Border Security using IoT

Pooja S N
U G Student
Department Of Electronics And Communication
Rajarajeswari College Of Engineering
Bangalore , India

Spurthi T M
U G Student
Department Of Electronics And Communication
Rajarajeswari College Of Engineering
Bangalore, India

Rashmi R K
U G Student
Department Of Electronics And Communication
Rajarajeswari College Of Engineering
Bangalore ,India

Samreen Unnisa
U G Student
Department Of Electronics And Communication
Rajarajeswari College Of Engineering
Bangalore , India

Deepika J
Assistant Professor
Department Of Electronics And Communication
Rajarajeswari College Of Engineering
Bangalore, India

Abstract-Terrorists cross our borders unknowingly. It is not possible for our soldiers to watch the borders at each and every moment. An essential requirement in security is the capability to automatically detect terrorist in borders . In this paper we propose an robot which identifies terrorist using IR sensor and capture image of terrorist using pi camera and sends notification to respective admin. If admin accept to shootout that terrorist then that notification is sent back to robot through server to kill that person, if admin decline to shootout then the process will stop their itself. This development enables security personnel to effectively detect terrorist at low cost.

Keywords – IR sensor, Raspberry pi, Robot, Pi Camera,

I.   INTRODUCTION

An autonomous robot system is an innovation of modern technology. It has been able to provide significant support to mankind by accomplishing task that is impossible for human beings. These robots can be used to accomplish tasks like rescue, security, surveillance in unstructured and natural environments. An Internet-based intelligent robot security system, "iBotGuard" in [2] detects trespassers using face recognition algorithm. System can detect a trespasser using intruder detection subsystem which relies on invariant face recognition and it tracks the trespasser using intruder tracking subsystem based on streaming technology. Intruder detection subsystem captures images periodically when it detects trespasser in a secure area and verifies whether the object detected is human using invariant face recognition algorithm then robot will alert the security guards through alert signal using internet. The security guards use the images in robot camera to control robot motion and to recognize trespasser. The reconnaissance robot [3] can be operated in three different ways in accordance with user requests and possessions of

task: (a). Patrolling mode: Here reconnaissance robot roams in the environment and tracks predefined routes unconventionally. It will send key information related to security to the server for further analysis. (b). First Responder mode: The reconnaissance robot will work in collaboration with fixed monitoring devices and it is programmed. It will be directed to target location in order to perform on-site inspection when a security related event is reported by one of the monitoring device. Obstacles in its path can be avoided by creating a deviation or unswervingly jumping over them. (c). Remote Control mode: In this mode remote user will navigate the surveillance robot to the target region. Security system can be accessed by the users through PCs, mobile phones and PDAs.

II.   LITERATURE SURVEY

1."Human Motion Detection Using Passive Infrared Sensor" K Sravani, Md Parvez Ahmed, N Chandra Sekhar, G Sirisha,V Prasad.International journal of research in computer application and information vol-2,issue-2,march-april,2014.The objective of this project is to develop a motion sensor alarm based on a Passive Infra-Red (PIR) sensor module. In this project, microcontroller continuously monitors the output from the sensor module and turns a buzzer on when it goes active. The application areas of this project are: All outdoor lights, Lift lobby, Multi apartment complexes, common staircases, for basement or covered parking area, shopping malls, for garden lights.

2."Border Surveillance using sensor based thick-lines" Ramzi Bellazreg , Noureddine Boudriga, Sunshine28-30,Jan,2013,information networking(ICOIN). The primary objective of the deployment research is to find the deployment strategy using the minimum number of each

type of sensors to cover the whole surveillance area and to achieve a desired intrusion detection probability when intruders near the border. minimum number of each type of sensors to cover the whole surveillance area and to achieve a desired intrusion detection probability when intruders near the border. minimum number of each type of sensors to cover the whole surveillance area and to achieve a desired intrusion detection probability when intruders near the border.

3."Advanced Border Intrusion Detection and Surveillance Using Wireless Sensor Network Technology". IJCNS 251-259,2013.This paper surveys the literature for experimenting work done in border surveillance and intrusion detection using the technology of WSN. The role of WSN in border surveillance, as in most WSN applications, focuses on information gathering from various types of sensors, such as seismic, camera, and motion detectors. Some advanced WSN process these raw data and send an abstracted alarm or aggregated data to the command center, which, in turn, takes the appropriate defence action

4."Defence Security Systems".IEEE , Harry J. woodroof, Ase k jakobsson , 8 sep 2014.The main purpose of the project is to enhance the border security electronically with automation and with that to reduce the work load and responsibility of the soldiers that continuously take a look on border 24x7. This project will not fully remove the responsibility of soldiers but shares the maximum responsibility and will reduce human efforts on the border. 5."Wireless sensor networks to prevent unauthorized entry into critical military borders" .IEEE 20 jan 2011,Yan-Xio Li, Lian Qin, Qian Liang. Human activity at border is performed by the system with the help of PIR Sensor. This will alert if someone enter at border. In second stage the system is going to detect whether the person is carrying a weapon or not. If a person is carrying a weapon then it will alert at monitoring area about the weapon by using metal detector sensor. Then at the final stage capturing the image of the person entering at military border is performed. For this the system uses a camera which is capable of capturing the image clearly when the person is near to it. After capturing the image ofthe unauthorized person, image processing is used to process the image. By the use of MATLAB the image is processed and transmits to the required destination i.e. monitoring section. The transmission is possible through ZIGBEE. Thus the human activities and penetration of terrorist are easily monitored and can be prevented at high dense fog and critical military borders.

III. PROPOSED SYSTEM

The point of this project is to build up an implanted intruders identification framework in border by utilizing IR sensor. There are numerous IR sensors being used today however the sensor that is utilized will identify the Infrared beams that are transmitted from the human body. There is a need to use PI camera because, we are using PI Camera for detecting intruders. We realize that in border

there are numerous circumstances that happen, so every movement our soldiers can't watch the borders then intruders can enter our border by unknowingly and they may attack. At the point when an unknown person is recognized in the scope of that IR sensor at that point it sends the flag to the raspberry pi and pi camera starts capturing the images. After capturing images, it will compare with database stored in the server, if image is does not match with any image then robot will shootout that person . At that point the protect operation will be quick in identifying the people who are enter unknowingly. Robot will kill the opponents' life.
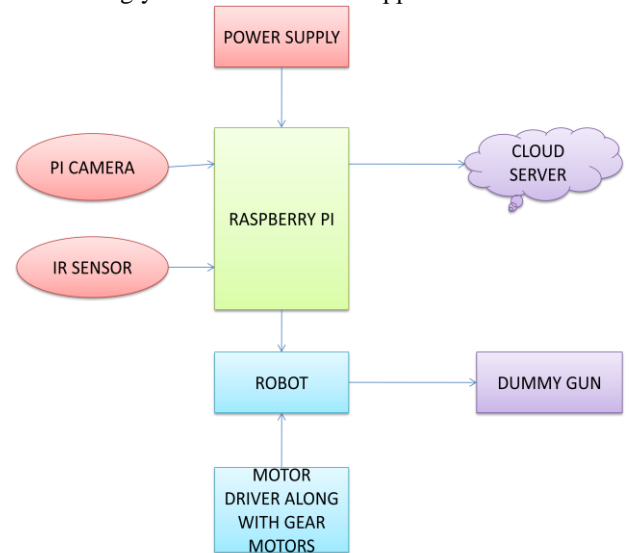

Fig 1. Proposed system

IV. SYSTEM IMPLEMENTATION

The System implemented using following hardware components:

A. Raspberry pi

Raspberry Pi is a credit-card sized computer manufactured and designed in the united kingdom by the raspberry pi foundation with the intension of teaching basic computer science to school student s and every other person interested in computer, programming and DIY-DO-IT yourself projects.

.

Fig 2 raspberry pi

Special Issue - 2018

International Journal of Engineering Research & Technology (IJERT)
ISSN: 2278-0181
NCESC - 2018 Conference Proceedings

B. Pi- Camera

Fig 3. Pi camera

In order to meet the increasing need of Raspberry Pi compatible camera modules. The ArduCAM team now released a revision C add-on camera module for Raspberry Pi which is fully compatible with official one. It optimizes the optical performance than the previous Pi cameras, and give user a much clear and sharp image .

C. IR Sensor

This device emits and/or detects infrared radiation to sense a particular phase in the environment. Generally, thermal radiation is emitted by all the objects in the infrared spectrum. The infrared sensor detects this type of radiation which is not visible to human eye.

Fig 4. IR Sensor

D. Motor Driver

It is a little current amplifier , the function of motor drivers is to take a low-current signal and then turn it into a higher-current signal that can drive motor.
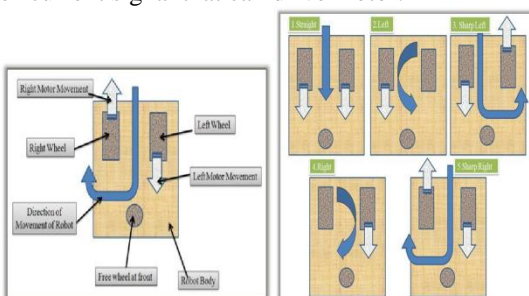

Fig 5. Motor Driver

E. Gear Motor

A small motor (ac induction, permanent magnet dc, or brushless dc) designed specifically with an integral (not separable) gear reducer (gear head). The end shield on the drive end of the motor is designed to provide a dual function. The side facing the motor provides the armature/rotor bearing support and a sealing provision

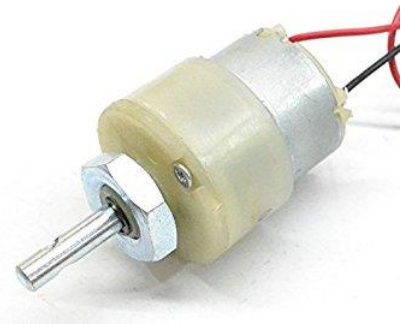through which the integral rotor or armature shaft pinion passes.

Fig 6. Gear Motor

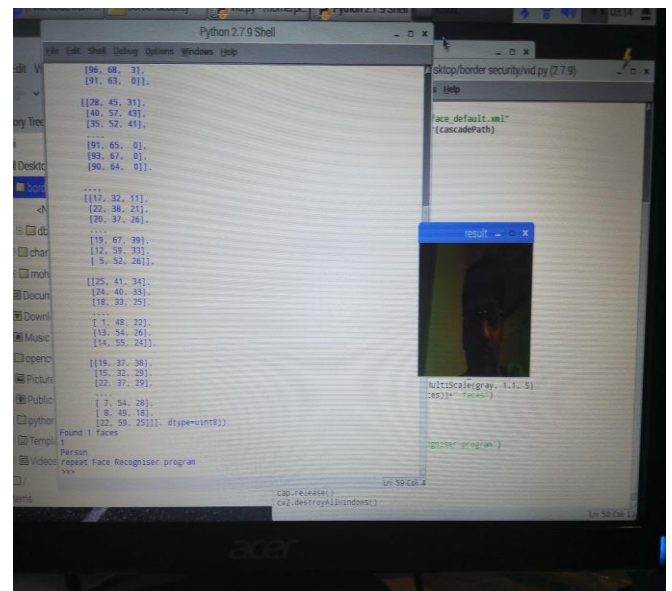V. RESULT

Fig 7. system representation

Fig 8. screenshot represents phase one detection

VI. CONCLUSION

The purpose of the proposed system is to provide a cost effective system for rescue of human in border. The proposed system uses a low cost sensor which is easily available. It is impossible for an individual to visit the border. So, in such situations, the proposed system can be useful.

Special Issue - 2018

International Journal of Engineering Research & Technology (IJERT)
ISSN: 2278-0181
NCESC - 2018 Conference Proceedings

VII. FUTURE SCOPE

In the future enhancement can be done by incorporating an IR camera that can exactly capture IR pattern emitted by human body. Furthermore, metal and bomb detector can be used to protect from possible damage.

VIII. REFERENCES

[1] Defence Security System: Border Security International Journal of Innovative Research in Science, Engineering and Technology, 2016

[2] Modeling of IoT-based border protection syste, Hamra Afzaal, Electrical Engineering and Computing Technologies (INTELLECT), 2017

[3] Border Security System, International Journal of engineering and research, 2017 ,KarthiKayan A,

[4] James N. K. Liu, M, Meng Wang, " iBotGuard: An Internet-Based Intelligent Robot Security System Using Invariant Face Recognition Against Intruder", IEEE Transactions on Systems, Man, & Cybernetics Part C: Applications and Reviews, Vol. 35, No.1 February,2005.

[5] Guangming Song et. al., "A Surveillance Robot with Hopping Capabilities for Home Security", IEEE Transactions on Consumer Electronics, Vol. 55,No.4,NOVEMBER,2009.

[6] Mohd.Mazidi, AT89S52 the 8051 micro controller and embedded systems.

[7] Embedded systems with 8051 by kenith j ayala

[8] Human Motion Detection Using Passive Infra Red Sensor K Sravani, Md Parvez Ahmed, N Chandra Sekhar, G Sirisha,V Prasad.

[9] Kenneth G, Eskildsen, Great Neak,"Method and apparatus for large signal detection in PIR application(2007)

[10] Larry Hurwitz,Alpine,"Apparatus and methods for generating alerts.(2010).

[11] Wouter dekort (2013) programming in C [online:www.junglee.com]

[12] Stevenf Barrett,Daniel J.Packand Mitchell a.Thornton(2007) Atmel AVR microcontroller primer; programming and interfacing online: www.amazone.in.