



IMPLEMENTATION OF SMART TRANSPORTATION, SMART PARKING AND VEHICLE POLLUTION EMISSION DETECTION USING ARDUINO FOR SMART CITY

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ABSTRACT

The Internet of Things (IOT) shall be able to incorporate transparently and seamlessly a large number of different and heterogeneous end systems, while providing open access to selected subsets of data for the development of various digital services. Due to resource constraints, there will be a problem in the future to provide all the services to the residents. To continue to serve and improve the standard of living of the growing population, it is necessary to develop smart cities. Urban IoTs, in fact, are designed to support the Smart City vision, which aims at exploiting the most advanced communication technologies to support added-value services for the administration of the city and for the citizens. In recent years popularity of private cars is getting urban traffic more and more crowded. As result traffic is becoming one of important problems in big cities in all over the world. Some of the traffic concerns are congestions and accidents which have caused a huge waste of time, property damage and environmental pollution. This project implements the way for smart parking and transportation system which aims to efficient traffic control in a user friendly manner by using radio frequency identification(RFID) and vehicle pollution detection by using sensors .



INTRODUCTION

In recent years popularity of private cars is getting urban traffic more and more crowded. As result traffic is becoming one of important problems in big cities in all over the world. Some of the traffic concerns are congestions and accidents which have caused a huge waste of time, property damage and environmental pollution. This research paper presents a novel intelligent traffic administration system, based on Internet of Things, which is featured by low cost, high scalability, high compatibility, easy to upgrade, to replace traditional traffic management system and the proposed system can improve road traffic tremendously.

The Internet of Things is based on the Internet, network wireless sensing and detection technologies to realize the intelligent recognition on the tagged traffic object, tracking, monitoring, managing and processed automatically. This research proposes to employ the IoT, agent and other technologies to improve traffic conditions and relieve the traffic pressure. Information generated by traffic IoT and collected on all roads can be presented to travelers and other users. The system may issue some latest real-time traffic information that helps drivers choosing optimal routes.

This system makes the transportation service more effective by automatically identifying the traffic density of the road which can be used for the travellers to find the best path to the destination in emergencies. With the help of this project pollution checking in our own vehicle is possible without any burden and it makes the transportation system more efficient with the help of RFID.

SMART TRANSPORTATION BY MEASURING THE VEHICLE DENSITY

In Existing System, an autonomous vehicle controller needs to be employed to allow the vehicle to reach the desired destination using signals for heavy traffic areas. Here signals



are used to instruct the travellers to the appropriate path in order to reduce the traffic congestion. The three types of colors are used for the indication. Red signal is used to indicate the stop action. Green is used to indicate start moving, yellow is used to indicate wait and orange is used to indicate get ready. Based on these signals the traffic controller controls the traffic. These signals are based on the time duration. It is impossible for the user to choose the best path with less traffic.

To overcome the drawbacks of the existing traffic management system, new and innovative transportation solutions are proposed based on IOT. If there is more than one path to reach the desired location. The sensors are placed on each road. Whenever the vehicle enters into the road sensor can sense and the vehicle count is taken continuously. Based on this vehicle count the signals are placed. The entire system is controlled by ARDUINO microcontroller. Using these signals users can choose the appropriate path with less traffic.

POLLUTION DETECTION BY MEASURING THE CO₂ EMISSION

There is no easy approach to detecting the pollution level in our own vehicle. The vehicle pollution is checked in pollution control board there is no self-regulatory mechanism to identify the pollution level in our own vehicle. CO₂ is one of the dangerous gases which causes some of the environmental hazards and is injurious to human health. This project mainly focuses on the emission of CO₂.

The CO₂ sensor is used to identify the emission of CO₂ from the vehicle. The coding area is imported in the Arduino's storage space atmega. The normal level of the emission is imported into it. Whenever the emission exceeds the normal level the buzzer will ring. The entire system is placed in the vehicle. Based on this buzzer ring the emission level is identified.



SMART PARKING SYSTEM WITH THE HELP OF RFID

In Existing System an autonomous vehicle controller needs to be employed to allow the vehicle to reach the desired destination using signals for heavy traffic areas. This System concentrates on the traffic clearance. The existing system concentrates on the traffic clearance. When the vehicle parked in the noparking area the traffic controller immediately seize our vehicle without the knowledge of the user.

The smart parking system is made user friendly. When the vehicle parked in the noparking area , the traffic controller pass the information to the vehicle owner to remove the car from the noparking area. This approach is done by RFID technology. The RFID tag is placed in the vehicle's number plate. The user's personal information such as phone number, name , address is stored in the controller. RFID tag is the interface which is used to get the information by using RFID reader .

Whenever the traffic controller see the vehicle which is placed in the noparking area the traffic controller read the user information from the RFID tag by using the RFID reader and with the help of GSM Module it automatically send the message to the vehicle owner with the indication to remove that vehicle. This approach gives some time and chance to users to getback their vehicle without fine.



```
prema_rfid | Arduino 1.6.8
File Edit Sketch Tools Help
prema_rfid
#include <SPI.h>
#include <MFRC522.h>
#define SS_PIN 10
#define RST_PIN 9
String k="";
MFRC522 rfid(SS_PIN, RST_PIN);
MFRC522::MIFARE_Key key;
// Init array that will store the UID
byte nuidPICC[4];
void setup() {
  Serial.begin(9600);
  SPI.begin(); // Init SPI bus
  rfid.PCD_Init(); // Init MFRC522
  for (byte i = 0; i < 4; i++)
    key.keyByte[i] = 0xFF;
}
void loop() {
  // Look for new cards
  if (rfid.PICC_ReadAndCache(nuidPICC)) {
    Serial.println("Card read successfully");
    Serial.println("UID:");
    for (byte i = 0; i < 4; i++)
      Serial.print(nuidPICC[i], HEX);
      Serial.print(" ");
    Serial.println();
    Serial.println("sending sms to user");
  }
}
```

COM5
22877148184
sending sms to user

Error opening serial port 'COM5'. (Port busy)
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Error opening serial port 'COM5'. (Port busy)
Error opening serial port 'COM5'. (Port busy)

Updates available for some of your boards and libraries

CONCLUSION&FUTURE ENHANCEMENT

Conclusion

Implementation of Smart Vehicle Transportation and parking , vehicle pollution detection system using Internet of Things had been proposed.The proposed schemes very suitable for real time vehicle management.However, there are a number of issues to be addressed before the solution can be tested and applied to real-life problems such as heterogeneity of devices, concurrency of the services, responding times, data volume, human factors, and intelligence recommendations. In this project the above parameters are tested by using small modules.It aims to solve the problem of real-time monitoring road vehicles in traffic management and vehicle pollution detection in the easy manner and making the parking services more convenient to the user. It overcomes the inherent



shortcomings of existing traffic management systems, and will compose of a part of traffic IOT to support a wide range of intelligent traffic management applications in the future. In future the same project can be made available in Smart device likes Tablet and mobiles so that it can be easily used anywhere.

Future enhancements

The vehicle count module for the smart transportation is made only for the one way route. In future the smart transportation module can be made for the broad roads.

In pollution detection, the CO_2 emission is calculated in petroleum products. In Future, other poissioness gas can be measured and the pollution range of CO_2 ismeasured in the LPG also.

