

Robotic System for Military Applications & Real Time Validations

R.Madhuri

P.G. Scholar (M. Tech),
Department of ECE,

Modugula Kalavathamma Institute of Technology for
Women, Rajampet, Kadapa District.

R.Aruna

Assistant Professor,
Department of ECE,

Modugula Kalavathamma Institute of Technology for
Women, Rajampet, Kadapa District.

ABSTRACT:

This paper represents the design, development and validation of metal based autonomous robotic system for military application. It is well known fact that, most of the tasks in military applications are more dangerous than others. For example, walking through minefields, detecting and deactivating unexploded bombs or clearing out hostile buildings, are some of the most dangerous tasks a person is asked to perform in the line of duty. These tasks can be solved by an autonomous robot. But, complete autonomous robot which can perform varieties of tasks is still under development. Therefore researchers all over the world work towards the design and development of such robots, so as to simplify our works in various fields. The initial step towards the complete autonomy along with remote control of a robot is the design and development of obstacle avoidance and path planning.

Keywords:

ARM Controller, GSM, Sensor Interface Device.

1.1 INTRODUCTION:

Today's world enemy warfare is a important factor in any nation's security. The national security mainly depends on army (ground), navy (sea), air-force (air). The most important and vital role is played by the army soldiers and ground troops. There are many concerns regarding the safety of these soldiers and the artillery. As soon as any army enters the enemy lines it is very vital for the army base station to know the strategic planning of enemy. One of the main concerns is the mines that are laid by the enemy on the way. Many brave soldiers are killed without fighting a war due to these mines. so, it is very important to locate and identify the mines before they cause any damage in our project we have come up with an idea of developing a military unmanned vehicle

which will scan the enemy area for any mines before the army could enter .as soon as a mine is located it sends the location (longitude and the latitude) with the help of GPS and sends it via the GSM. The coordinator GSM received and fed to the Pc. And front end visual basic s/w instantly shows the location of the mine on the map. Along with metal/bomb detection the system also equipped with PIR sensor, Obstacle sensor and vibration sensor to make system more efficient.

1.2. PROJECT OVERVIEW:

An embedded system is a combination of software and hardware to perform a dedicated task. Some of the main devices used in embedded products are Microprocessors and Microcontrollers. Microprocessors are commonly referred to as general purpose processors as they simply accept the inputs, process it and give the output. In contrast, a microcontroller not only accepts the data as inputs but also manipulates it, interfaces the data with various devices, controls the data and thus finally gives the result.

This project is mainly used for mine detection in order to protect from mine in many application such as navy, air force Etc. This system will configured to detect the mines using a vehicle controlled with wireless technology with a encrypted language. Mines detection and transmission is needed more security data transmission technique. For that reason we used a better encrypted algorithm in our application to protect data while transmission.

1.3. OBJECTIVES OF PROJECT:

The project consists of mainly 2 parts:

- Buggy Unit
- Army Base Unit

1.3.1. Buggy Unit:

This section consists of dc motor based vehicle carrying a metal detector for detecting mines and sensors. This vehicle will scan a per-determined area under consideration. As soon as any mine is detected the buggy stops and sounds an alarm indicating the presence of buggy. Then the buggy logs the longitude and the latitude of that place from GPS to get the exact location of mine and then it transmits these co-ordinates wirelessly through GSM.

1.3.2. Army Base Unit:

This section receives the co-ordinates and sends it to pc. On pc we have visual basic software which is a graphical user interface. The s/w then displays these co-ordinates on the map. We use encryption-decryption technique to make the data transmission secure.

2. RELATED WORK:

“The landmine is eternally prepared to take victims.” It is true that the forgotten landmines are taking the lives of civilians every now and then. Thus, different countries use different methods to deal with buried landmines which possess potential danger to the lives of its own civilians. The most commonly used methods are as followed.

Probing the ground:

For many years, the most sophisticated technology used for locating landmines was probing the ground with a stick or bayonet. Soldiers are trained to poke the ground lightly with a bayonet and search for buried mines.

Metal Detectors:

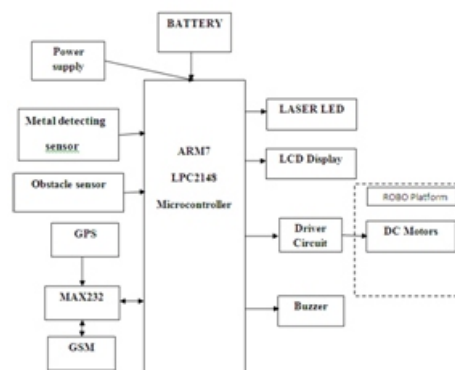
The detectors try to discover a buried mine by sensing the metal components inside the mines.

3. PROPOSED METHOD:

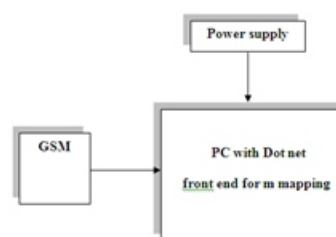
here the block diagram of the project and design aspect of independent modules are considered.

3.1 BLOCK DIAGRAM:

Transmitter section:



Receiver Section



Security is the first priority in today’s unsecured life. In existing system used to design a robotic system for military applications using zigbee technology. But in this project to control and monitoring and detecting objects by using GSM technology. Here in this project robot is controlled through PC. The purpose of the project is to implement a system in military areas and also to monitor the locations by using cam which is connected to robot. In this project consists of two sections one is transmitter section and other one is receiver section. The instructions are such as left, right, front, back are processed and that any instruction once person giving then automatically robotic controlling by own if when any obstacles, metals can be detected and also giving message through GSM. If any bombs/ dangerous things can be detected then robot gives sms to pc and after controller gives sms to robot please shoot it that dangerous things. This information is processed and is sent to the receiver via wireless. controller will process this data and it will control the robot direction according to the instruction. At initially controller give instruction to the robot and next automatically directions changing when any metals/obstacles obtained. similarly camera directions also controlled by their own. In the present days automated systems have less manual operations, flexibility, reliability and accurate.

Due to this demand every field prefers automated control systems. Especially in the field of electronics automated systems are giving good performance and this is realized by making use of GSM technology for communication. Most GSM networks operate in the 900 MHz or 1800 MHz bands. Some countries in the Americas use the 850 MHz and 1900 MHz bands because the 900 and 1800 MHz frequency bands were already allocated.

APPLICATIONS:

- » Military
- » War fields
- » mines

ADVANTAGES:

- » Works in Auto and manual modes
- » Provides the information with location details
- » Fast and secure

4. RESULT :

The proposed system was fully developed and tested to demonstrate its feasibility and effectiveness. The screenshots of the smart home app developed has been presented in Figure bellow.



Fig:Robot Section



Fig:remote monitoring and control section

5. CONCLUSION :

This project is mainly used for mine detection in order to protects from mine in many application such as navy, air force...Etc. This system will configured to detect the mines using a Vehicle controlled with wireless technology with an encrypted language. Mines detection and transmission is needed more security data transmission technique. For that reason we used a better encrypted algorithm in our application to protect data while transmission. Detecting mines and protect by our self with using a new generation technology which gives more are more advantages in current world.

6. FUTURE SCOPE:

The project "GPS Based Mine Detector using ARM7" By connecting a wireless camera to the Vehicle, then we can know the status of the Vehicle in our personal computers and also android mobile phones using Wi-Fi, GPRS technologies. We can use this Vehicle at so many fields and we can use to handle so many situations in real time.

REFERENCES:

- [1] Hai Liu, Miodrag Bolic, Amiya Nayak, Aug – 2008, "Integration Of Rfid And Wireless Sensor Networks".
- [2] Harish Ramamurthy, B.S. Prabhu And Rajit Gadhireless, April – 2007, "Wireless Industrial Monitoring And Control Using A Smart Sensor Platform".
- [3] Luigi Atzoria, Antonio Iera b, Giacomo Morabito, May – 2010, "The Internet Of Things: A Survey".
- [4] M. T. Lazarescu, "Design of a WSN platform for long-term environmental monitoring for IoT applications," IEEE J. Emerg. Sel. Topics Circuits Syst., vol. 3, no. 1, pp. 45–54, Mar. 2013
- [5] Qingping Chi, Hairong Yan, Chuan Zhang, Zhibo Pang, and Li Da Xu, Senior Member, IEEE "A Reconfigurable Smart Sensor Interface for Industria WSN in IoT Environment", iee transactions on industrial informatics, vol. 10, no. 2, may 2014 .
- [6] Ricardo Valerdi , Zu De Zhou, Li Wang, May - 2014, "Guest Editorial Special Section On Iot".
- [7] Z. Pang et al., "Ecosystem analysis in the design of open platformbased in-home healthcare terminals towards the internet-of-things," in Proc. IEEE 15th Int. Conf. Adv. Commun. Technol. (ICACT), 2013, pp. 529–534 .