

PRISON BREAK MONITORING AND ALERTING SYSTEM USING IOT

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ABSTRACT: Well it is a quite shocking fact, but prison escapes are not very uncommon occurrences. There is no exact data count, but we have all heard and still keep hearing of a variety of prison escapes happening globally. The fact that such number of inmates may still be roaming among us is itself scary. Well so here we propose a prisoner tracking system that helps detect prison breaks and instantly alert authorities using IOT. The system makes use of a microcontroller-based circuit to achieve the task using rf technology. We make use of RF trackers on each inmate to detect their presence in the premises. The 2 central monitoring units are used to scan through all inmates as per data fed to it and constantly keep track of each prisoner. Each prisoner is mounted with an rf tracker transmitting a unique prisoner code wirelessly. Whenever a prisoner exits the facility the centralized system is unable to receive his/her code. At that time the receiver circuitry instructs the controller to take action against particular prisoner. The System now transmits the prisoner details over to the officers alerting portal to send out instant alert and catch the prisoner before he runs even 50 meters away from the facility. Here we use IOTGecko to develop the online alerting portal

system to receive input from monitoring device and display alert and sound alarm through internet.

Keywords- *IOT, alerting system.*

1. INTRODUCTION

The prison system in India, as known to everyone, is not as good as we see in the films. It is quite shocking to know that in a digitally modern country like India, the prison system is quite orthodox. So in such an orthodox system the jail breaks are very common and most usual thing to happen. There is no such count but prison escapes keep happen, either at large scale or in smaller scale. A thought of these inmates still roaming around within us is itself very scary. The changes required in the today's prison system is that, that the system should be a bit digitalized rather than using human force to guard the inmates. The digital system to be used can be made reliable that it can't be under cyber attack. There are some more aspects that can be used to make this system more reliable against cyber attack.

This paper targets on the condition that if the prisoner tries to escape from the jail his/her movement can be detected as soon as his/her presence is not been found in the cell or the area he/she is supposed to be in.

Geo-fencing has been done and Laser is used to fail the idea of escaping. This paper gives a review on various Prison Security and Safety devices that are based on Wi-Fi, Bluetooth for Internet as communication mode, as communication mode. But both of these systems have their own restrictions. Wi-Fi and Bluetooth devices have a primary flaw of limited range. Poor internet connectivity can be an issue in densely populated areas and multistory buildings.



Fig.1: Example figure

Well so here we propose a prisoner tracking system that helps detect prison breaks and instantly alert authorities using IoT. The system makes use of a microcontroller based circuit to achieve the task using RF technology. We make use of RF trackers on each inmate to detect their presence in the premises. The 2 central monitoring units are used to scan through all inmates as per data fed to it and constantly keep track of each prisoner. Each prisoner is mounted with a RF tracker transmitting a unique prisoner code wirelessly. Whenever a prisoner exits the facility the centralized system is unable to receive his/her code. At that time the receiver circuitry instructs the controller to take action against particular prisoner. The System now transmits the prisoner details over to the officers alerting portal to send out instant alert and catch the prisoner before he

runs even 50 meters away from the facility. Here we use IOTGecko to develop the online alerting portal system to receive input from monitoring device and display alert and sound alarm through internet.

2. LITERATURE SURVEY

2.1 *IoTbased Prisoner Escape Alert and Prevention System:*

At present, the prison has the surveillance camera and few security guards are employed to monitor the illegal movement of prisoners approaching near perimeter wall with the intention to escape from prison. These approaches were easily botched by prisoners to deviate the officials to move away from their positions. Prisoners makes use of this opportunity to flee away from prison. To control this undesirable situation, techniques like implanting pressure sensors in the perimeter wall,CCTV surveillance with image processing based solutions, Drones etc are available. Deployment of these techniques incurs high cost, does not give exact location of the prisoner. Hence, IoT based prisoner escape detection technique has been proposed in this work. In this work, two approaches were discussed: i) Light source based approach-Deploying laser and GSM module to detect intrusion near the perimeter wall, ii)Geofencing based approachEach prisoner would be having a wearable, non-detachable component which has GPS, GSM and microcontroller. Prisons perimeter wall coordinates are geo fenced and any attempt to reach the perimeter wall would alert the prison officials through repeated phone calls and alert systems will be activated. Even if the prisoner is away from prison, his physical location can be tracked using latitude and longitude information. Main challenge in deploying this

module is battery life. Since the device is retrieving the latitude and longitude information quite often, battery power would be drained. Therefore, power to the wearable device can be derived through solar energy, kinetic movements wireless charging etc.

2.2 Prison Monitoring IBEACON and Arduino Microcontroller:

In this, we are going to monitoring the prisoner activities in the jail environments using the Arduino controller and heart beat sensor. Ibeacon/GPS is used for notifying prisoner to the Smartphone or computer devices and to find out current location of person passed on the jail and maintain the record in details of the prisoner for find the location and pointed the person, In many applications and methods ibeacon is used such as patient monitoring and store navigation, disaster recovery . Evidence of the prisoner obtainable is transmitted to the authorized user, future where location evaluation is performed by calculating times and speed of the person crossed on the road. Then, heart beat senor and ibeacon is attached with prisoner hand to monitor them. That prisoner's location and health status are monitoring in the receiver side. Position of Bluetooth transmitters' signal levels at certain point data will be stored is known base stations. All that information will be used for store about that person information in the nearest base station. When it comes to using more evidence of Ibeacon further it broadcast the information with low frequency.

2.3 GPS based Hadcuffs System(using PIC 18f4550and GSM):

The main objective of this paper is to simplify the surveillance system in the jails without any human error using GPS and GSM. In general when police

authorities and law enforcement agencies need to monitor movement of some suspected person or when a suspect is prohibited from moving out of a particular geographical system, it is very difficult to keep a constant watch on the suspect. Even it is difficult to track if any prisoner among the huge number of prisoner's escapes from the prison through underground tunnel or by hiding in some kind of opaque objects. For such situations we propose a GPS and GSM based handcuff system that will keep the track of the suspect. Now the prisoner is allowed to move within a particular geographical area. When the prisoner moves within any geographical area the system on prisoner is in range of the prison/house or facility system and it does not track him. This is done by using RF wireless system. Now as soon as prisoner goes out of the specific geographical area the system detects that the receiver is not receiving signals from the transmitter mounted in the prison. The system sends an alert message to the receiver indicating the escape of prisoner. Then the GPS tracks down the prisoner by sending the real-time location of prisoner through GSM module by sending SMS. Thus this system automates the entire process of surveillance, house arrests and for patient monitoring using a PIC family microcontroller.

2.4 Bluetooth in Wireless Communication:

Bluetooth is a method for data communication that uses short-range radio links to replace cables between computers and their connected units. Industry-wide Bluetooth promises very substantial benefits for wireless network operators, end workers, and content developers of exciting new applications. This article delves into the implementation and architecture of Bluetooth. It also describes the functional overview and applications of Bluetooth, and deals with the

development of a model for recording, printing, monitoring, and controlling of eight process variables at the same time, using a distributed control system. We explain industrial automation via Bluetooth using IISS. Industrial automation is one of the major applications of Bluetooth technology. Industrial automation, in terms of controlling or monitoring a factory, office, or industrial process, means to install machines that can do the work instead of human workers. Industrial plants consists of many devices interconnected in different ways ranging from simple data collection units (I/O) to more intelligent devices such as sensors, one-loop controllers, or programmable controllers, and a supervisory system used as a human-machine interface (HMI) for data logging and supervisory control. An IISS is a controlling device that monitors the devices in a company. It basically communicates via the interface card in the PC; the hardware is connected parallel across the device, and it is interfaced with the PC via a transceiver. The device can be accessed both manually via the switches and remotely via the PC. A simulation of connecting a PC with the machines in a company was executed. Also, we wrote a software program using C language; we will show how the remote monitoring takes place between the control room and the PC. These details in the article establish the growing need for Bluetooth technology.

3. IMPLEMENTATION

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IOT Prison Break Monitoring & Alerting System (Receiver section)

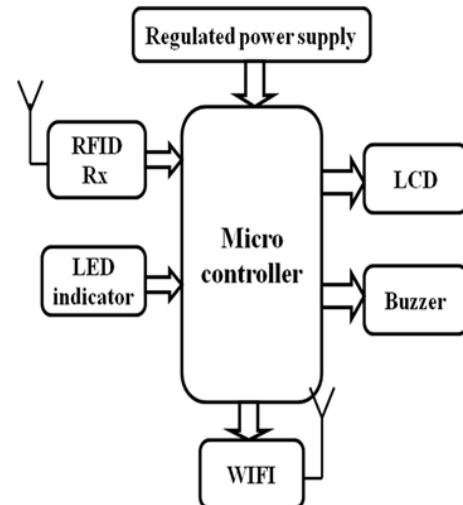


Fig.2: Block diagram

POWER SUPPLY:

All digital circuits require regulated power supply. In this article we are going to learn how to get a regulated positive supply from the mains supply.

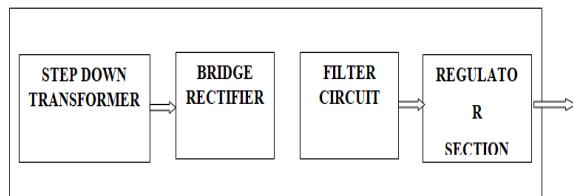


Fig.3: Power supply

TRANSFORMER:

A transformer consists of two coils also called as “WINDINGS” namely PRIMARY & SECONDARY. They are linked together through inductively coupled electrical conductors also called as CORE. A changing current in the primary causes a change in the Magnetic Field in the core & this in turn induces an alternating voltage in the secondary coil. If load is applied to the secondary then an alternating current will flow through the load. If we consider an ideal condition then all the energy from the primary circuit will be transferred to the secondary circuit through the magnetic field.

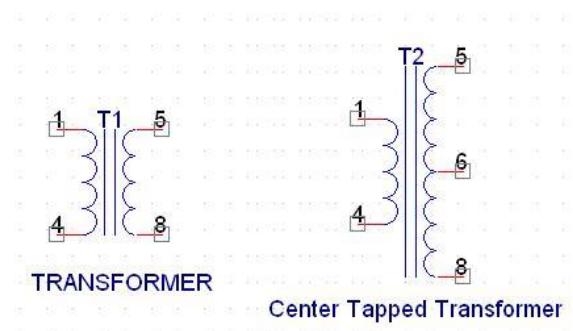


Fig.4: transformer

LCD MODULE:

To display interactive messages we are using LCD Module. We examine an intelligent LCD display of two lines, 16 characters per line that is interfaced to the controllers. The protocol (handshaking) for the display is as shown. Whereas D0 to D7th bit is the Data lines, RS, RW and EN pins are the control pins and remaining pins are +5V, -5V and GND to provide supply. Where RS is the Register Select, RW is the Read Write and EN is the Enable pin. The display contains two internal byte-wide registers, one for commands (RS=0) and the second for characters to be displayed (RS=1). It also contains a user-programmed RAM area (the character RAM) that can be programmed to generate any desired character that can be formed using a dot matrix. To distinguish between these two data areas, the hex command byte 80 will be used to signify that the display RAM address 00h will be chosen. Port1 is used to furnish the command or data type, and ports 3.2 to 3.4 furnish register select and read/write levels. The display takes varying amounts of time to accomplish the functions as listed. LCD bit 7 is monitored for logic high (busy) to ensure the display is overwritten. Liquid Crystal Display also called as LCD is very helpful in providing user interface as well as for debugging purpose. The most common type of LCD controller is HITACHI 44780 which provides a simple interface between the controller & an LCD. These LCD's are very simple to interface with the controller as well as are cost effective.



Fig.5: LCD

BUZZER:

A buzzer or beeper is an audio signaling device, which may be mechanical, electromechanical, or electronic. Typical uses of buzzers and beepers include alarms, timers and confirmation of user input such as a mouse click or keystroke.

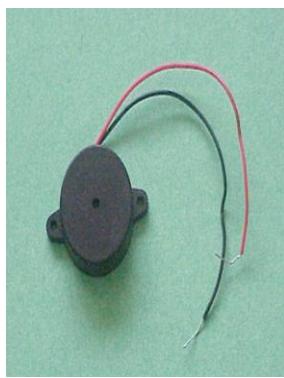


Fig.6: Buzzer

5. EXPERIMENTAL RESULTS

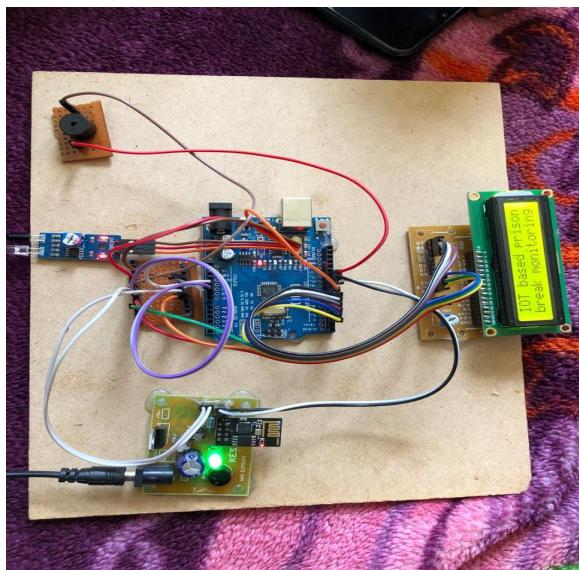


Fig.7: Output screen

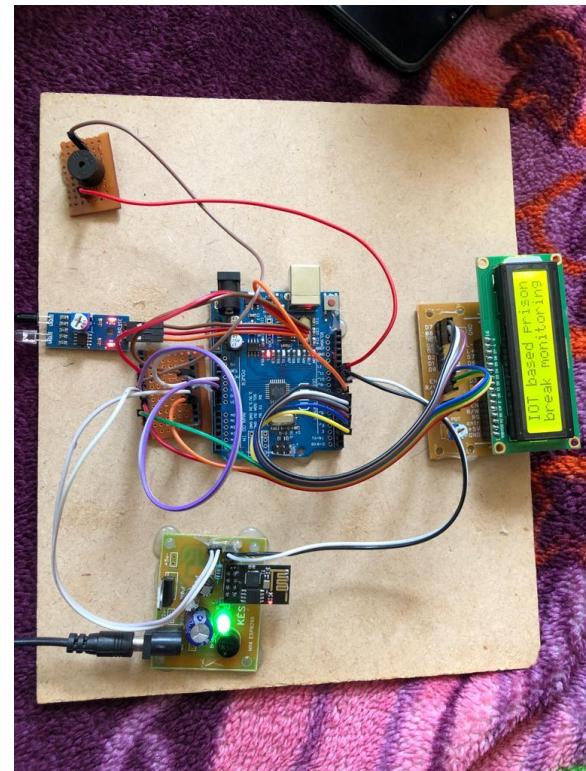


Fig.8: Output screen

6. CONCLUSION

The conclusion of the project is that if this system is implemented in our prison system it would add a new level to the security rules of our country. This system will bring some difference in the number of jail breaks happening per year.

7. FUTURE SCOPE

If any time in future this system is implemented it can be made using nanotechnology reducing the size of the transmitter into a small chip. This chip can be planted anywhere on the inmates clothes without giving the inmate any clue of it. Even GPS system can be added on the chip making it easier to be tracked.

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