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# DEVELOPEMENT OF VISION BASED INTELLIGENT HIGH SECURITY SYSTEM FOR INDUSTRIAL APPLICATIONS

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***ABSTRACT:** An intelligent security system that provides a high level of home security using visual surveillance is developed. This will be very much useful in home and company automation. The main processing unit is a Raspberry pi processor with Raspberry pi operating system and the board we are using is Beagle Bone Black (BBB). Surveillance system is achieved using Surveillance system is achieved using Open CV (open source computer vision) and the communication system is designed by using GSM (Global System for Mobile Communication) Module. Total number of people in a room is counted by using the open cv. The user while leaving the premises can give Security Key to make the system active. The system continues automatic surveillance when the user left the house or office. It can be modified to turn on automatic surveillance at a specific time of the day. If the user left the premises and the system detects the presence of a human being in there then an SMS will be sent to the Cell phone of the user and the alarm will be turned on, and also an E-MAIL will be sent to the user by using Ethernet / LAN. After turning on the alarm the system will start recording video on the SD card so the user can inspect later. The system can also count the number of people in the room by using image processing algorithm and will automatically turns off all the load in the room when no one is present. This will also help to reduce the unnecessary wastage of power.*

***KEYWORDS:** Raspberry Pi B+, GSM Modem, Open CV, CMOS Camera, Python, LAN/Ethernet.*

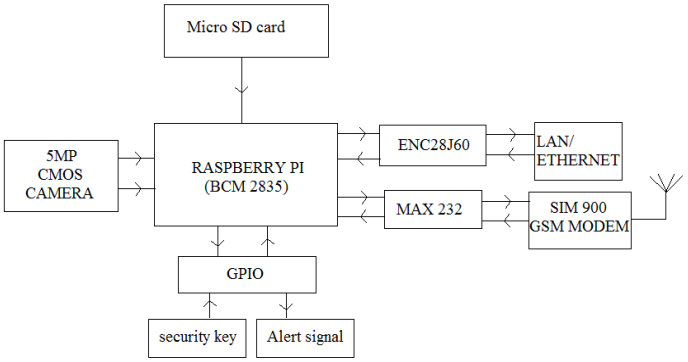
## INTRODUCTION:

We are living in reality as we know it where wrongdoing has been expanding predominantly. Wrongdoing aversion is one of objectives of flow research. This is on the grounds that it spares important lives, cash and time. Home and work put turn into the casualties of wrongdoing. Many individuals have begun utilizing different sorts of security framework to avert unapproved trespasses in their property. Such framework feels individuals somewhat sheltered while they are voyaging or remaining outside for work. A large number of these frameworks work just inside a specific limit. For instance CCTV camera footage must be seen while the client or

the watch is in the control room. The current existing home security framework for hostile to robbery and fire framework incorporates infrared beams for info prepare. Despite the fact that these sorts of security framework are far reaching yet there are still a few deformities, for example, the scope of infrared based home security framework is 4 to 5 meters.

In this venture we have attempted to build up an insightful framework that gives home security, programmed individuals is numbering and programmed vitality sparing. (i) Our module include individuals a room and afterward control the heaps on the room and when there is no individuals then the module goes to the reconnaissance mode for giving security benefit. (ii) The quantity of individuals check is finished by one overhead camera at the passage of a room. The check is finished by foundation subtraction technique in CSI. At that point when there is no individual in room another camera works for reconnaissance framework. Movement identification calculation and human discovery is done in CSI. In the event that any human is distinguished in the reconnaissance mode then utilizing the GSM module, message is sent to the proprietor of the house, furthermore an Email will be sent to the client by utilizing Ethernet/LAN . The client can reset the framework sending a SMS from his mobile phone. These diverse sub procedures are run particularly and kept up by a principle procedure. For better identification the camera was mounted vertically as for the plane of the floor. (iii) Our framework not just tallies the quantity of individuals present in a room additionally gives offices home computerization framework by killing every one of the heaps in the private or office room.

## II. BLOCK DIAGRAM AND DESCRIPTION




### BROADCOM BCM2835:

Unique Raspberry Pi depends on the Broadcom BCM2835 framework on a chip (SoC), which incorporates an ARM1176JZF-S 700 MHz processor, VideoCore IV GPU,and was initially transported with 256 megabytes of Smash, later redesigned (models B and B+) to 512 MB. The framework has Secure Advanced (SD) (models An and B) or MicroSD (models A+ and B+) attachments for boot media and tireless stockpiling

### RASPBERRY PI:

Raspberry pi includes two models Demonstrate An and Display B. The Raspberry Pi Show An is here, this is the perfect model for anybody on a financial plan yet at the same time needs a bit of the Pi. The charge card estimated PC is equipped for a hefty portion of the things that your desktop PC likes, spread sheets, word-preparing and amusements. It likewise plays top quality video. The mystery sauce that makes this PC so little and effective is the Broadcom BCM2835, a Framework on-Chip that contains an ARM1176JZFS with gliding point, running at 700 MHz, and a Video center 4 GPU. The GPU gives Open GL ES 2.0, equipment quickened Open, and 1080p30 H.264 prominent disentangles and is equipped for 1Gpixel/s, 1.5Gtexel/s or 24 GFLOPs of broadly useful process. What's that all mean? It implies that in the event that you connect the Raspberry Pi to your HDTV, you could watch Blue-beam quality

video, utilizing H.264 at 40MBits/s.

## 5MP CMOS CAMERA:

CMOS sensors have hardware at the pixel level. This implies each pixel on the sensor is perused and transmitted all the while, planning voltage for the chip. The chip then uses extra innovation, for example, speakers, clamour redress, and digitization, to change over the voltage to computerized information. This implies CMOS sensors don't require a different picture processor. Since CMOS sensors can change over visual data to advanced information more rapidly than CCDs, they require less power, which jelly battery life. Be that as it may, the additional innovation on the sensor swarms the pixels, restricting their capacity to catch light and bringing about for the most part poorer visual clarity in the last picture. CMOS sensors are normally outlined with moving screens, particularly on business applications. This implies the picture casing is uncovered from one side to the next, rather than at the same time as on CCD sensors. For instance, a camcorder utilizing a CMOS sensor may record information in a "moving" range from left to right, or start to finish. This outcomes in the potential for a couple sorts of mutilation not found on CCD sensors.

## GSM MODEM:

GSM modem offers ability to send SMS with no versatile working framework. SIM can be perused with MCU and can be utilized to send SMS by small scale controller. Consequently a GSM modem was utilized; its principle work here was the point at which the parameters are over edge limits it sends an instant message to predefined contacts about the circumstance of the individual accordingly alarming them to continue for further activities.


## MAX232:

The MAX232 gadget is a double driver/recipient that incorporates a capacitive voltage generator to supply EIA-232 voltage levels from a solitary 5-V supply. Every recipient changes over EIA-232 contributions to 5-V TTL/CMOS levels. These recipients have a run of the mill edge of 1.3 V and a normal hysteresis of 0.5 V, and can acknowledge ±30-V inputs. Every driver changes over TTL/CMOS input levels into EIA-232 levels. The driver, collector, and voltage-generator capacities are accessible as cells in the Texas Instruments LinASICE library. The MAX232 is described for operation from 0°C to 70°C. The MAX232I is portrayed for operation from -40°C to 85°C.

## LAN:

A neighbourhood (LAN) is a PC system that traverses a generally little range. Most LANs are limited to a solitary building or gathering of structures; be that as it may, one LAN can be associated with different LANs over any separation by means of phone lines and radio waves. An arrangement of LANs associated along these lines is known as a wide-region organize (WAN). Most LANs associate workstations and PCs. Every hub (singular PC ) in a LAN has its own particular CPU with which it executes programs, however it additionally can get to information and gadgets anyplace on the LAN. This implies numerous clients can share costly gadgets, for example, laser printers, and information. Clients can likewise utilize the

LAN to speak with each other, by sending email or participating in talk sessions.

## POWER SUPPLY:

The Power Supply is an Essential necessity for the venture work. The required DC control supply for the base unit and additionally for the energizing unit is gotten from the mains line. For this reason focus tapped auxiliary of 12V-012V transformer is utilized. From this transformer we getting 5V control supply. In this +5V yield is a directed yield and it is composed utilizing 7805 positive voltage controller. This is a 3 Stick voltage controller, can convey current up to 800 milliamps

## GENERAL PURPOSE I/O (GPIO):

There are 54 universally useful I/O (GPIO) lines split into two banks. All GPIO pins have no less than two option works inside BCM. The substitute capacities are typically fringe IO and a solitary fringe may show up in every bank to permit adaptability on the decision of IO voltage. The GPIO fringe has three devoted intrude on lines.

## III. WORKING:

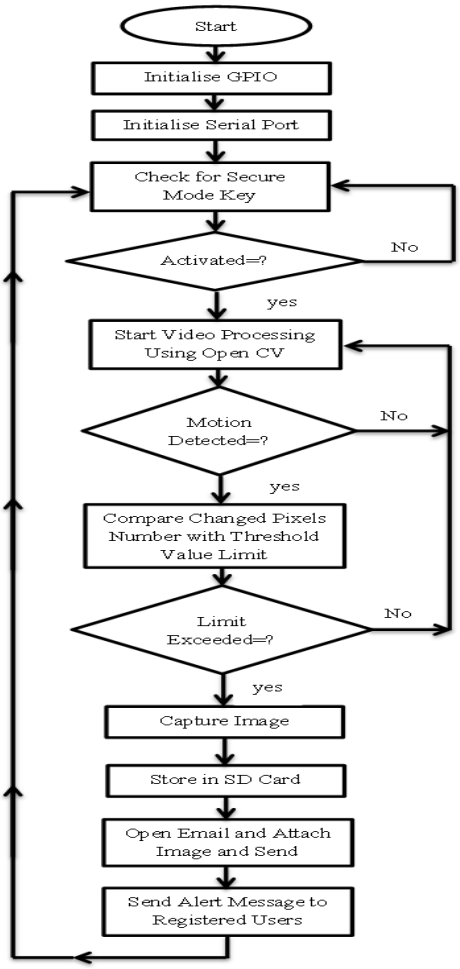
Vision based clever home robotization System gives an abnormal state of home security utilizing visual reconnaissance. When we leave our premises and going out we ought to initiate the security key and afterward it begins video handling by open CV. The principle handling unit is a Raspberry pi processor with Raspberry pi working framework and the board we are utilizing is Beagle Bone Black (BBB). In the event that any unapproved individual goes into our home GPIO enacts and gives ready flag. Add up to number of individuals in a room is tallied by utilizing the Open CV. The 5MP CMOS Camera catches the picture of individual who enters and a SMS will be sent to portable of the client by GSM Modem and the alert will be turned on, in the wake of turning on the caution the framework will begin recording video on the SD card and stores the information on SD card. so the client can investigate later and an E-MAIL will be sent to the client by utilizing Ethernet/LAN.

Observation framework is accomplished utilizing open CV and the correspondence framework is composed by utilizing GSM (Global System for Mobile Communication) Module. We can set the edge esteem to change the pixels. The framework proceeds with programmed reconnaissance when the client went out or office. This framework is exceptionally adaptable that we can screen by sitting in our office. The whole code is created utilizing python dialect.

## FLOW CHART:

At the underlying stage the initial step to be performed is to initialise GPIO. After Initialisation of GPIO then in further stride Serial Port is to be initialised. At that point Serial Port checks for Secure Mode Key. In the event that the Key is initiated it begins Video Processing utilizing Open CV. On the off chance that the Key is not enacted it about-faces and sits tight for the way to wind up distinctly dynamic. While Video is preparing if movement gets identified it contrasts changed pixels number of picture and Threshold esteem restrict. On the off chance that movement is not distinguished it does a reversal and begins preparing the video once more. In the wake of contrasting the pixels number and certain esteem restrain, if confine gets surpassed the picture gets caught. If not does a reversal and begins video handling utilizing Open CV. After the picture is caught it gets put away in the SD Card for client access to have a look at it. Later an E-MAIL is opened and picture is appended and sent to the enlisted

client by a ready message.




## IV. CONCLUSION:

In this Paper we have presented outline and usage of a minimal effort, adaptable answer for the home computerization. The framework is secured for access from any client. The clients are relied upon to gain blending secret word for the Raspberry PI the wireless to get to the home apparatuses. This includes an assurance from unapproved clients. This framework can be utilized as a proving grounds for any machines those requires on-off exchanging applications with no web association. The full usefulness of the home computerization framework was tried

## V. FUTURE WORK:

At present, the Raspberry gadget is too expensive to fit effectively into a prior divider switch electrical box. There are a few ways this could be enhanced in future work. The utilization of surface mount segments would significantly diminish the general size of the parts. Surface mount segments are additionally regularly less costly as they require less material to deliver.

This would diminish the general cost of the gadgets and also the size. Another zone to enhance the size is the circuit board that is utilized. As of now for the model, a non specific breadboard style board was utilized. On the off chance that this gadget was to be economically created, a more minimized circuit board could be planned.

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