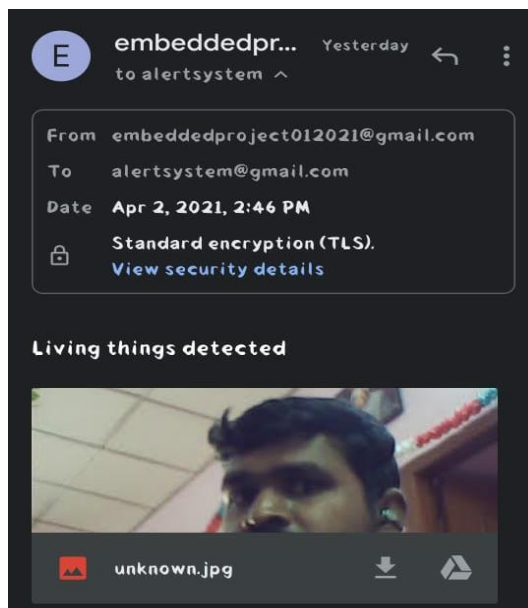
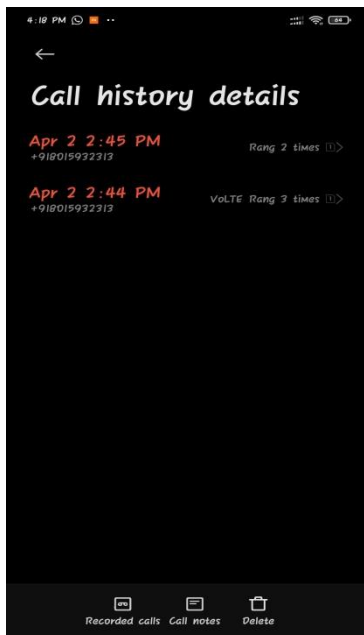


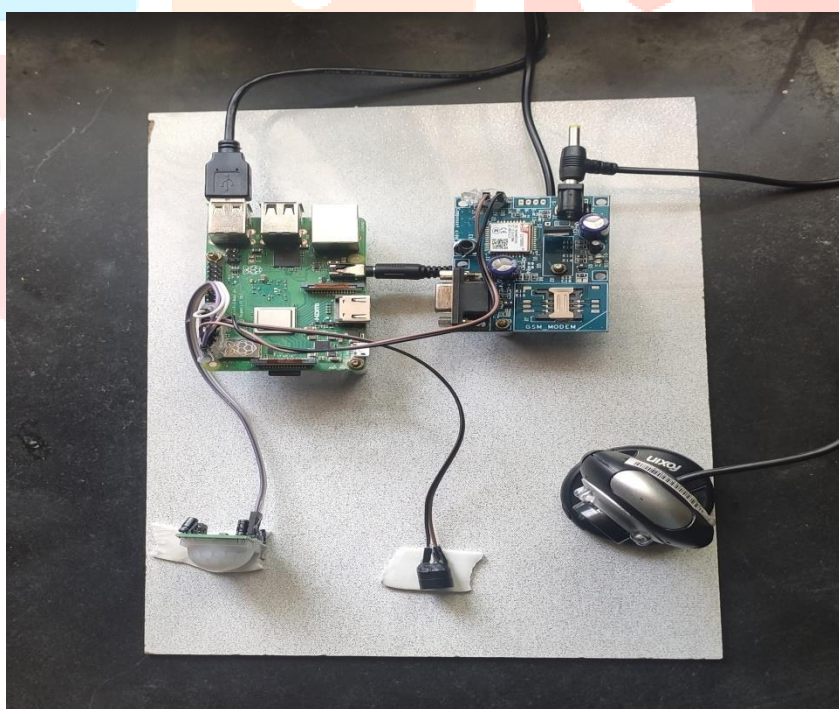
Fig.2 Flowchart

## VI. OUTCOME



Thus, when the face is detected, like the above shown picture the authorized person will receive a call alert and mail alert with the captured image.

## VII. HARDWARE SETUP



## VII. CONCLUSION

In this modern era, machine learning and IoT have become two of the most prominent fields which have made our lives easier, safer and efficient through variety of their applications. In almost every aspect of our daily life, we can see the benefits of these fields. However, our effort was to develop a helping hand for maintaining security at important places. Faces were extracted out of images and the machine was trained with some positive and negative images. We then successfully tested the system with different configurations and different known and unknown people. The test results were recorded and we achieved 95% accuracy in recognition in fluorescent lighting conditions.

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