

## **DEVELOPMENT OF ROBOT FOR HANDLING HAZARDOUS CONDITION IN WAR FIELD**

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### **ABSTRACT**

Our project is developed for mainly military use to perform activities in dangerous situations. This robot act as a companion to our soldiers, with its sensor-based robotic system which helps them to perform better in unexpected or hazardous conditions. It has military as well as civilian applications too like surveillance, firing, bomb detector, hostage situation, border patrolling etc. By varying size of this robot, we can cope the situation accordingly like life support, communication center etc...This robot is capable of performing multiple functions in war field since it comprises a gun, bomb detector and camera in it. It can silently enter into the enemy area and spy on them. It can collect information about the enemy with the help of camera on it. It will play a vital role in the future military generation.

**Keywords:** *Military robot, Camera extraction, bomb detection, enemy detection, firing.*

### **I. INTRODUCTION**

From the early stage, many army men die for their countries. If one cannot create life it means one does not possess the right to destroy it. As a result, many countries has started using robots in the war field, there is a possibility to lose our soldier in the war situation. So our thought is to deploy this robot before soldiers that mean robot will be our first line of defense. We are concentrating on securing the base of army from invaders and sometimes it can also act as an intruder. Soldiers say one of the largest benefits to having this "Is the ability for this vehicle to stop out opponent snipers in the region. The robot and their remote control station play very important role in the upcoming military operations. The thought of introducing robot in the army is suggested by DRDO to save the life of men and women. In the current system, our soldiers have to stand in the border for the long time in circling timings not only this problem, they have to bare the climatic conditions which are the great problem to face. Whenever the enemy enters the border our soldier has to fight against them. The possibility of defeating them depends on one may live or they may. Anyway, a human loss will happen. Military Companion Robot can be used for different kind of applications like hostage situation, law enforcement, border surveillance, riot control, security services, intruder, life safer and communication center and can provide various type of capabilities, to army men during a hazardous conditions.

### **II. RELATED WORK**

Through research of a bunch of IEEE papers and a few other articles makes it understood that autonomous drones system has a great capacity in robotics research and it is used in industrial applications. An unmanned ground vehicle (UGV) is a vehicle that operates while in contact with the ground and without an available human presence. UGVs can be used for many applications where it may be difficulties, dangerous, or impossible to have a human operator present. Generally, the vehicle will have a set of sensors to observe the environment, and will either autonomously make decisions about its behaviour or pass the information to a human operator at a different location who will control the vehicle through remote. Unmanned robotics are being actively developed for both civilian and military use to perform a variety of dull, dirty, and dangerous activities. A working remote controlled car was reported in the October 1921 issue of RCA's *World Wide Wireless* magazine. In the 1930s, the USSR developed Tele tanks, a machine gun-armed tank remotely controlled

by radio from another tank. During World War II, the British elaborated a radio control version of their Matilda II infantry tank in 1941. Known as "Black Prince". The first major mobile robot development effort named Shakey was created during the 1960s as a research study for the Defence Advanced Research Projects Agency (DARPA). Shakey was a wheeled platform that had a TV camera, sensors, and a computer to help guide its navigational tasks of picking up wooden blocks and placing them in certain areas based on commands. DARPA demonstrated the Autonomous Land Vehicle, the first UGV that could navigate completely autonomously on and off roads at useful speeds. A remote-operated UGV is a vehicle that is controlled by a human operator via interface. All actions are determined by the operator based upon either direct visual observation or remote use of sensors such as digital video cameras. A basic example of the principles of remote operation would be a remote controlled toy car. Transmission between UGV and control station can be done via radio control, fibre optics etc. There are a wide variety of UGVs in use today. Predominantly these vehicles are used to replace humans in hazardous situations, such as handling explosives and in bomb disabling vehicles, where additional strength or smaller size is needed, or where humans cannot easily go. Military applications include surveillance, reconnaissance, and target acquisition. They are also used in industries such as agriculture, mining and construction. UGVs are highly effective in naval operations, they have great importance in the help of Marine Corps battle; they can additionally avail in planning operations on to the land and afloat UGVs are also being developed for peace keeping operations, ground surveillance.

### III. PROPOSED WORK

The model comprises of a PC which is interfaced to the transmitter. Receiver is the pc by which commands or specific key is pressed using the keyboard to send wirelessly through serial port where LoRa WAN transmitter is connected. The four arrow keys on the keyboard are the control keys. The UP arrow key is used to move forward, the DOWN arrow key is used to move backward, the LEFT and RIGHT arrow keys are used to control the motion of the robot in the left and right directions respectively. Transmitter consists of microcontroller. It observes for any noise within its position, if any sound like, firing towards the tanker gets noticed, a servo motor turned towards it which has got a rifle on it will start firing back towards the enemy region. Another servo motor has been fitted with wireless camera on it to observe the surroundings when the tanker is moving. When clap switch which senses any sounds around it will make its bit high and passes it to the microcontroller, the particular duration PWM signal will be sent to the servo motor which makes its shaft to rotate the firing point of the rifle towards the enemy and starts firing. Another servo motor will be controlled by the user so that he can adjust the direction of the camera and sense any foreign object. The movement of the robot is mainly based on the commands send through LoRa WAN module connected to PC. We are also using color sensor for hiding purpose.

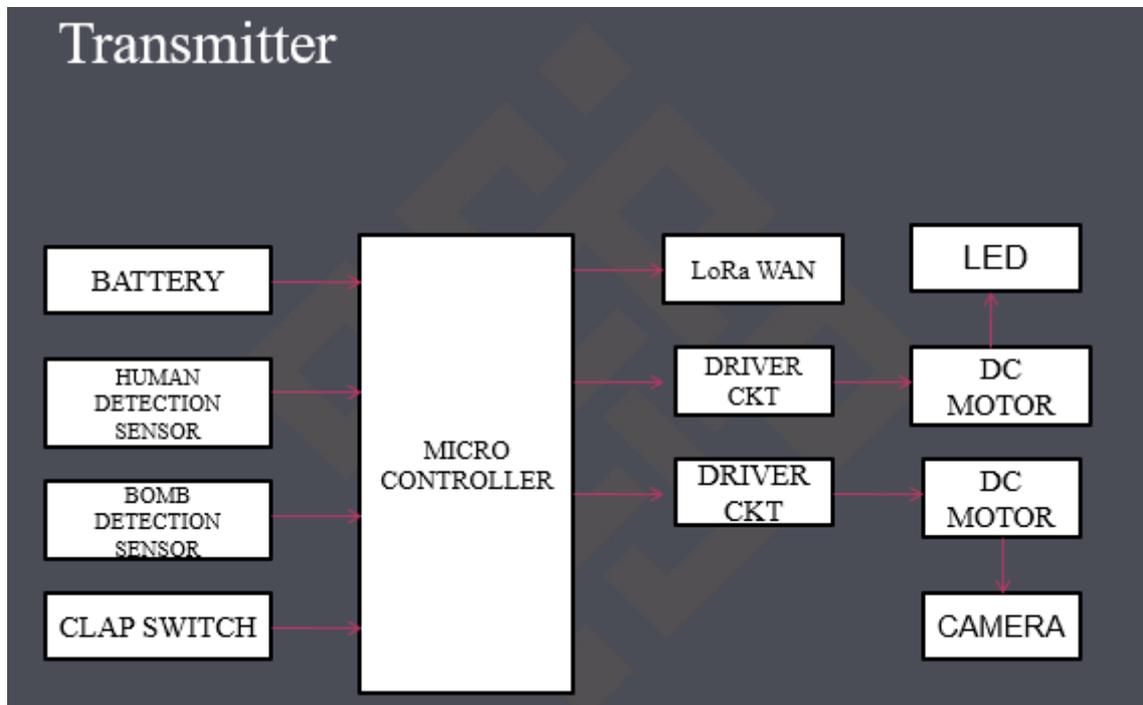


Fig 1: Transmitter block diagram

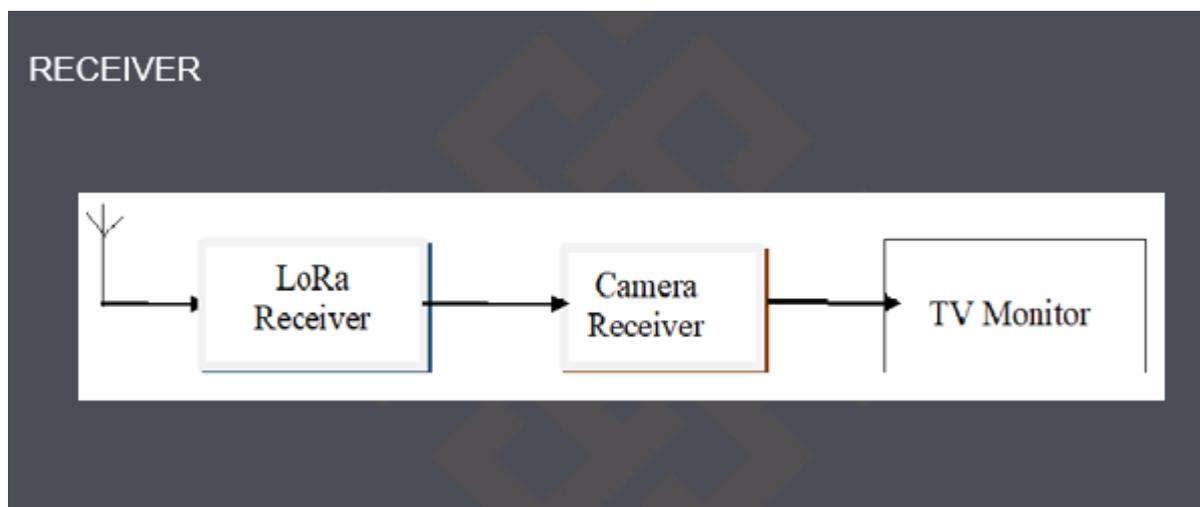


Fig 2: Receiver Block diagram

#### IV. HARDWARE AND SOFTWARE REQUIREMENTS

Table: 1

HARDWARE REQUIREMENT	SOFTWARE REQUIREMENT
<ul style="list-style-type: none"><li>❖ Human Detection sensor</li><li>❖ Color sensor</li><li>❖ Bomb Detection sensor</li><li>❖ Sound sensors</li><li>❖ DC motors</li><li>❖ Driver circuit</li><li>❖ Wireless camera</li><li>❖ LoRa WAN Module</li></ul>	<ul style="list-style-type: none"><li>❖ Arduino IDE</li><li>❖ Embedded C</li></ul>

#### V. CONCLUSION

Robots are developed not only for single purpose but for many uses. This project is used to help our soldiers in hazardous condition in border regions. This robot is used for military purpose and can watch enemies in the border area and it can give the notification when a person is spotted through the camera. It is used for surveillance for security purpose, reconnaissance and in emergency hazardous condition. It can replace soldiers in the dangerous missions such as crawling through caves during wars. It can detect the explosion noise using sound sensor and it fires back to the enemy region by locate the direction from where the explosion happened. It can detect the presence of bomb and give the notification to the soldier. Robot communicates through LoRa WAN which is long range wide area network and it ranges from 10km to 15km. Hence this robot is helpful in the hazardous situations in Warfield.

#### REFERENCES

- [1] Compact unit unmanned weapon system for today's army, Carrier, J.D. Smith, E.D. Wade, A.M. Walker, P.S. Kwinn, and M.J. United States Mil. Acad., West Point.
- [2] Existing mapping using high resolution digital camera and unmanned aerial vehicle for Geographical Information System, Ahmad, A. Samad, A.M. Dept. of Geoinformatics, Univ. Teknol. Malaysia, Skudai, Malaysia.
- [3] A system-of-systems structure for the improved capability of revolutionary tracking missions involving unmanned aerial vehicles Kim, A. Kim, M. Puchaty, E. Sevcovic, M. Delaurentis, D. Sch. of Aeronaut. & Astronaut., Purdue Univ., West Lafayette, IN, USA
- [4] Solar Power System for investigational unmanned aerial vehicle (UAV); design and making Torabi, H.B. Sadi, M. Varjani, A.Y. AmirKabir Univ. of Technol., Tehran, Iran
- [5] Desegregated identification modelling of rotorcraft-based unmanned aerial vehicle Budiyono, A. KwangJoon Yoon Daniel, F.D. Dept. of Aersp.-IT Fusion Eng., Konkuk Univ., Seoul, South Korea