

War filed spy robot with target detection & shooting using camera

Pooja Gondaliya¹ Manish Jadav² Monika Ponkiya³ Tejashri Manavadariya⁴

Prof. Bhavana Savaliya⁵

^{1,2,3,4}Student ⁵Professor

^{1,2,3,4}Department of Electronics and Communication Engineering

^{1,2,3,4}Dr. Subhash Technical Campus, At: Junagadh – 362001, Gujarat, India

Abstract— In this paper a robot will be helpful for spying and object detect & shooting purpose in war fields. A robotics vehicle using Bluetooth or RF technology for remote operation attached with wireless camera for monitoring purpose. This project proposes an autonomous moving system which automatically finds its target from a scene, lock it and approach towards its target and hits through a shooting mechanism. The main objective is to provide reliable, cost effective and accurate technique to destroy an unusual threat in the environment using image processing. Humans have evolved to better survive and have evolved their invention. In today’s age, a large number of robots are placed in many areas replacing manpower in severe or dangerous workplaces. Moreover, the most important thing is to take care of this technology for developing robots progresses.

Key words: Capacitor Bank, Coil Gun, Image Processing, Microcontroller, Trigger Mechanism, embedded c

quality webcam and has a self-made linear projectile mechanism. The webcam captures the real time frame or image of the surrounding more specifically called an arena [4]. Then the frame of an image goes as an input in the computer software called MATLAB and the image is being processed using Image processing techniques. Then signal has been produce for the robot whether to move or take left, right and forward. There is also a trigger mechanism installed in a robot which activates the linear projectile shooting mechanism. This trigger mechanism gets activated when the robot fully detects its target and achieved its acceptable distance and linear projectile mechanism is activated based on the Fleming thumb rule and the bullet is fired in the direction of the target. The figure 1 shows the Work Flow of the proposed method.

I. INTRODUCTION

Robotics is one of the major growing technique that can change the way people live. Some of those robots target those who are elders and disable and solve their problem. In a war filed we are used this robot for spying purposes. the remote operation connected with the wireless camera mounted on the robot for monitoring purpoThe main objective of this project is to make an autonomous robot which is capable of going to a remote area, recognizing a target there, follow it, and shoot target once it is within an acceptable distance. The successful execution of the prototype will reinforce the positive contribution of the technologies used.[1] The overall system is controlled by mobile application through Bluetooth. This wireless Bluetooth system has been very popular as they provide comfort, security and safety. Moreover they support remote monitoring facilities.

II. SYSTEM OVERVIEW

In a war filed spying robot with target detection & shooting there are two sections::(1) target detection (2)target shooting

A number of robots have been built which can follow a defined path or take pictures in surroundings or can detect an object but there is no one which can find a target, follow it and shoot it down from a certain distance. Most of the robots make use of sensors like infrared sensor, proximity sensor or white line sensor to trace their path. Some make use of motion planning with complete information in which they collect information about the premises or the environment before starting the motion and act accordingly [2]. Some may also use a Kinect camera as a vision system [3].

We have developed a system in which a robot autonomously goes to any remote area and detects its target and shoot from an acceptable distance. The robot is pre-programmed and comprises of a micro-controller with good

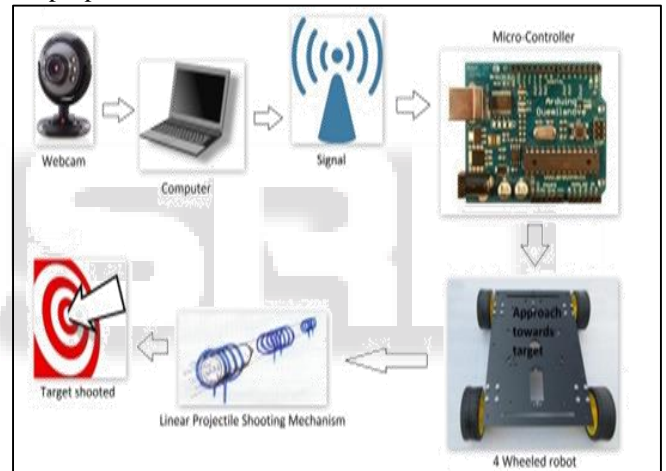


Fig. 1: Work flow of proposed method[8]

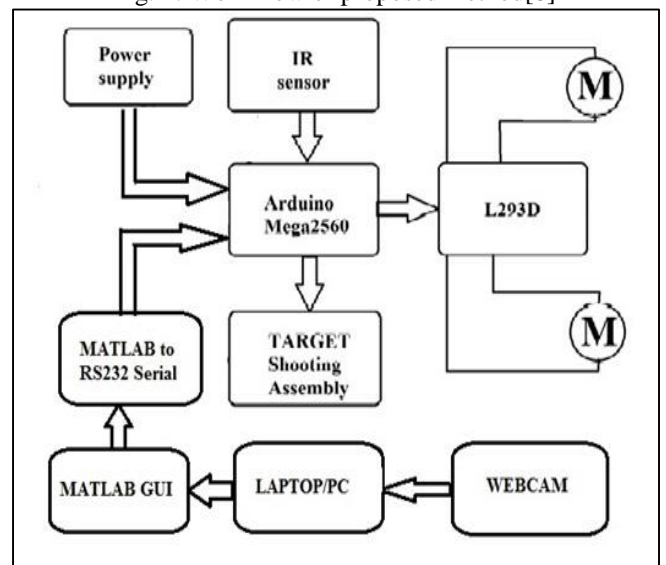


Fig. 2: Functional Block diagram of system

III. HARDWARE DESIGN METHODOLOGY

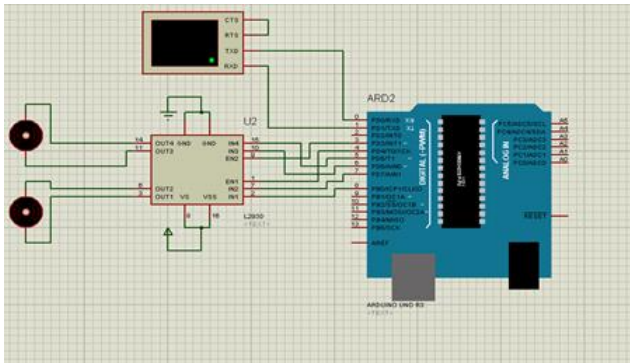


Fig. 3: Block Diagram of Methodology

The robot is self-assembled consist of metallic chassis having 4 geared DC (Direct Current) motors of 200 RPM, 4 plastic wheels are attached to the motor, one WABCAM camera is mounted in the front of the robot. The Camera is connected to the computer. A microcontroller ATmega2560 is connected to the computer.it operates at 5 V DC supply having 32 KB flash memory and 16 MHZ clock frequency. Computer is connected to the micro-controller by the USB cable connector. The computer sends the signal command to micro-controller in which direction it has to be moved. The shooting mechanism comprises of Coil gun, Capacitor bank and Trigger mechanism.

Bluetooth HC-05 module is directly connected with Arduino mega, which consist of 80 pins. Out of these pins numbers 22 – 52 are digital I / O pins. Pins 24 – 27 are for DC motor. IC L293D is used to interface DC motor with Arduino. Pin number 31 – 32 are for ultrasonic sensor .The Arduino mega contains four serial channels. Each channel has two pins one is for transmission and other is for reception. So in all there will be 8 pins. The channel used here is channel one named as Tx1 and receiver channel as Rx1. The total power supply used here is 12 V. DC motor works at 12 V.

IV. HARDWARE IMPLEMENTATION

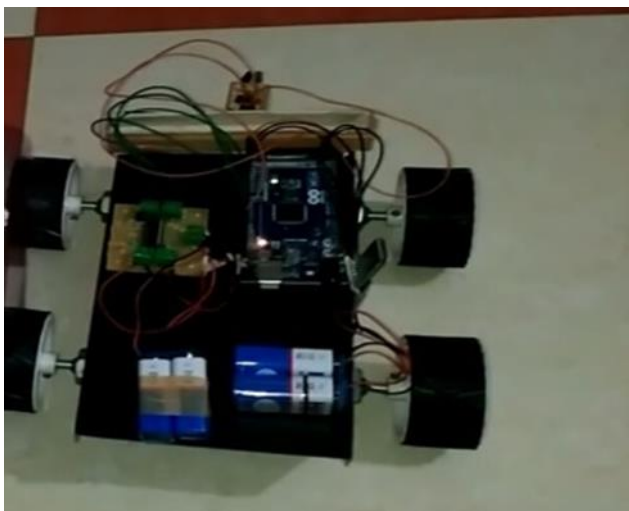


Fig. 4: Implemented Circuit

Coil gun:

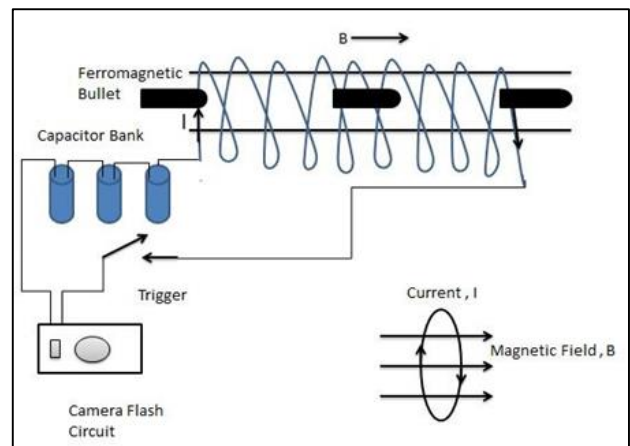


Fig. 5: Working principle of shooting mechanism [8]



Fig. 6: Coil tube [8]

The gun is charged projectile accelerator which makes use of magnetic effect of electric current to accelerate a ferromagnetic substance used a bullet. The coil gun has been made by winding copper wires around a non-ferromagnetic barrel. After the image detection is complete, the trigger mechanism is activated using servos and the coil gun turns on. If the gun is loaded, the bullets fired in the direction of the object and the target is shot down.

V. CONCLUSION

An autonomous moving robot has been implemented which is capable to detect a certain object, approaches towards its target and shoot it down. The result shows that the accuracy to find.

REFERENCE

- [1] Harish Kumar Kaura, VipulHonrao, SayaliPatil, Pravish Shetty,," Gesture Controlled Robot using Image Processing", (IJARAI) International Journal of Advanced Research in Artificial Intelligence, Vol. 2, No. 5, 2013
- [2] Qing Li, Wei Zhang, Yixin Yin, Zhiliang Wang, and Guangjun Liu. An improved genetic algorithm of optimum path planning for mobile robots. In Intelligent Systems Design and Applications, 2006. ISDA'06. Sixth International Conference on, volume 2, pages 637{642. IEEE, 2006.
- [3] Gesture Controlled Robot using Kinect <http://www.e-yantra.org/home/projects-wiki/item/180gesture-controlled-robot-using-firebirdv-and-kinect>.
- [4] ShahedShojaeipour, Sallehuddin Mohamed Haris, ElhamGholami and Ali Shojaeipour,," Webcam-based Mobile Robot Path Planning using Voronoi Diagrams

and Image Processing”, Proceedings of the 9th WSEAS International Conference on Applications of Electrical Engineering.

- [5] <https://en.wikipedia.org/wiki/Coilgun>
- [6] https://en.wikipedia.org/wiki/Image_processing
- [7] Hameedah Sahib Hasan and Dr. P.Ramesh Babu, “Analysis and Control of Mobile Robot for Pipe Line Inspection”, International Journal of Mechanical Engineering & Technology(IJMET), Volume 4, Issue 5, 2013, pp. 1 - 9, ISSN Print: 0976 – 6340, ISSN Online: 0976 – 6359.
- [8] Robotor an autonomous vehicle for target detection and shooting.
<https://www.iaeme.com/MasterAdmin/uploadfolder/30120140506012-2/30120140506012-2.pdf>

