**IOT PROJECT**

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**SYNOPSIS**

**IOT ENABLED ROBOTIC CAR**

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**INTRODUCTION**

Internet of Things (IOT) is a new revolution of the Internet. It enable to connect remote and mobile things or machines or assets through the use of wireless communications and low-cost sensors, computing and storage devices.

This project shows how to use Internet of Things (IOT) for controlling Robotic car remotely (anywhere), provided that your robot is connected to the Internet.

**USES OF THIS PROJECT**

The Internet is now advancing from a network of computers to a network of things**.** IOT has huge application area such as traffic monitoring, smart homes, smart parking management, vehicle tracking system and other industrial applications etc. Robotic car is used to achieve high degree of precise path control from the user side to achieve standard operations like moving at a particular target location, collecting data and avoiding any obstacle to prevent collision

**OVERVIEW**

The overall framework should contain a user, an Android smartphone field, an Arduino based car with assistance of the Arduino integrated development environment (IDE) in the PC, sketches are compiled and uploaded into the Arduino board via a USB transmission line .The car and mobile phone are linked via wireless communication. By touching or pressing on the screen of an Android phone, a manipulator can send commands to the Arduino microcontroller on the car through WiFi and observe the corresponding executions accomplished by actuators, for example motors. Two gear motors, two wheels, a battery holder, batteries, a switch and a baseboard compose the chassis of the car. Uncomplicated operations and compact user interfaces are preferred. Initially the commands include: move forward, move backward, turn left, turn right, rotate left, rotate right, activate obstacle detection, and deactivate obstacle detection. These commands can be given via user application. It is possible to locate the car continuously in the UI and get the feedback and data regarding to the car .There is a provision of feedback signals to the controlling device like mobile in which the graphical control interface is installed thus avoiding collision and changing of path is very easy in our design.

**EXISTING SYSTEM**

The proposed system will have the following components:

1-ESP8266 (Node MCU)

2-L298N Motor Drive Module

3-Arduino UNO

4-Robot Chassis

5-4 \* 5V Geared Motor

6-Connecting Wires

7-Power Supply (or battery)

**WORKING**

**1 - Sending command** -The mode of sending command to the car is by manually clicking buttons visible in the user interface which is the android application developed in the android studio with buttons controlling movements like move forward and backward, turn right and left, stop, pick and drop.

**2 - Checks for command validation**- On successful decoding the dedicated event handlers take care of the rest of the task. But on unsuccessful decoding the client is requested to generate any command from the set of valid commands. This request is in actual a message displayed on the user interface of the application.

**3. Stores commands in a cloud service** - Queue provides a well-defined and flexible service to this system. As both car information and commands are needed to be transferred at the desired places or devices and at the same time, so two queues were used- one for data and another for command. The arduino in the car listens to the Command Queue and it sends data to the Data Queue. On the other hand the android application in the controller end listens to the Data Queue and it sends command to the Command Queue.

**4 - Processor (Mobile) collects the command and passes to the Arduino**- There are basically four modes of command signals that the Arduino receives from the processor. These are:

A- Move according to the command signals sent by the user,

B-pick and drop any object,

C-To send GPS sensor values acquired from the GPS,

D-To send the data received from the obstacle detector.

**5 - Arduino takes action according to the command**- Based on the command received Arduino takes appropriate action. For example: acquiring GPS sensor value, acquiring obstacle sensor reading and changing the car’s direction of motion or state. The GPS sensor continuously pings for getting the actual location of the car. Arduino also pings the IR obstacle sensor for distance of obstacle before the car. Based on the commands, Arduino changes the direction and speed of the motors using the motor controllers.

**6 - Updates GPS position of the car-** Whenever the Robotic Car is commanded to change its position, Arduino polls the GPS sensor to get the updated GPS position and then when it is commanded to send the GPS position then this location is sent to the Data queue of the cloud service bus. This data is later received by the android application which updates the UI accordingly.

**7 - Surveillance camera provides visual track of the robotic car**- the robotic car here is equipped with a surveillance camera which enables the user to be aware of the motion of the car and the environment in which the car is being operated.

**LEFT MOTORS RIGHT MOTORS** **OUTCOME**

Forward Forward Forward

Forward Static Left

Static Forward Right

Backward Backward Backward

**FUTURE SCOPE**

In this paper an efficient control system of a robotic car is incorporated with IOT. The cloud service helps the system to reduce memory load. Stored messages are automatically removed after a certain amount of time. The performance results prove that if the incorporation is efficient. The wireless range is too small. It can be efficient if GPRS, module is used for wireless medium. Including object detection method is one of the main future works that needs to be implemented.