

# Surveillance Robot

Vishwas.G<sup>1</sup>, Soma Shekhar.N<sup>2</sup>, Lavanya.K<sup>3</sup>, S. Sowndeswari<sup>4</sup>

<sup>1,2,3</sup>UG Students, Dept. of ECE, Sambhram Institute of Technology, Bangalore

<sup>4</sup>Assistant Professor, Dept. of ECE, Sambhram Institute of Technology, Bangalore

Submitted: 10-02-2021

Revised: 20-02-2021

Accepted: 26-02-2021

**ABSTRACT:** The robot is basically electro-mechanical machine or device that is controlled either by computer program or with electronic circuit to perform variety of physical tasks. With the gradual development in technology, scientists come up with new ideas and inventions of robots. In the today's life, robots are becoming indispensable part of human life. The robotic technology also provides automation in hospital, office and factory. Besides automation this technology also used in Defense forces, Entertainment, Space exploration, Security systems and many dangerous mission executions.

**KEYWORDS:** Robot, Arduino Mega, Surveillance, Security, UGV (Unmanned Ground Vehicle).

## I. INTRODUCTION

The robot presented will be combination of multiple technologies integrated in one unit. The robot will be controlled by a PC software program using Wi-Fi network; thus, enabling multiple robotic control system in the same environment. The robot will accept these navigational commands from the Wi-Fi network and will perform action according to them. There will be various sensors mounted on the robot so that operator can get better idea of the environment. The sensor data will be transferred to the PC again using the Wi-Fi network. PC software will continuously plot all the sensor values in real time graphical manner on the screen. A web cam mounted on the bot will give live video for easy navigation. User can capture photos of desired objects. There will also be a robotic arm mounted on the robot so that operator can pick, escort and place various objects in the surrounding area. One of the most important features of the robot is that it will be able to calculate and send the GPS co-ordinates of itself in terms of Latitude and Longitude. These co-ordinates will be transferred to the monitoring PC whenever requested by the operator. On PC user can see exact location of the robot on Google map in real time.

## II. LITERATURE SURVEY

### Surveillance Robot for Military Application.

S. A Joshi, Aparna Tondarkar, explain that in the modern approach for surveillance at remote and border areas using multifunctional robot based on current IOT used in defense and military applications. Due to this robotic vehicle, we can replace the soldier at border area to provide surveillance. Using Internet communication this robotic vehicle can operate on both automatic and manual mode.

This multisensory robot used to detect presence of enemy capture it in camera and give the live streaming to the authorized person. Surveillance is major role while working on border area for this there is robot for surveillance purpose. This paper presents a smart surveillance robot

for military application by using Raspberry Pi for security purpose. A field Raspberry Pi sends a wireless command which is received by Authorized person on web Page and accordingly robot moves. In this system Raspberry pi camera is used for video streaming.

The Raspberry pi programming is done in python language. The experimental result shows that the video streamed up to 15 frames per second.

## III. OBJECTIVES OF PROPOSED SYSTEM

The purpose of the project is to meet the requirement of the present industrial and commercial scenario. The prime objective was to implement the project with the use of latest available and developed techniques and components such as embedded systems and microcontrollers which can perform well even with compact hardware and also increases accuracy. It provides flexibility reliability and ruggedness. The project being made is such that along with its efficiency and other factors like future developments, cost and availability of the component is taken into consideration.

#### IV. PROPOSED METHODOLOGY

##### Block Diagram

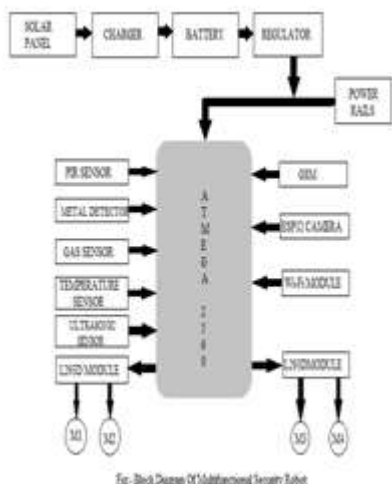


Figure 1: Block Diagram of Surveillance Robot

#### V. ADVANTAGES

- Uses Renewable sources of energy.
- Consistency of performance.
- Wide range of communication.
- Ease of use.

#### VI. DISADVANTAGES

##### Explanation of Blocks

##### Sensor Module

The Sensor module comprises of various detect intruder, harmful gases, fire and bomb remote areas. PIR Sensor is used to detect movement ZOR (Zone of Region) by sensing emitted by human. Metal Detector based on the electromagnetic induction to detect metallic objects surrounding. Gas Sensor detects various harmful Propane and iso-butane when the gases voltage level. Temperature Sensor LM35 integrated sensor R2 686 used to detect hazardous weather conditions and fire at restricted.

##### Obstacle Detection Module

The autonomous robot is able to find the path by using obstacle detection module. The ultrasonic sensor integrated with infrared sensor used to detect obstacles, as the ability of ultrasonic sensor to detect nearby objects is scarce as compared to infrared sensor. Ultrasonic sensor detects object by sensing the echo signal which are received back after striking with object and also determine distance of obstacle by evaluating the time between transmission and reception of object.

##### Arduino Mega 2560

The whole robot functionality is controlled by this module. As the temperature sensor and Gas sensor provides the analog output, so due to inbuilt 16-bit ADC, ATmega microcontroller does not require additional ADC for digital data output. It controls the vehicle in both automatic and manual mode effectively.

##### Wi-Fi Module

With the popularity of Wi-Fi IOT devices, there is an increasing demand for low-cost and easy-to-use Wi-Fi modules. ESP8266 is a new player in this field: it's tiny (25mm x 15mm), with simple pin connections (standard 2x4 pin headers), using serial TX/RX to send and receive Ethernet buffers, and similarly, using serial commands to query and change configurations of the Wi-Fi module. This is quite convenient as it only requires two wires (TX/RX) to communicate between a micro-controller and Wi-Fi, but more importantly, it offloads Wi-Fi-related tasks to the module, allowing the microcontroller code to be very light weighted.



Figure 2: Expected outcome of the project

#### VII. EXPECTED OUTCOME

In our project, the robot is designed to move by our command and also on its own according to the command given by the program. In this prototype project, we designed in such a way that this robot can be moved anywhere and it can get the information of particular place. It is easy to detect any faults or dangers in the industry. It leads easy process without interaction of human. An alerting message will be sent to a prescribed SIM using GSM module. This project is very much useful in the place where a human cannot go into the places like ground canals, smoke-oriented caves and this project is very much useful in such situations.

#### VIII. SUMMARY

In mechanical robots, we have experienced the nuts and bolts of mechanical

autonomy and completely looked into the parts of the current innovation and its highlights and also its benefits and bad marks. Mechanical autonomy is a wide field in which perpetual number of machines can be made and worked effectively. The robot itself is a machine made for security and reconnaissance purposes. Robots can be of any shape and performing multiple tasks. Fundamentally, every robot is intended for some particular errands for which it has been modified. Today we have many covert agent robots like metal locator, human identifier, night vision, and forth and are working effectively. There are numerous more extraordinary sorts of robots existing in this day and age yet they require some up degree as like all the current hardware innovation require it. One of the elements that we have seen is that the power utilization and the wellspring of intensity for the robots isn't exactly reasonable.

#### REFERENCES

- [1]. Zadid Shifat, A. S. M., Md Saifur Rahman, Md Fahim-AlFattah, and Md ArifurRahman, "A practical approach to microcontroller based smart phone operated robotic system at emergency rescue scheme" In Strategic Technology (IFOST), 2014 9th International Forum on, pp. 414-417. IEEE,2014.
- [2]. Pavithra, S., and S. A. Siva San kari. "7TH sense-a multipurpose robot for military" In Information C communication and Embedded Systems (ICICES), 2013 InternationalConference on, pp. 1224-1228. IEEE,2013.
- [3]. T Kaur, DILIP KUMAR, "Design of Cell Phone Operated Multipurpose Security Robotfor Military Applications using Solar Panel."
- [4]. Shrivastava, Prasun, Abeer Gupta, Akash Singh, and Amritanshu Shrivastava, "DTMFBased SecurityRobot-SECBOT."
- [5]. Jain, Khushwant, and Vemu Suluchana. "Design and Development of Smart Robot Carfor Border Security." International Journal of Computer Applications76, no. 7,2013.
- [6]. Mohammad, Tarek. "Using ultrasonic and infrared sensors for distance measurement."World Academy of Science, Engineering and Technology 51(2009):293-299.
- [7]. Harindravel Letchumanan. "Mobile Robot Surveillance System with GPSTracking." (2013).
- [8]. Arroyo, A. Antonio. "Autonomous navigation and Obstacle Avoidance Vehicle.
- [9]. Da Xu, Li, Wu He, and Shancang Li. "Internet of Things in industries: A survey." Industrial Informatics, IEEE Transactions on 10.4 (2014):2233-2243.
- [10]. Thomas R. Kurfess, "Robotics and Automation Handbook", 2004, Taylor & Francis Group, CRC Press, UK.



**International Journal of Advances in  
Engineering and Management**

**ISSN: 2395-5252**



# IJAEM

**Volume: 03**

**Issue: 02**

**DOI: 10.35629/5252**

**[www.ijaem.net](http://www.ijaem.net)**

**Email id: [ijaem.paper@gmail.com](mailto:ijaem.paper@gmail.com)**