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Autonomous robots for military

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Abstract
Military robots are the autonomous robots or can be remote controlled robots which are designed especially for the military applications. The military robots can do the dangerous tasks instead of the soldiers if there was something gone wrong; we would lose only the cost of the robots instead of losing the soldiers life. Imagine a war with Hi-Tech robots', instead of our soldier's shroud returning home in caskets with heartbroken hearts of families and troop, autonomous robots that can make decisions, such as firing on a specific object without human instructions. These autonomous robots can replace the human army with Hi-tech robotics in an increasing range of dangerous tasks and missions such as searching terrorists in the dark caves, securing urban streets, patrolling the borders and waterways, guarding skies and buildings etc. These autonomous robots would be functioned/controlled by the soldiers those are seating in the headquarter; by the increase in the technology, we can also make these robots fully autonomic by using AI (Artificial Intelligence). AI in the robots can make them smart as the human and can perform decision faster than the humans but this technology is not developed totally so we will replace the soldier by these robots and the soldiers will control these robots from the headquarter and save the life of soldiers.

Keywords: autonomous, military robots, solar panels

1. Introduction
The vision of robots in force is not a today's concept but it was introduced to military was dated back from 1898 by the introduction of radio boats by Nicola Tesla. It was visualized by many visionaries in the last century. They were used by Germans and Russians in Second World War. Russians used and Goliath were used by Germans. The Teletanks were equipped with DT machine guns, flamethrowers and smoke container to provide a smokescreen. The use of Goliath which is a mobile landmine in World War II by the Third Reich's forces also marked as a turning point in the history of military robots. And today the development in this technology is well demonstrated by military robots in Afghanistan and Iraq. At present the most commonly used military robot is the unmanned aerial vehicle IAI Pioneer and RQ-1 Predator [1].
One threatening question must be arising, as in every science fiction movie, it is shown that robots have gone crazy and started hunting us, will they go crazy in real world also? Actually, at present it is almost impossible. The developers have very well taken care of this aspect. Most of the military robots are remotely controlled by a human. And if someone has gone crazy then there is a reset button which clear there memory and they again come back to normal state. But with the development in artificial intelligence and military robots, there should be greater attention to implicate their ability to make autonomous decision [1, 2].

2. Why military robots
To perform difficult task such as walking through minefields, deactivating unexploded bombs. Military robots can do these tasks without any fear instead of human army and can save solider from dangerous, dirty or mission. The robots can replace the soldiers in the dangerous missions such as crawling through the caves or in the streets during the wars, They can reduce the casualties. The military robots do not get tired, they do not need to sleep, they do not know fear, they are tele-operated and not equipped with weapons, and they are used for the surveillance, the sniper detection, And they can neutralize the explosive devices. They can do the risky jobs with the integrated system of sensors and they have different shapes according to the purposes of each robot. And can modified as per their need. some of them can fit into the spaces which are fit easily accessible for the humans as tight and the dark spaces that are common and the robots are a perfect fit for doing that task [2].
It bears cost to build the robot instead of losing a solider or a human being. And in any case if there were something gone wrong, we would only lose the money of the robots instead of losing the soldier life [3, 4].

Fig 1: US army specialist Nathaniel Anselmo with robot called Talon [5]

3. Module for military

This type of robots can be used in the fields like on boarder for supervising. These types of robots in military will not only reduce the work of soldiers but also the life of a soldier. It is an remote controlled robot which can be controlled by soldier in the field by a remote or from directly from the headquarter of the military.

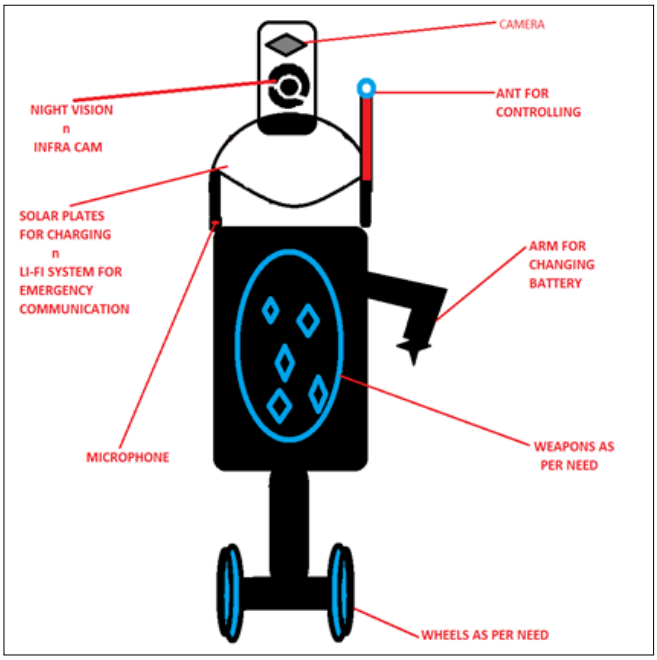

Fig 2

4. Main keys of that robot in military

Cameras: This autonomous robot has the capability to see clearly in the Night even in dim intensity. The robot has five cameras. Two of five cameras mounted on his top. Both of them can be rotated 360 degree. One of two camera is a infrared camera which can be seen even in the dark and also from that camera we have the thermal camera in it. So, from thermal camera we can detect a person from the distance and also can see the human images of thermal even if the guy is beyond the object.

Thermal Imaging

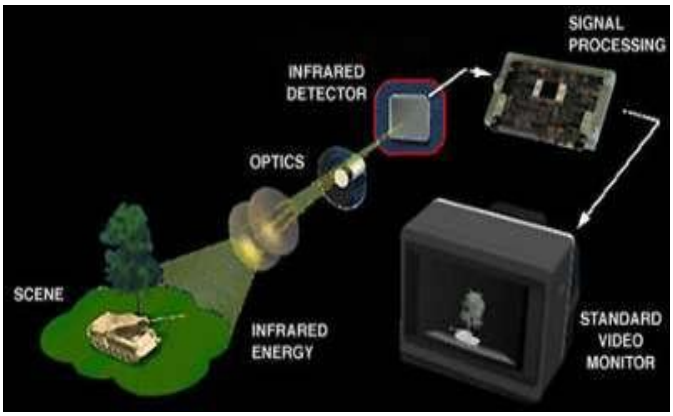

Fig 3: The basic components of a thermal-imaging system here's how thermal imaging works:

A special lens focuses the infrared light emitted by all of the objects in view. The focused light is scanned by a phased array of infrared-detector elements. The detector elements create a very detailed temperature pattern called a thermogram. It only takes about one-thirtieth of a second for the detector array to obtain the temperature information to make the thermogram. This information is obtained from several thousand points in the field of view of the detector array. The thermogram created by the detector elements is translated into electric impulses. The impulses are sent to a signal-processing unit, a circuit board with a dedicated chip that translates the information from the elements into data for the display. The signal-processing unit sends the information to the display, where it appears as various colors depending on the intensity of the infrared emission. The combination of all the impulses from all of the elements creates the image [6].

Fig 4: It is quite easy to see everything during the day...

Fig 5: But at night, you can see very little.

Fig 6: Thermal imaging lets you see again.

Most thermal-imaging devices scan at a rate of 30 times per second. They can sense temperatures ranging from -4 degrees Fahrenheit (-20 degrees Celsius) to 3,600 F (2,000 C), and can normally detect changes in temperature of about 0.4 F (0.2 C). So from this system or machine we can detect a human body or a soldier in the field of war or at border line even after the solider is beyond or within in the machine or an obstacle he can exposed using the thermal camera which can't not be seen by a naked eye [6].

The third camera is a rare camera which will only show the backward images. The forth one is for the weapon triggering & can be zoomed in for seeing and for perfect triggering to shot. The fifth camera is integrated with the arm (The function of arm is described below) and used special for arm functioning.

Solar Panels: Solar energy works by capturing the sun's energy and turning it into electricity to use it further. Our sun is a natural nuclear reactor. It releases tiny packets of energy called photons, which travel the 93 million miles from the sun to Earth in about 8.5 minutes. When photons hit a solar cell, they knock electrons loose from their atoms. If conductors are attached to the positive and negative sides of a battery, it forms an electrical circuit. When electrons flow through such a circuit, they generate electricity. Multiple cells make up a solar panel, and multiple panels (modules) [7]. The more panels you can deploy, the more energy you can expect to generate. There will be two battery in the robots one an removable battery and has the great power in it to stand the robot for maximum hours. The another battery is a permanent battery which is directly connected to the solar panels and stand the robot for at least half of the hour. The reason for the two battery we'll discuss later in the paper.

It is essential to the robot that the robots at border has the weapon and can trigger the terrorist if the terrorist enter in the country. Here we can use many weapons as need such as INSAS assault rifle, AK series of rifles, Dragunov sniper rifle. Mauser sniper rifle, INSAS Light Machine Gun, Browning 9mm pistol, Sterling 9mn carbine, Beretta 9mm pistol. The weapon we use will depend on the damage we want to make. It also contains some bombs for area damages [10].

G. Wheels: The wheels of robots are different because as the robot is made for patrolling at the border line. The border can be at normal, snow or desert area. So as the need of the robot the wheels should be change for better performance.

Why we use two batteries the robot: There will be two batteries in the robots. One is a permanent battery and another one is a removable battery. The permanent battery is used for standby when the second battery is discharge. Here the arm is used. The arm will remove the removable battery and replace it with the charged battery. The removable battery is again go for charging and the process will go so on. The two battery will help the robot for making it fully autonomous and all these task can be perform from the distance without the help of a human being. And make robots independent to use for patrolling.

Survey of patrolling: Every year many soldiers are killed on duty while patrolling at border. According to the South Asia Terrorism Portal (SATP). Civilian casualties along the line of control (LoC)—the de facto border between India and Pakistan in J&K—in 2016 were the lowest in three decades, SATP data reveal. About 800 civilians died every year, on average, between 1990 and 2007 [11].

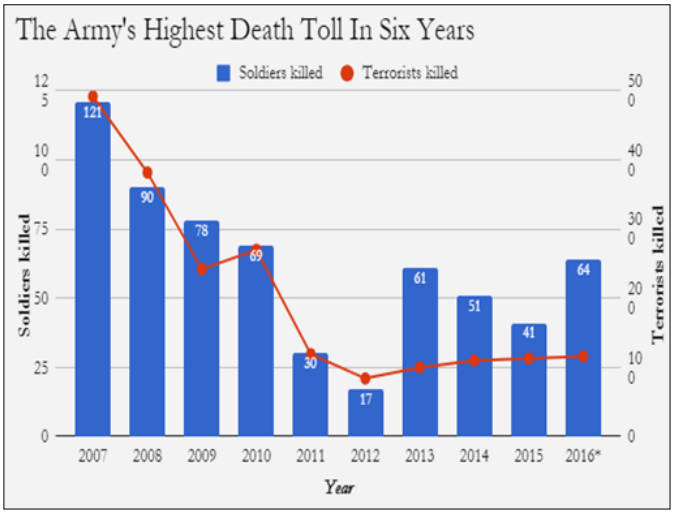

Fig 7: Graph of army's death toll in six years

5. Conclusion

By replacing the soldier with this autonomous robots we can save life. We all know a robot can do task much accurately than a human beings so with these we will have the accuracy. It also reduces the level of mistakes and risk. They can perform much better tasks than human beings because they don't have the fear and can modified as per needed & can be fitted at small spaces.

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