A Robust and Multipurpose Robot for Military

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Abstract- **From the ancient times, wars are taking place and it will be happening in future also. In these wars, roles of solders are very important which has changed from past to present. In today's world, foot soldiers will enter in combat situations once aerial bombardment has been done just like Germany fought in Second World War. In addition to this with advancements in technology and engineering, battles will be fought differently. A new system has been developed namely automatic mode and user control mode. A face recognition technique to combat intruders is present in the automatic mode while user control method used in critical situations where robots are controlled remotely using computers. An advantage of this system is that movement of robots can be controlled in real time during military operations. It can be used in situations where human live would be in danger like to detect and defuse bombs. The objective of this system is to provide a robotic system that can combat in wars and other military purposes [8].**

Index Terms—**Automatic mode, Robot, Remote user control, Bomb Detection & Diffusion.**

I. INTRODUCTION

Advancement in technology has always helped human beings. Technology advancement can either be a new research or it could be a modification in an existing technology. It is applicable in each and every area where ahuman being works. But defence sector is in dire need of technology advancement as lives of many human beings are always at stake due to wars etc.

So in order to make life in defence sector easier, robotic system was developed. This robotic system uses variouskinds of sensors which makes it useful for various applications like fight with enemies, identification of enemies using Facial Recognition technique etc. Also robots are also used for detection and diffusion of bombs, fire etc.

II.EXISTING SYSTEM

Already a lot of advancement has been done in the defence sector. The term Robotics has already become familiar in the defence sector. Robots are being used for various applications. Automatic motion vehicles are being used for surveillance purpose, pick and place robots are used in manufacturing industries. Inaddition to these applications, robots are being developed for combatting operations in wars. This robot is named "Security Warrior" and consists of five systems including vision, motion; robot arms, power estimation and remote supervision. The vision system is used to carry out human detection and tracking [1]. The motion system is built by using embeddedsystems and used to achieve motion planning in real time. Oneof the main things to be noted is that all that have beendiscussed above is only under R & D (US DEFENCE) and areintended to be implemented by 2015[9].

III.PROPOSED SYSTEM

In this existing system therobots are available for only remote monitoring while in this proposed system additional feature of controlling robot from remote locations is possible using user control method. This technique helps to take real time decisions during military operations. Also this system includesan automatic mode in which face recognition technique used to combat intruders. These techniques help to detect and diffuse bombs.Thus this system is more reliable to combat the enemy than the present combat practice. This system also includes fire detection module and intruder detection module which is being carriedout by using facial recognition techniques [5].

IV.HARDWARE REQUIREMENTS

Microcontroller

- Microcontroller is a microprocessor which consists of a memory unit.
- These microcontrollers help to provide highly flexible and economical solution for various embedded control applications and are readily available in the market.

Earth Mine Detection

- As the robot are designed in such way that they are capable of moving around different places by detecting different obstacles the presence of a earth mine can be easilydetected by using earth mine detection sensors andother methods [2].
- An in-built sensor in the robot detects bombs or earth-mines or any other hidden thing which is hazardous. Robot will detect this and will send signal to controller and can avoid life threatening things.

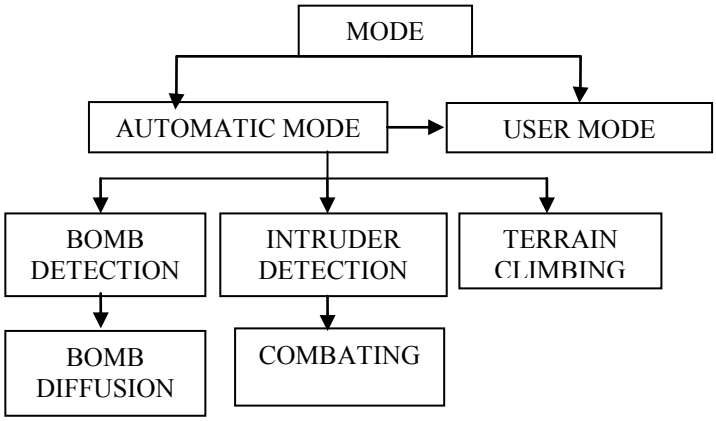
PIR Sensor

- The Robot consists of in-built PIR sensor, which will helpto detect the alive human beings [2]. This sensor detects infrared waves of wavelengths 8 to 12 micrometres radiated from human body and will give signal to controller.

LDR

- LDR's are used to sense the Fire; here we use powerful and sensitive "LDR" (Light Dependent Resistor) for the flame detection Normally LDR senses all the lights. But in this casewe have to sense only Blue and Yellow flame andreject sunlight and other luminaries [2].
- We have provided an essential circuit which will reject ambient andluminaries lightings and will sense only the desired colours of the flame.

V .BLOCK DIAGRAM



Automatic Mode

- In automatic mode, user has no control over robot and its actions until critical situation.
- Robot uses its own intelligence to take situational decisions and performs required action.
- Under inexorable circumstances the control spontaneously goes to the user.

User Mode

- In this mode the user has the complete control of the system.
- The user can control the robot using computers from the remotelocation and perform the required operations.

Bomb Detection

- Laser Gun can be used to Detect Roadside Bombs. An image of the laser gun is shown below

- Trained wasps are used to detect the bombs [4].
- "WaspHound" device is enclosed in gun which gives trigger or alarm or visualsignal.
- NQR (Nuclear quadruple resonance) is another technique for detecting the explosives.

Bomb Diffusion

- Bomb diffusion can be made in both the user and in the automatic modes.
- Robot detects and diffuses the bomb by deactivating circuitry of bomb using automatic mode [9].
- If RDX material found in bomb, robot heats the bomb above 200˚C to decompose and diffuse bomb.
- If there is failure in bomb diffusion by robot, control automatically goes to user and using user control method using computers, user diffuses the bomb from remote location.

Intruder Detection

- Here in this module the intruders are being detectedby using facial recognition techniques.
- Here a database of this infantry is stored and this iscompared for detecting the intruders.
- A high quality facial recognition technique is used whichcan detect even a face covered with amask.

Combating

- Robot starts combating operation once it detects intruder using camera.

Terrain Climbing

- This proposed robot produces its electro linkage forces byapplying a small amount of power to pads that induceelectrostatic charges onto the wall's surface.
- The advantage of terrain climbing over conventional adhesives is electro adhesion is able to repeatedly clamp onto dusty surfaces of different materials like wood, concrete, steel or glass surfaces etc.

Fire Detection

- As stated earlier LDR's are employed to sense the Fire. A powerful and sensitive "LDR" (Light Dependent Resistor) isused for flame detection.

- The LDR senses only blue and yellow flames and rejects all other ambient light
- A circuit is employed to reject ambient light and sense only blue and yellow flamesand luminaries lightings and desired colour.

V. ADVANTAGES

- This robot has remote controlling facility so user can perform various operations from remote locations.
- This robot also has powerful assembled bomb diffusiontechnique.
- This robot can also climb terrains and combat with Intruders

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VI. DRAWBACKS

- One of the major disadvantage of this robot is the response time is high.

VIII. CONCLUSION

The proposed system aims to minimize casualties' o a great extent. The remote bomb detonation and automatic bomb detection technique gives an additional edge to this system. The terrain climbing facility warrants that this system can beused in hilly regions. Hence, this 7thSENSE is sure to create waves in the field of robotics.

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