

# Very Long Range Spy Robot With Obstacle Detection

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**Abstract**—In present time almost everything used basically is operated by remotes. The biggest limitation of remote controlling is its limited frequency level. To overcome this limitation one can use satellite and connect the device to satellite then operate it from any part of the world. This can be easily done by using one of the most spread network of the world the mobile network. This paper suggests a method for robotic control using the DTMF tone generated when the user pushes mobile phone keypad buttons when connected with a remote mobile robot.

**Index Terms**—Dual tone Multiple frequency( DTMF),Ultrasonic sensor,Arduino UNO, L293D Motor driver,Motors,DTMF tones.

## 1 INTRODUCTION

THE proposed paper on Long Range Spy robot allows operating a robot irrespective of the distance of the person operating it. This system Long Range Spy Robot with Obstacle Detection allows not only to control the robot's movements but also to stop the robot as soon as the robot encounters an obstacle. The user of this system doesn't have to worry about the distance in order to operate the robot In order to make the robot move.

This system Long Range Spy Robot with Obstacle Detection allows not only to control the robot's movements but also to stop the robot as soon as the robot encounters an obstacle. The user of this system doesn't have to worry about the distance in order to operate the robot. The system does this with the help of DTMF technology which allows sending data commands via a call. The user wishing to operate the robot will just have to call on the mobile phone connected to this system. This system consists of arduino which is interfaced to the ultrasonic obstacle detector, spy camera and the system also uses battery. The ultrasonic obstacle detector helps to detect any obstacle that comes in the way of the robot. The robot automatically stops once it detects any obstacle and then waits for the user commands. In order to operate the system, the user has to make a call to the phone connected to this robot. The receiver phone will have to receive the call in order to data commands necessary for the robot movements. The data commands will make the robot to either go in forward, backward, left or right direction. The system makes use of night vision enabled spy camera with the help of which the user can view the area captured by this spy camera which will be mounted on this robot. The user can view the area captured by this wireless camera not only during day time but also during night.

All the area captured by this spy camera can be viewed in the PC. Thus with the help of DTMF technology, the system now allows the users to control the robots movement via mobile phone and stop its movement if an obstacle is encountered.

## 2 TECHNOLOGY USED

### 2.1 ARDUINO

Arduino is an open-source electronics platform based on easy-

to-use hardware and software. Arduino boards are able to read inputs - light on a sensor, a finger on a button, or a Twitter message - and turn it into an output - activating a motor, turning on an LED, publishing something online. You can tell your board what to do by sending a set of instructions to the microcontroller on the board. To do so you use the Arduino programming language (based on Wiring), and the Arduino Software (IDE), based on Processing.

Over the years Arduino has been the brain of thousands of projects, from everyday objects to complex scientific instruments. A worldwide community of makers - students, hobbyists, artists, programmers, and professionals - has gathered around this open-source platform, their contributions have added up to an incredible amount of accessible knowledge that can be of great help to novices and experts alike.

Arduino was born at the Ivrea Interaction Design Institute as an easy tool for fast prototyping, aimed at students without a background in electronics and programming. As soon as it reached a wider community, the Arduino board started changing to adapt to new needs and challenges, differentiating its offer from simple 8-bit boards to products for IoT applications, wearable, 3D printing, and embedded environments. All Arduino boards are completely open-source, empowering users to build them independently and eventually adapt them to their particular needs. The software, too, is open-source, and it is growing through the contributions of users worldwide.[1]

### 2.2 Dual Tone Multiple Frequency (DTMF)

DTMF (dual tone multi frequency) is the signal to the phone company that you generate when you press an ordinary telephone's touch keys. In the United States and perhaps elsewhere, it's known as "Touchtone" phone (formerly a registered trademark of AT&T). DTMF has generally replaced loop disconnect ("pulse") dialling. With DTMF, each key you press on your phone generates two tones of specific frequencies. So that a voice can't imitate the tones, one tone is generated from a high-frequency group of tones and the other from a low frequency group.

A number of companies make microchips that send and re-

ceive DTMF signals. The Telephony Application Program Interface (TAPI) provides a way for a program to detect DTMF digits.[2]

### 3 WORKING

DTMF controlled robot run by some commands that are send via mobile phone. We are here using DTMF function of mobile phone. Here we have used the mobile phone to show working of project. One is user mobile phone that we will call 'remote phone' and second one that are connected with Robot's circuit using aux wire. This mobile phone we will call 'Receiver Phone'.

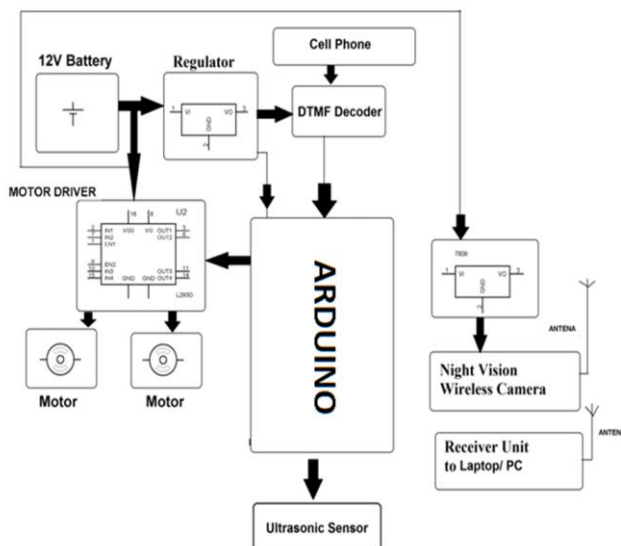
First we make a call by using remote phone to receiver phone and then attend the call by manually or automatic answer mode. Now here is how this DTMF controlled robot is controlled by cell phone:

When we presses '2' by remote phone, robot start to moving forward and moving continues forward until next command comes, when we presses '8' by remote phone, robot change his state and start moving in backward direction until other command comes, when we press '6' robot turned to right, when we press '4' robot turned to left and for stopping robot we pass '5'.

There are five conditions in this **DTMF controlled Robot** that are giving below:

Mobile Key	Input				Output				Robot Movement
	DTMF Decoder				Motor				
	D3	D2	D1	D0	M11	M12	M21	M22	
5	0	1	0	1	0	0	0	0	Stop
4	0	1	0	0	1	0	0	0	Left
6	0	1	1	0	0	0	1	0	Right
2	0	0	1	0	1	0	1	0	Forward
8	1	0	0	0	0	1	0	1	Backward

### 4 BLOCK DIAGRAM



### 4.1 Remote Section

This section's main component is DTMF. Here we get a tone from our cell phone by using aux wire to DTMF Decoder IC namely MT8870 which decodes the tone into digital signal of 4bit.

### 4.2 Control Section

Arduino UNO is used for controlling whole the process of robot. Arduino reads commands sent by DTMF Decoder and compare with define code or pattern. If commands are match arduino sends respective command to driver section.

### 4.3 Driver Section

Driver section consists motor driver and two DC motors. Motor driver is used for driving motors because arduino does not supply enough voltage and current to motor. So we add a motor driver circuit to get enough voltage and current for motor. By collecting commands from arduino motor driver drive motor according to commands.[3]

## 5 ADVANTAGES & DISADVANTAGES

### 5.1 Advantages

- Can be operated by sitting any where without any frequency limitation
- Can detect obstacle and avoid collision.
- Instead of using multiple cameras we can use a movable spy robot.

### 5.2 Disadvantages

- The night vision camera we are using have limited range which can be over come by using IC camera in future.

## 4 CONCLUSION

By developing this robotic vehicle with its multi-tasking feature, the drawbacks have been overcome of that seen in RF communication based robots which had a limited range where in this vehicle can be controlled from anywhere by usage of DTMF technology. Considering all the situations this can be used for surveillance and military applications with the help of installing the camera.[4]

## REFERENCES

- [1] <https://www.arduino.cc/en/Guide/Introduction>
- [2] <http://searchnetworking.techtarget.com/definition/DTMF>
- [3] <http://nevonprojects.com/long-range-spy-robot-with-night-vision/>
- [4] <http://www.irjes.com/Papers/vol4-issue5/C451217.pdf>