

MULTI FUNCTIONAL DEFENSE ROBOT

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Abstract—Most of the Defense organization now takes the help of robots to carry out many risky jobs that cannot be done by the soldier. These robots used in Defense are usually employed with the integrated system, including video screens, sensors, gripper and cameras. The Defense robots also have different shapes according to the purposes of each robot. Here the new system is proposed with the help of low power Zig-bee wireless sensor network to trace out the intruders (unknown persons) and the robot will be employed with integrated systems, including video camera, sensors, gripper and a weapon. Thus the proposed system, an Multi-functional defense Robot using Zig-bee saves human live and reduces manual error in defense side. This is specially designed robotic system to save human life and protect the country from enemies.

Index Terms—Defense Robot, Zig-bee Component

I. INTRODUCTION

Robotics has been a staple of advanced manufacturing for over half a century. As robots and their peripheral equipment become more sophisticated, reliable and miniaturized, these systems are increasingly being utilized for entertainment, military, and surveillance purposes. A remote controlled surveillance robot is defined as robot that is remotely controlled to capture images/video for specific purposes. Mobile robots that are controlled remotely have important rules in area of rescue and military. A rescue robot is a kind of surveillance robot that has been designed for the purpose of rescuing people. Common situations that employ rescue robots are mining accidents, urban disasters, hostage situations and explosions. Military robots are autonomous robots or remote controlled devices designed for military applications. Such systems are currently being researched by a number of militaries.

Defense robots are also called as unmanned vehicles, which are classified as shown in figure 1 -

Unmanned Aerial Vehicle (UAV) :-

An Unmanned Aerial Vehicle (UAV), commonly known as drone is an aircraft without a human pilot aboard. The flight of UAVs may be controlled with various kind of autonomy : either by a given degree of remote control from an operator, located

on the ground or in another vehicle, or fully autonomously, by onboard computers.

Unmanned Underwater Vehicle(UUV) :-

Unmanned Underwater Vehicle(UUV), sometimes known as underwater drones, are any vehicles that are able to operate underwater without a human occupant. These vehicles may be divided into two categories, remotely operated under water vehicles(ROVs),which are controlled by a remote human operator, and Autonomous underwater vehicles(AUVs),which operate independently of direct human input.

Unmanned Ground Vehicle (UGV) :-

An Unmanned Ground Vehicle (UGV) is a vehicle that operates while in contact with the ground and without an onboard human presence. UGVs can have set of sensors to observe the environment, and will either autonomously make decisions about its behavior or will pass the information to a human operator at different locations who will control the vehicle through teleoperation.

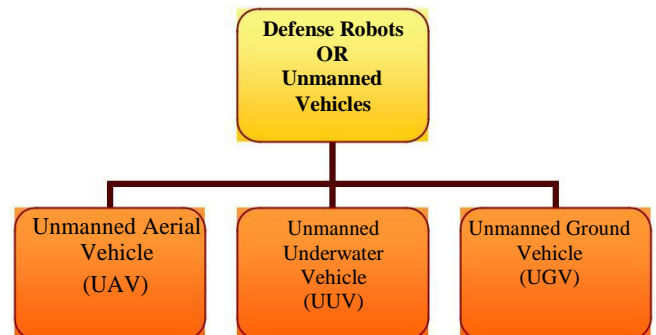


Figure 1-classification of unmanned vehicles

The main aim of the paper is to implement a Wireless multifunctional Defense Robot which can be controlled through computer or laptop using Zig-bee Module having locomotion and navigates around the risk prone areas and tries to identify the intruders,. In addition to this Defense Robot is built with some artificial intelligence for its safety.

It has built in with Proximity metal sensor for detecting metal and MQ6 gas sensor for harmful gas detection. All these functions are done automatically or manually with the help of Visual Basic 6.0 software

II. LITREATURE SURVEY

For the last few decades, robots are becoming very popular and common in Defense organizations. There are many advantages of these robots as compare to human soldier. One of the most important things about these robots is that they have the capability to perform missions remotely in the field, without any actual danger to human lives (5). This shows a great impact of Defense robots. These robots are sturdier and more capable of with-standing damage than human. Therefore they give greater chances of success in dangerous environment. Whenever, a robot is shot down, the Defense simply roll out a new one. But one should not forget about the certain effects and impact of Defense robots. In 2009, academics & technical professionals held a conference and discussed the impact of the speculative possibility that robots and computers could become self-sustaining and able to make their own decisions (1). They also bring forward the possibility and the range to which computers & robots might be able to achieve any scale of autonomy, and to what extent they could utilize such abilities to possibly cause any threat or danger. They briefly discuss about the effects of Defense robots. Experts have also jotted that some robots have acquired several forms of semi autonomy, which includes the ability to find power sources on their own and the ability to select target to attack independently. They also noted that some computer viruses can avoid elimination (4). Besides this, they also considered self-awareness as depicted in science-fiction is probably unlikely, but that there were other potential hazards and pitfalls. Some experts and academics have questioned the use of robots for Defense combat, especially when such robots are given some degree of autonomous functions.

III. SYSTEM ANALYSIS

In proposed system as shown in block dig in figure 2, the communication can be done with the help of the Zig-bee wireless communication network. In this system, the robot is monitored using the CMOS camera. The entire control is resided with the microcontroller. In addition to this, bomb detection, gas leakage detection, live human body detection and laser rifle are included. In this, the robot can move through the rugged surfaces also.

The control of the robot from remote location is done with a computer. The information to the computer is carried out by the advanced technology named Zig-bee Technology. When control signal is given from computer it is transmitted with the help of Zig-bee. Video receiver receives the video signals from camera. The system also contains temperature detection which is being carried out by detecting environmental temperature. In ROBOT section, the sensors like temperature, moisture and metal detector. It is used for

sense changes in surface and atmosphere. Temperature sensor and moisture sensor signal is converted using ADC and sends signal to the microcontroller. There are three motor drivers are used in the robot section. They are the first two motor drivers are used to control the movement of the robot motor. The second motor driver is used to control for the Camera movement in robot. The 12V battery supply is given to the motors for moving the robot and also the supply is given to camera.

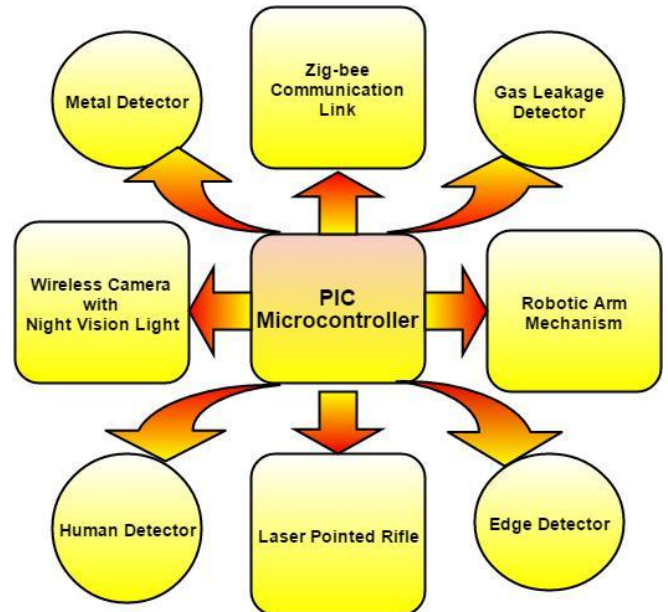


Figure 2-Block dig of proposed system

The PIC Microcontroller is the main part of this project. It is programmed to control the motor driver and camera control motor. The RS232 is used to interface of PC and PIC microcontroller. Using software's can monitor in PC. The software's are visual basic. Power supply for microcontroller is 5V.

IV. CONCLUSION

When we consider Defense robots today, there has been a huge development as compare to those robots used in earlier times. Today, Defense ground robots & unmanned vehicles are used worldwide. However, the significant growth of the current Defense robots comes as the nature of combat changes in every region while the globally integrated enterprise replaces nationalistic dominance. It can be said that Defense robot automation of the defense process is the next wave of Defense evolution. This proposed system gives an exposure to design a simple robot that can be used to do multifunction in defense. Manual control is also employed to control the robot from the control room which is located far away from the border area. The system uses non-commercial Zigbee standard for wireless communication since this provides access to the as-yet unpublished specifications and permission to create

products for market using the specifications. Our system is aimed towards the Zig-bee technology up to 30 meters distance. In future we can increase the distance up to 100m distance. The proposed system is focusing on the welfare infantry to minimize the casualties to a great extent. This also helps on remote bomb detonation and diffusion.

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