



ISSN (Print) : 2320 – 3765
ISSN (Online): 2278 – 8875

International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Website: www.ijareeie.com

Vol. 7, Issue 3, March 2018

Rescue Bot using Wireless Sensor Network

R.Sharda¹, Mousam Sharma², Priyanshi Sahu³, Ankita Sikarwar⁴, Karishma Ilamkar⁵,
Hitesh Mandavi⁶

B.E Student, Dept. of Electrical & Electronics Engineering, Bhilai Institute of Technology, Durg, India^{1,3,4,5,6}

Assistant Professor, Dept. of Electrical & Electronics Engineering, Bhilai Institute of Technology, Durg, India²

ABSTRACT: The unpredictable magnitude and scale of natural and human elicited disasters have motivated the rescue groups to hunt for newer and additional innovative equipment to reinforce their efficiency. These groups are invariably looking for additional powerful and quick rescuing systems. This paper proposes a Mobile robot supported Wireless Detector Network (WSN) that is intended for human existence & more; detection in an unmanned space will be done solely by an automatic system. The paper conjointly highlights the benefits of smartphone-controlled robots over remote-controlled robots, with modifications the purposed model may also be employed in coal mines and nuclear plants to discover outflow of gases, temperature and wetness level wherever human search is with risky and dangerous. The major objective of this Paper is to rescue individuals from the adverse condition.

KEYWORDS: Wireless Sensors, Smart Sensing, Efficient Communication, System Security.

I. INTRODUCTION

There is many various catastrophe in natural and man made disaster: earthquake, flooding, cyclone and that they cause completely different area like folded building, landslide or crater. Throughout these emergency things, and specially in urban disaster, many various individuals area unit deployed (policeman, hearth fighters and medical assistance). they have to collaborate to avoid wasting lives, defend structural infrastructure, and evacuate victims to safety. In these things, human rescuers should create fast choices below stress, and check out to induce victims to safety usually at their own risk. they have to gather confirm the placement and standing of victims and also the stability of the structures as quickly as potential so medics and firefighters will enter the area and save victims. All of those tasks area unit performed principally by human and trained dogs, usually in terribly dangerous and risky things. this can be why since some years, mobile robots are projected to assist them and to perform tasks that neither humans dogs nor existing tools will do. For this project, we'll targeted solely on robots which can add a disaster atmosphere of non-natural structure, like folded buildings. they're known as Urban Search And Rescue (USAR) robots.

II. PROBLEM STATEMENT

The main problem encountered during any rescue operation of an earthquake or any natural disaster is to find the dead bodies or living beings surviving deep beneath the detritus. Human rescuers have very short time (48 hours) to find trapped victims in a collapsed structure otherwise the chance of finding victims still alive is nearly zero. Detection by rescue workers becomes time consuming due to unavailability of machine and manpower and also due to the vast area that gets affected it becomes more difficult. This is why since some years mobile robots have been proposed to help them and to perform tasks that neither humans/dogs nor existing tools can do. So the project proposes a mobile rescue robotic that moves in the Disasters area and helps in identifying the alive people and rescue operations.

III. LITERATURE REVIEW

Looking over the AI literature for the past thirty years, USAR has continuously been talked regarding as a decent application for AI. academic Shigeo Hirose within the Tokyo Technical Institute was most likely the primary person to



ISSN (Print) : 2320 – 3765
ISSN (Online): 2278 – 8875

International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Website: www.ijareeie.com

Vol. 7, Issue 3, March 2018

create robots specifically for USAR. Robin tater within the University of South American state seems to be the primary to own a sustained target AI for USAR AI. (Mills, C, 1995) fortuitously, several researchers are becoming concerned currently, each due to the terrible earthquakes in Turkey and Taiwan and since of the challenge. academic Satoshi Tadokoro in Kobe University became concerned once one amongst his graduates was at bay for many days throughout the Kobe earthquake. (Mills, C, 1995) a contest known as RoboCup Rescue is devoted to encouraging researchers to develop intelligent robots for USAR [5].

Quality work has been tired the sector of artificial intelligence. They came into existence within the early twenty first century however since then huge enhancements are created in its conception, style supported purpose of use. varied rescue robots are developed and a few of those ar – CRASAR (Centre for Robot-Assisted Search and Rescue) in University of South American state. This golem was used for initial time in real conditions on eleventh Sep 2001 within the World Trade Centre disaster. totally different sensors like millimetre wave radiolocation for measurement distance, a color CCD camera for vision and a forwardlooking infrared camera for the human heat detection were utilized in it [7].

Burion given a project that provided a device appropriate for human detection for the USAR robots. It evaluated many styles of devices for sleuthing humans reminiscent of pyro electrical sensor, USB camera, microphone, and IR camera. The pyro electrical device was wont to notice the body radiation. The USB camera was used for motion detection. A mike was used for long length and high amplitude sound detection. The IR camera was wont to notice humans by their heat image. the most plan was to notice a amendment within the image scene by checking the values of the pixels. many pictures for the scene were noninheritable and deducted from one another to get if a motion has occurred. The used technique was fairly economical in sleuthing the victims. But still, the golem wasn't absolutely autonomous and was addicted to the operator[8].

Bahadori presents associate degree analysis of techniques that are studied within the recent years for body detection (HBD) via visual data. the main focus of this work is on developing image process routines for autonomous robots operational fordetecting victims in rescue environments. The paper each discusses issues arising in body detection from visual data and describes the strategies that ar a lot of capable be applied during a rescue situation. Finally, some preliminary experiments for such strategies in recognizing rescue victims arreported .

The project proposes a mobile rescue golem that moves within the disaster, earthquake prone space and helps in characteristic the live folks, eviscerate folks, location and rescue system operations. thus thanks to the on timely detection in natural calamities this could save precious life & nice loss even while not the assistance of huge variety of rescue operators. The projected system consists of a mobile rescue golem, computer management Module. The mobile rescue golem consists of 4 units that ar specifically device unit, Micro-controller, Camera unit, Motor driver unit, Transmission unit. The device unit should be directly interfaced to the micro-controller. The device devices monitor current readings and sends knowledge to the Micro-controller. The controller circuit is to blame for transmission this data. Controllarsar designed at hardware level. The 2.4GHz RF module is interfaced with the microcontroller via the quality interface. These data's ar updated by the PC/SERVER in order that rescue team will read the readings real time and camera is employed to notice motion & live mental image of important scenario of the disaster

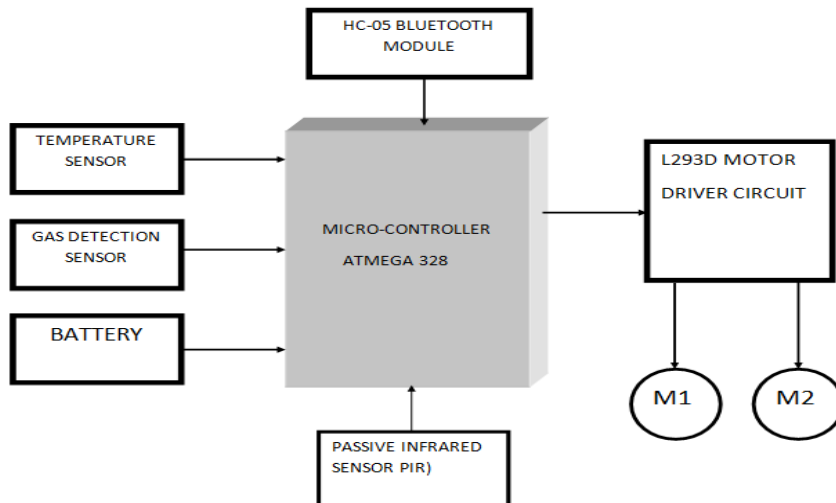
International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering

(A High Impact Factor, Monthly, Peer Reviewed Journal)

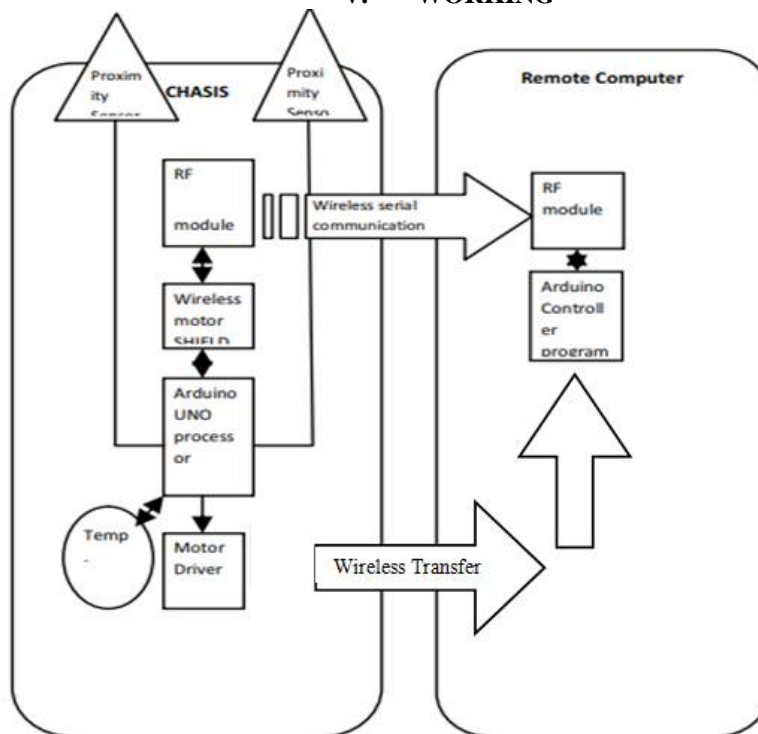
Website: www.ijareeie.com

Vol. 7, Issue 3, March 2018

IV. BLOCK DIAGRAM



V. WORKING



The architecture diagram shows however, the robot is connected to the remote pc. It shows the interior design of our project. The arduino [6] processor are connected to the motor driver liable for the movement of the robot. The RFpro are connected to the Arduino defend which can be connected to the Arduino processor. The automaton are started and



International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Website: www.ijareeie.com

Vol. 7, Issue 3, March 2018

checked if it's operating properly and if it's not operating, we'll check what the matter is and create changes consequently. the particular operating within the automaton is as follows: we've the graphical user interface connected to the HyperTerminal. The HyperTerminal sends price through serial communication to the COM ports within which communications happen via USB. The USB output is reborn to serial output exploitation USB to serial converter. The output of the interface consists of nine pins, however the input of RFproconsists of solely three pins particularly, RX, TX and GND. For this we have a tendency to use nine pin to three pin converter and it's connected to Rf professional. At identical time the RFpro module is additionally interfaced to the arduino automaton defend that is interfaced to arduino UNO board wherever the program is preloaded. supported the values sent tho' the hyperterminal the switch cases among the program selects the actual action. within the mean whereas there square measure sensors that square measure interfaced to the arduino automaton defend that senses for its explicit application and can send an output to the UNO board. supported these outputs, the ensuing actions are chosen and in some cases relay message are flashed on the laptop

VI. SYSTEM DESCRIPTION

1. ATMEGA328 - Atmega328 has 32 KB of flash memory for storing code (of which 0.5 KB is used for the bootloader), 2 KB of SRAM and 1 KB of EEPROM and operates with a clock speed of 16MHz. This empowers system designer to optimize the device for power consumption versus processing speed.
 - High performance and lower power microcontroller.
 - Programmer friendly.



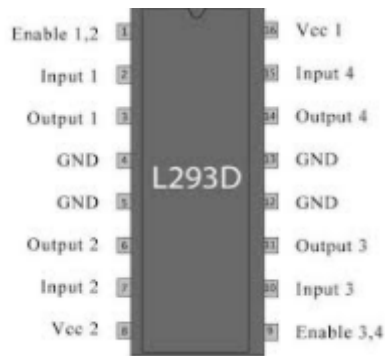
2. Motor Driver L293D - L293D is a typical motor driver which allows DC motor to drive in both clockwise and anticlockwise direction. L293D is a 16-pin IC which can control a set of two DC motors simultaneously in any direction. It is a dual H-bridge motor driver integrated circuit. L293D has an output current capability limited to 600mA per channel with peak output current limited to 1.2A, sufficient enough to drive a 100rpm motor. An internal sensor senses its internal temperature and stops driving the motor the motor if the temperature crosses a set point which implies that the over temperature protection also built into the IC.

International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering

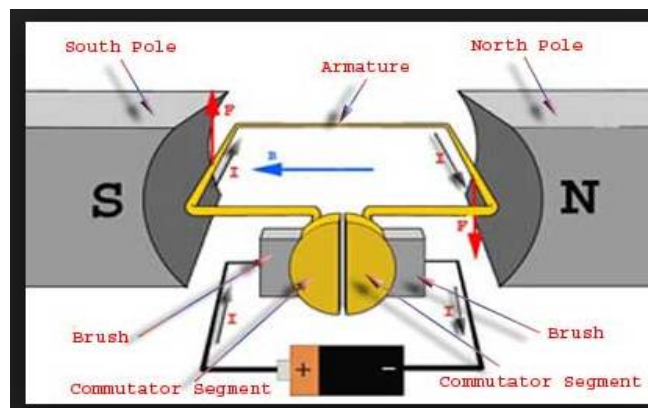
(A High Impact Factor, Monthly, Peer Reviewed Journal)

Website: www.ijareeie.com

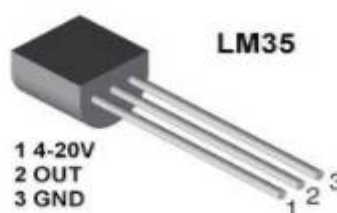
Vol. 7, Issue 3, March 2018



3. DC Motor - A DC motor is any of a class of electrical machines that converts direct current electrical power into mechanical power. The most common types rely on the forces produced by magnetic fields. Nearly all types of DC motors have some internal mechanism, either electromechanical or electronic; to periodically change the direction of current flow in part of the motor. Most types produce rotary motion; a linear motor directly produces force and motion in a straight line.



4. Temperature Sensor - Temperature Sensor is a precision IC temperature sensor with its output proportional to the temperature (in °C). The sensor circuitry is sealed and therefore it is not subjected to oxidation and other processes. With LM35, temperature can be measured more accurately than with a thermistor. It also possess low self heating and does not cause more than 0.1 °C temperature rise in still air. The operating temperature range is from -55°C to 150°C.



International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Website: www.ijareeie.com

Vol. 7, Issue 3, March 2018

5. PIR Sensor -The operation principle of PIR sensor is to detect the thermal variation in its detection region. We test several scenarios and record the response of the PIR sensor while the human or robot moves under its detection region.



6. HC-05 Bluetooth Module -Bluetooth is a wireless technology standard for exchanging data over short distances from fixed and mobile devices, and building personal area networks. The HC-05 Bluetooth Module has 6 pins – Vcc, GND, TX, RX, Key, and LED. This module is capable of communicating with PC, mobile phone or any other Bluetooth enabled device. It is interfaced with the microcontroller.



7. Servometer-A servomotor is a rotary actuator that allows for precise control of angular position, velocity and acceleration. It consists of a suitable motor coupled to a sensor for position feedback. It also requires a relatively sophisticated controller, often a dedicated module designed specifically for use with servomotors.
8. Buzzer- A buzzer or beeper is an audio signalling device, which may be mechanical, electromechanical, or piezoelectric. Typical uses of buzzers and beepers include alarm devices, timers and confirmation of user input such as a mouse click or keystroke
9. GPS – It is a global navigation satellite system that provides geolocation and time information to a GPS receiver anywhere on or near the Earth where there is an unobstructed line of sight to four or more GPS satellites.
10. GSM Module – GSM/GPRS module is used to establish communication between a computer and a GSM-GPRS system. Global System for Mobile communication (GSM) is an architecture used for mobile communication in most of the countries. Global Packet Radio Service (GPRS) is an extension of GSM that enables higher data transmission rate



International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Website: www.ijareeie.com

Vol. 7, Issue 3, March 2018



11. Gas Detector- A gas detector is a device that detects the presence of gases in an area, often as part of a safety system. This type of equipment is used to detect a gas leak or other emissions and can interface with a control system so a process can be automatically shut down. A gas detector can sound an alarm to operators in the area where the leak is occurring, giving them the opportunity to leave. This type of device is important because there are many gases that can be harmful to organic life, such as humans or animals.

VII. ADVANTAGES OF RESCUE BOT

- A. Used in Rescue as well as Industrial application.
- B. Life and Health saving operations.
- C. Connectivity with android, which has maximum no of modules, makes it easy to use for anyone.
- D. Cheap and light weight.
- E. This project is easy to use with multiple operated tasks.
- F. This can be controlled remotely.
- G. Does not require manpower.

VIII. APPLICATIONS

- In Domestic Use: This project can be used at homes for many purposes like picking up and placing some objects from one to other.
- In Spying Operations: This robot can help in spying operations. The object recognition and android control makes it Hi-Fi.
- For Handicapped People: This project can help the handicapped people especially those who had lost their feet unfortunately.
- Robo Races: The tilt control of robots can be used in robo races which will be revolutionary.
- Military Application and Hostage Rescue

IX. CONCLUSION AND FUTURE SCOPE

The goal of this project was to produce a sensing element suite for human detection within the urban disaster setting. the combination of those sensors on the prevailin robot at Carnegie mellon and their analysis to notice victims was the second a part of the project. several researches were done to survey the progressive in USAR AI with special importance on sensors for victim detection. an inventory of all the presently offered sensing elements was established to understand which type of sensor it absolutely was attainable to use for victim detection. For our application and compare to existing project, the subsequent sensors were chosen with lowcost and light-weight as main criteria: USB camera with build-in electro-acoustic transducer, pyroelectrical sensing element and Infrared camera. the longer term work would be to enhance detection having additional reliable confidence perform for every sensing element and



ISSN (Print) : 2320 – 3765
ISSN (Online): 2278 – 8875

International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Website: www.ijareeie.com

Vol. 7, Issue 3, March 2018

improve the selection of confidence price. to possess a far better quality of human detection, it'd be a decent resolution to feature a protracted distance sensing element. Finally, the foremost difficult half would be to maximise the autonomy of the golem to limit user attention on that.

REFERENCES

- [1] Arvind Kumar Saini¹, Garima Sharma², Kamal Kishor Choure³, “BluBO: Bluetooth Controlled Robot,” International Journal of Science and Research (IJSR) National Conference on Knowledge, Innovation in Technology and Engineering (NCKITE), 10-11 April 2015, pp. 325-328S.
- [2] Arpit Sharma¹, Reetesh Varma², Saurabh Gupta³ and Sukhdeep Bhatia⁴, “Android Phone Controlled Robot Using Bluetooth” IJEEE ISSN 0974-2174, Volume 7, Number 5 (2014), pp. 443-448)
- [3] M.Selvam¹, “Smart phone based robotic smart phone based robotic” IJRET Volume: 03 Issue: 03, Mar-2014, pp. 229-232.
- [4] Ritika Pahuja¹, Narender Kumar², “Android Mobile Phone Controlled Bluetooth Robot Using 8051 Microcontroller” IJSER, Volume 2 Issue 7, July 2014, Paper ID: J2013324, pp. 14-17.
- [5] Aniket R. Yeole¹, Sapana M. Bramhankar², Monali D. Wani³, Mukesh P. Mahajan⁴, “Smart Phone Controlled Robot Using ATMEGA328 Microcontroller”, IJIRC Vol. 3, Issue 1, January 2015, pp. 352-356
- [6] Aiman Ansari ^{*1}, Yakub Ansari^{*2}, SaquibGadkari^{*3}, Aarti Gokul^{#4}, “Android App Based Robot, IJCSIT, Vol. 6 (2) , 2015, pp.1598-1600
- [7] AritaDey ¹, Akash Pal ², Sayantan Nandi ³, Lusika Roy ⁴, “Three way controlled android Smartphone based robotic vehicle via Bluetooth”, IJARCCCE, Vol. 4, Issue 9, September 2015, pp. 212-216.
- [8] Muhammad Gulfam¹ and Mirza WaleedIftikharBaig², “WG11 Android based Surveillance Robot Control”IJMSE, Vol. 3, March 2015, pp. 17-22