

IOT Based Surveillance Robot

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Abstract— In our proposed paper explain about the new approach of this technologies within the field of robot, for military monitoring, using the concept of IOT .replacing humans within the places of war, this robot detects unusual objects, and to live temperature and to detect presence of live humans, metals pieces within the field. The IOT based latest smart technology helps all connected devices to upgrade themselves in line with the disturbance within the surroundings and to be ready to adapt in any environment, we will see and correct the conditions of the sector .the robot are often controlled in any condition.

Index Terms: ARMLPC2148 microcontroller, metal detector, ultrasonic sensor, zigbee, wireless camera.

INTRODUCTION

Arobot is an electronic device that is able to activities based on program, thus replacing human efforts, providing highly desired results and easily overcoming the limitations of human beings In this paper, we focused on monitoring the activities in the war fields and places with no human reach.

The government of India invest large amount of money in military and security purpose and there are many border threats in places like Kashmir, Ladakh and terrorism threats in places like Mumbai. It is a human threat to investigate these places during these destruction. The military uses Daksh military recently in war fields.

One of the most advantage of thi s robot is it helps to stay the place in restraint by providing all time surveillance and also overcomes the downside of limited frequency range by using the concept of Internet of Things for receiving the information from the bot and also to manage the movement of the bot..Also these advantage being that the robot may be employed in automatic mode where the bot changes its direction when an obstacle is detected before of it with the help of ultrasonic sensors.

The night-sight camera provides the live streaming of the sensing element sensor placed under the robot. It

also sends the precise location of the robot with the assistance of GPS used.

RELATED WORK

[1]Here, Wai Mo MoKhaing, KyawThiha in his project focuses on movable spy robot with a foreign controller by using PIC 16F628A and PIC 16F877. The spy robot is created of a wireless camera, an antenna, batteries and 4 movable wheels. The 2 different PICs are accustomed remotely control along wireless system and to manage Spy robot. CCD camera is employed to capture information surrounding the robot. A 4 bits LCD display is mounted on remote controller to look at user command. To use the Spy robot within the dark area as night, the CCD is about up with LED that connected by wiring. oftenness modules signals are employed in wireless remote system for transmitting and receiving wireless logic signals to manage the motors of the Spy robot system. The three Brush DC motors and also the two L298N are involved in Remote Operated Spy Robot. L298N are wont to drive the comb DC motors respectively. during this paper, Remote Operated Spy Robot could be a small robot designed for spying, surveillances and inspection purposes.

[2] Here, AaruniJha, Apoorva Singh, RavinderTurna, SakshiChauhanin his project focuses on building a RF based spying robot attached with wireless camera which will reduce the human victim. This robot sends the signal to the bottom station using wireless camera. one amongst the main application of this project will be analyzed using android based smart phone which might be accustomed control the movement of the robot. The robot sends the signal to the RF receiver mounted on the robot via RF transmitter at the bottom station. With this feature the robot can transmit real time videos with vision

capabilities and can't be identified by the enemies in combat area.

[3] Here, Ghanem Osman ElhajAbdalla,T. Veeramanikandasamyin his project focuses on many of the military departments now utilize the robots to hold out risky jobs that can't be done by the soldiers. during this present work, a Raspbian software based spy robot platform with remote monitoring and control algorithm through Internet of Things (IoT)has been developed which is able to save human live, reduces manual error and protect the country from enemies. The spy robot system comprises the Raspberry Pi (small single-board computer), night-sight pi camera and sensors. the knowledge regarding the detection of living objects by PIR sensor is distributed to the users through the online server and pi camera capture the moving object which is posted inside the webpage simultaneously. The user up to the mark room ready to access the robot with wheel drive control buttons on the webpage. The movement of a robot is additionally controlled automatically through obstacle detecting sensors to avoiding the collision. This closed-circuit television using spy robot may be customized for various fields like industries, banks and shopping malls.

[4] Here, Tondarkar, Krishna Solanke, RohitJagtapin his project focuses on modern approach for surveillance at remote and border areas using multifunctional robot supported current IOT employed in defense and military applications. This robotic vehicle has ability to substitute the soldier at border area t provide surveillance. The robotic vehicle works both as autonomous and manually controlled vehicle using internet communication medium. This multisensory robot wont to detect presence of enemy capture it privately and provides the live streaming to the authorized person Surveillance is major role while we work in on border area for this there's robot for surveillance purpose. This paper presents a wise surveillance robot for military application by using Raspberry Pi for security purpose. An field Raspberry pi sends a wireless command which is received by Authorized person on website and accordingly robot moves. The Video Streaming is finished using Raspberry pi camera. The Raspberry pi programming is finished in

python language. The experimental result shows that the video streamed up to fifteen frames per second.

[5] Here,Ibrahim Adabara1, Kasiimbura Osbert2.in his project focuses onthe design approach of an Embedded Real-Time Security System supported Raspberry Pi for intruder observation that reinforces surveillance technology to produce essential security to our life and associated control. The proposed robotic unit is employed for video surveillance of remote place likewise as remotely control of the unit using Bluetooth as a medium. Raspberry pi serves a server similarly because the microprocessor for the system. An embedded web server creates a simple way for monitoring & controlling any device which is in a very remote place. The proposed security solution hinges on our novel integration of cameras and obstacle detector into the online application. Raspberry Pi operates and controls obstacle detector and pi camera for remote sensing and surveillance, streams live video and records it for future playback. This research is targeted on developing a closed-circuit television that helps the property owners to watch the place to avoid intruders by using pi camera and wireless Bluetooth technology for device.

[6] Here, S. P. Dhanure, SoumyaKumariin his project focuses on to hold out risky jobs the robots are used that can't be done by the soldiers. during this present work, a Raspbian operating system-based spy robot platform with remote monitoring and control algorithm through Internet of Things (IoT)has been developed which is able to save human live, reduces manual error and protect the country from enemies. The system comprises the Raspberry Pi (small single-board computer), camera, PIR sensor and shooting gun. The Raspberry Pi is that the brain of the system. Android app control the moving to a particular direction and camera for live streaming videos of required areas for tracing and attacking. and therefore the PIR sensor are activated rely upon external stimuli via IoT. The user is in a position to access the system with control buttons on the android app from room.

[7]Here A. Aashraya , P. Munaswamy in his project focuses on monitor the environment in various hazardous conditions and supply live video feedback. Basics of robotics like sensors and actuators, gives an

outline on robotic construction. The proposed system is additionally ready to capture real-time videos which are useful for surveillance for a selected person or area. Controlling of Robot is completed employing a Raspberry Pi3 processor. This robot is more well-off for military applications like surveillance of interested area. it'll provide tactical advantage during hostage situations or in hostile grounds. it's capable of walking on any surface and providing monitoring over a region. With the assistance of high-quality video transmission, the surveillance become simpler and it detect the warm temperature and also wont to reduce the hearth by using water sprinkler. Video quality is improvised within the proposed system. These will prove important in applications like robots for civil use and military robots.

[8]Here, Aishwarya K Telkar, Prof.BaswarajGadgayin his project focuses on surveillance robot which will reduce the casualties within the war field. The robot acts as surveillance robot to capture the intruders surrounding information before the intruder is attacked by the soldiers. The laser gun equipped on the robot aims to shoot the intruder on sight. the problems associated with short-range communication to manage the movement of the robot is overcome using an IoT technology. The robot movement may be controlled on an android phone by sitting anywhere from the world. This project comprises of 5 phases: controlling the Robot in manual mode using IoT technology or in automated mode via android/PC, Wireless night-sight camera live video streaming with audio communication, PIR and Metal detection sensors, GSM & GPS technology, and a Laser Gun. The execution begins when the Robot halts on the detection of the PIR sensor and detector sensor. The work aims to cut back the loss of life and achieve safety within the war field. The robot can perform multiple application like if any bombs are placed at public places this robot acts as a bomb detector robot using the detector sensor and also the location of the bomb detected is tracked using GPS. The robot are often employed in natural disaster like earthquake, if any human is trapped under the building is detected by employing a PIR sensor equipped on the robot.

[9]Here, Lavanya K N ,Ramya Shree Din his project focuses on implementing a true time closed-circuit television which functions a substitute for the humans in defence sector. The vision based interface functions by giving gestures to manage robot which overcomes the lacunae of speech recognition algorithms. This work consists of 4 stages i.e. capturing of the image, gesture recognition, navigation of robot, metal and fire detection. The implementation is achieved by stopping of the robot by either fire or metal detection. The impact of the work aspires at achieving more safety and reduced loss of lives within the battle field.

[10]HereP.Raja, SwapnilBagwarietal in his project focuses on a MASS (military assistance and surveillance system) that uses different style of sensor to watch the soldier like their location, health conditions, surroundings, sending data to base station, etc. being a wearable device it monitors the heart beat rate furthermore as send the respective data to the bottom station and by using GPS module the placement can even be monitored by military base station. Since it's wearable installation are going to be cost effective and can add an important pack load for soldier,

[11] Here, Aditya prakash, Raheewalambetal described a couple of simple military surveillance robot with the commands for moving front, back, right, left and stop are being received from the remote controller and accordingly the input is fed to the Raspberry pi 3 which makes the robot setup respond as per the instructions given. The Kinect sensor works sort of a camera with an extra feature of depth measurement i.e. it depicts the gap of object from itself by representing the article within the sort of gray scale values starting from 0 to 255 where 0 amounts to black which means the item is closer and 255 amounts to white which means the item farther.

[12]HereSiva karteekboliseti, Mohammad patwary, Mohamed abdel-maguidetal proposed RF sensing based target detector which is anticipated to administer an energy efficient solution to the matter of target detection under the sensing conditions. The sensor nodes are required to control in harsh sensing environments within the presence of clutter and interfering signals. employing a simple low

complexity target detector at the individual sensor nodes could also be considered where the sensor nodes are capable of constructing a preliminary decision before transmitting the info to the control centre. This reduces the frequency of information exchange between the sensor nodes and also the control centre thereby increasing the lifetime of the IoT. 70% reliability has been achieved.

[13] Here, Majdghareeb, Alibazzi, mohamadraad, shamihabdulnabietalin his project focuses on wireless robo pi for landmine detection as an occasional cost automated sensing element which will replace this human detectors within the mission of detecting and extracting mines in an exceedingly suspected area of land. This detector will wirelessly connect with a server to send the placement of detected mines or metal and captured image of land where it's found. Since the detector is raspberry pi based we are able to make it as iot based for further communication.

[14] Here, Widodo Budihartoetalin his project focuses on Tracked Robot with remote for Surveillance, the performance of the robot is in terms of the gap and therefore the capability to deliver video streaming from the output raspberry pi and a pair of 4 GHz Video transmitter. Experimental results with various distance show that the simplest distance for transmitting the commands no more than 20 meters. The sensor system is extremely cheap because it only uses 1 distance sensor. the common speed raspberry pi to display a video streaming is 33 fps that sufficient for surveillance. the most weakness of kind of ultrasonic sensor is that the interference between different sensors and therefore the limited ability to spot the obstacle

[15] Here, Andrea Claudi, Francesco Di Benedetto, Gianluca Dolcini, Luca Palazzo, Aldo Franco Dragonietalin his project focuses on mobile autonomous robot, called MARVIN, to be utilized in video surveillance applications. the most goal of the robot is to detect human faces within the monitored environment, and to autonomously move to stay a face within the exact center of the frame. The architecture of the robot is conceived to attain a decent trade-off between reactivity and accuracy. In terms of speed, the experiments showed that LBP is suitable as real-time face-detection algorithm,

processing one frame containing 6 faces in about 40 ms. The performances of ORB don't seem to be sufficient to recommend its use under the conditions of the reference scenario. In terms of accuracy, LBP with atiny low search window can provide an accuracy of about 73%, with a substantial penalty in terms of timing performances.

[16] Here, Change Zhengetalin his project focus es on mechanical design including a kind of miniature flexible driving mechanism, as Miniature autonomous surveillance robot BMS-1 for covert surveillance using set of sensors and so the system for tasks prefer to secretly enter into and conceal in potentially dangerous region and feed information back. It uses pyroelectric sensors that are designed specifically for detection of human motion. This light sensor is way suitable for detection of cover, because it's only sensitive to light and has low infrared and ultraviolet sensitivity without the help of optical filters. The output voltage of this sensor is sampled by the ADC module of the DSP controller in BMS-1. In our robot, the two facing upward photovoltaic sensors are outfitted on the two ends of BMS-1. this permits for detection of dark location of BMS-1.

Research gap

Limitation of this paper [1] it's no usb port and spy robot can move only straight backward direction and to look at object in dark/night isn't possible, the bot is tiny in size.

Limitation of paper [2] the system will be connected to on to internet by using zigbee, no simulation tool is required when software is employed

Limitation of paper [3] system has limitation which is more suitable for pretty much flat surface on which the robot can operate. This design wouldn't be suitable for rough terrain environments like rocky or hilly terrain thanks to their wheeled mechanisms.

Limitation of paper [4] In it's providing mostly used surveillance robots are wheel robot. The wheel based robots are more suitable for flat platform. With the event in wireless communication and internet, the videos captured by wheel robot are often seen remotely on computer or laptop.

The experimental result shows that the video streamed up to fifteen frames per second.

Limitation of paper [5] in their project they used driver IC L298N its used for forward and reverse direction with speed control dc motor .360 rotation movement out of the question here.

Limitation of paper[7] they used the most components of the robot are 8 Servo Motors, Raspberry Pi3 model it consumes more room, PIR sensor are active providing the externals stimuli is suitable ,instead of normal camera sight camera might be used.

In paper [9] the lack of the robot to rove within the rain. the dimensions and weight of the robot is further minimized by using innovative design and advanced material to create a robot.

CONCLUSION

The Robot model are often reported to create a robot whose motor movement and mode of operation, i.e automated as manual are controlled by employing a keil software version 4,that is wont to built IoT based application. The wireless vision camera is employed for video and also the live stream of the detector sensor placed under the robot, Zigbee modules are wont to transmit the information that has been collected by different sensors to the receiver transfer RF module. The robot proposed can reduce the loss of lifetime of a border areas and other locations where military service is required. With in the proposed project ultrasonic sensor is employed for obstacle detection. detector for landmine detection and a wireless camera(night vision) for surveillance. The further research is dole out to beat the restrictions pf the proposed robot like the robot will be equipped with interactive voice feedback and it's possible to put in ME(Medical Emergency) band within the robot to took after the health conditions.

REFERENCES

[1] Wai Mo Mo Khaing¹, Kyaw Thiha² Department of Mechatronic Engineering, Mandalay Technological University Mandalay, Myanmar International Journal of Science, Engineering

and Technology Research (IJSETR), Volume 3, Issue 7, July 2014

- [2] AaruniJha, Apoorva Singh, RavinderTurna, Sakshi Chauhan SRMSWCET, UPTU, India Journal of Network Communications and Emerging Technologies (JNCET) Volume 2, Issue 1, May (2015)
- [3] Ghanem Osman ElhajAbdalla, T. Veeramanikandasamy 2017 2nd IEEE International Conference On Recent Trends In Electronics Information & Communication Technology, May 19-20, 2017, India
- [4] Prof. S. A Joshi, AparnaTondarkar, Krishna Solanke, Rohit, Jagtap International Journal Of Engineering And computing ISSN:2319-7242 Volume 7 Issue 5 May 2018, Page No. 23939-23944
- [5] Ibrahim Adabara¹ , Kasiimbura Osbert², Enerst Edozie³, International Journal of educational and Applied Research (IJAAR) ISSN: 2643-9603 Vol. 3 Issue 7, July – 2019, Pages: 49-53
- [6] S. P. Dhanure , SoumyaKumari “IOT Device for The Tactical Military Environment Using Raspberry Pi “ ,International Journal of Future Generation Communication and Networking Vol. 13, No. 3s, (2020), pp. 682–688
- [7] A. Aashraya , P. Munaswamy Department of electronics and communication engineering Institute of Aeronautical Engineering, Hyderabad-500043, India European Journal of Molecular & Clinical Medicine ISSN 2515-8260 Volume 07, Issue 01, 2020
- [8] Aishwarya K Telkar Dept. VLSI and Embedded systems, VTU Proceedings of the Second International Conference on Inventive Research in Computing Applications (ICIRCA-2020) IEEE Xplore Part Number: CFP20N67-ART; ISBN: 978-1-7281-5374-2
- [9] JigneshPatolia, Haard Mehta, Hitesh Patel, Patel.V.T. “Arduino Controlled War Field Spy Robot Using Nightvision Camera And Android Application”. Department of Electronics And Communication of Engineering, Charotar University of Science And Technology, Changa, Anand, Gujarat - 388421,India.(2015)
- [10]Manish Yadhav, Vibha Singh, Vinay Uniyal, Manish Singh. “Smart Aero Amphibian Surveillance System” Department of Electronics

Engineering, Thakur College of Engineering and
Technology, Mumbai, India (2016).