# Design And Implementation of IoT based Robotic car for Surveillance

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***Abstract-*** *The proposed framework has structure and improvement of a brilliant robot vehicle which incorporates remote camera recognizing alive people with sensors for harmful gases, metals, obstacles at remote territories and it sends data to fundamental area with the assistance Blynk software through manually. This robot framework has sensors that can send alert to the client when any unusual appearance is found inside the range. The robot is capable to record the real-time streaming in day time and night time as well through wireless camera. In manual mode, client imparts sign to robot vehicle utilizing Blynk software. The encompassing can be seen and headings can be changed through camera. With the assistance of amplifier in the remote camera, the client could hear the discussion of the people at the fringe regions by the help of Wireless camera with Microphone.*

***Keywords***- Blynk software, surveillance

## I. INTRODUCTION

Blynk is a comprehensive software suite that enables the prototyping, deployment, and remote management of connected electronic devices at any scale.Whether it's personal IoT projects or commercial connected products in the millions, Blynk empowers users to connect their hardware to the cloud and create iOS, Android, and web applications, analyze real-time and historical data from devices, remotely control them from anywhere, receive important notifications, and much more. In this proposed system, we have a robot car for surveillance or security purpose and a controlling and monitoring system by using Arduino UNO. It consists of robot car, camera and a few sensors, LCD display, monitor, DC motor, GPS Module and Motor Drivers. This robot car can be operated in manual. Camera will be operated in same manner. In manual mode, the movement of the robot car will be decided by the obstacle detection sensor in the car.

## II. METHODOLOGY

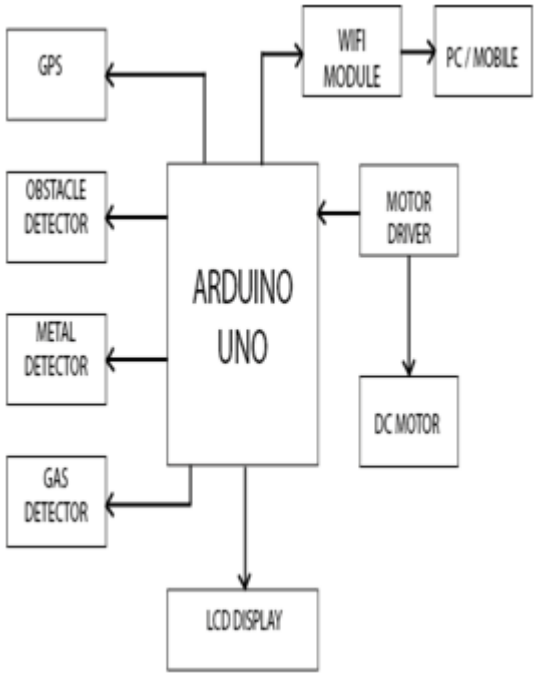


Fig: Block diagram of a robotic car

The block diagram of the vehicle side shown in the figure , has ATMEGA 328, motor drive, wireless camera, GPS module, Gas Sensor, Proximity Sensor, Ultrasonic Sensor, LCD Display and WiFi Module. The detectors and the camera will be working in both modes of operation. But the motor drive will be operated differently in manual mode. The motor drive will be operated by user in manual mode. In manual mode of operation, the camera will show the live video recordings to the user to control the robot car in any needed situation. The microphone that has been attached to the camera will help us to hear the audio in the video recorded by the camera.

ESP32-CAM doesn't have a USB connector, so you need an FTDI board to upload the code into ESP32-CAM. VCC and GND pin of ESP32 is connected with the VCC and GND pin of the FTDI board. Tx of and Rx of ESP32 is connected with Rx and Tx of the FTDI board. Two DC motors

are connected to ESP32 through the L293D module. Module pins are connected to IO4, IO2, IO14, and IO15 pins of ESP32.

## III. IMPLEMENTATION OF BYLNK SOFTWARE

This system uses Blynk, it is an IoT platform for iOS or Android smartphones that is used to control Arduino, Raspberry Pi and Node MCU via the Internet. Blynk was designed for the Internet of Things.

It can control hardware remotely, it can display sensor data, it can store data, visualize it and do many other cool things.
There are three major components in the platform:

**Blynk App** - allows to you create amazing interfaces for your projects using various widgets we provide.

**Blynk Server** - responsible for all the communications between the smartphone and hardware. You can use our Blynk Cloud or run your private Blynk server locally. It's open-source, could easily handle thousands of devices and can even be launched on a Raspberry Pi.
**Blynk Libraries** - for all the popular hardware platforms - enable communication with the server and process all the incoming and outcoming commands.

The process that occurs when someone presses the Button in the Blynk application is that the data will move to Blynk Cloud, where data magically finds its way to the hardware that has been installed. It works in the opposite direction and everything happens in a blink of an eye.
The below figure shows the combination of Blynk App, Blynk Server and Blynk Libraries.

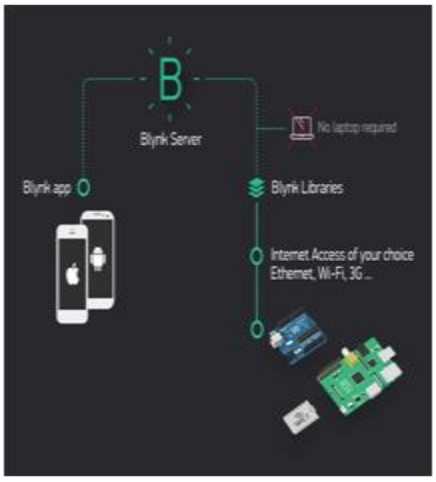


**Figure: Bylnk software**

**Features**

- Similar API & UI for all supported hardware & devices.
- Connection to the cloud using WiFi, Bluetooth, BLE, Ethernet, USB(Serial) and GSM.
- Set of easy-to-use Widgets.
- Direct pin manipulation with no code writing.
- Easy to integrate and add new functionality using virtual pins.
- History data monitoring via Super Chart widget.
- Device-to-Device communication using Bridge Widget.
- Sending emails, tweets, push notifications, etc.

## IV. HARDWARE IMPLEMENTATION

The Robot Car consists of various sensors along with wireless camera for surveillance and security purpose. This Robot car is implemented using kit. They are controlling side kit, which is Blynk app used for the controlling of the kit. The controlling side kit will be with user, who has been viewing all the information that has received in the controller kit. The sensors and the camera in the Robot Car will collect all the information from the sensors such as any metal detection from the proximity sensor, any gas detection from the gas detecting sensor and any obstacles from the ultrasonic sensor.


**Fig:Top view of robotic car**

## V. RESULT

In this, all the sensors will be activated only if there is an object or a hazardous thing that has been detected by the sensors. Once these sensors got activated, by detecting any anonymous things. Whenever any sensors get activated, the Blynk app will alert and deliver the appropriate signal message to the user. The wireless camera will be continuously sending live video recordings to the user. The movement and direction in which the Robot Car has to run depends on the

user to operate manually, which user can detect any obstacles in front of the car, so that the user can switch vehicle to move freely without any damage to the car and the camera. The sensors and the camera in the vehicle work in same condition by the operation of the user side. Here, the obstacle detecting sensor (ultrasonic sensor) will not directing the vehicle's movement. However, all the other sensors including ultrasonic sensor will be continuously transmitting signals to the user through the Blynk app will work according to the transmitted signals from the Vehicle.

## VI .CONCLUSION

The essential point of the surveillance robot is that it has he various capabilities of detecting and sending the signals to the authorised user from different environments. Depending on the sensor data of the robot, it provides the information to the user to move the robot in the desired direction properly like left, right, forward and backwards. It can sense various objects and also things coming towards it. It shows proper live streaming of video contents. Every sensor has the capability to work on different aspects like detecting gas, live human detection. The robot can be easily controlled from outside environment with the help of any android device and laptops. This project is very beneficial and convenient for the places where human access is impossible and life threatening.

## VII. FUTURE SCOPE

There are lots of improvements that can be made on the current design and technology and lots of additional feature scan be added. We can use different types of sensor so that we can use robot in different field i.e. Temperature Sensor, Pressure Sensor, Heat Sensor, Position Sensor, Proximity Sensor. A multipurpose robot can be made by wireless network, ranging from surveillance and home security to industrial applications where the user need not be present at the work place in person but can do it from his home itself.

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