Hit and Run Vehicle Identification Using RFID

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ABSTRACT

The vehicle's usage in this busy world has been increased. There is an increased possibility for accident to occur due to lack of traffic awareness. The rules have to be followed strictly to avoid such critical situations. But, the urge for following those rules is not inculcated. So there are some possibilities of hit and run incidents to occur periodically. This is to avoid being caught by the laws and imprisonments. In order to identify the culprit, we are using the RFID systems. The tag from the culprit's car is scanned by the RFID reader placed in the victim's car. Hence the information gets collected and it is sent to the registered number through GSM module. Thus the case can be filed and the culprit can be found within a short duration of time.

INTRODUCTION

In recent days, the number of accidents is being increased. This is due to the traffic violations which is common nowadays. Every user must be taught of the rules before they become a professional vehicle handler. This project is based on the concept of RFID. Each vehicle has its own tag and a reader. The tag is of two types. They are active and passive RFID tags. A passive tag requires line of sight and hence the tag must be placed near to the reader. But the active tag does not require line of sight and hence the reader can detect the tag up to a distance of 100 meters. Thus we use an active tag in each vehicle. When two cars colloid, the reader from the victim's car scans the tag in the culprit's car and sends the information to the registered location via GSM. This helps in identifying the culprit and to take legal actions.

CURRENT ISSUES

There is an increased probability of hit and run in recent days. This has become a serious issue which violates the rules and regulations that are laid by the government. As a result, there is an increase in number of death due to accident. It shows the reduced loyalty among the people in modern word.

The core theme of this paper is :

1) To track the culprit's vehicle that has involved in hit and run.
2) To file the case and to take necessary action.
3) To get compensation for the damage.
4) To reduce the hit and run chases.
5) To increase the probability of surviving as the information is sent immediately.

LITERATURE SURVEY

a).RFID based automated toll collection system

We come to know that currently there is an implementation of automated toll system. It uses RFID tag for the purpose of detection by the reader. The user has to maintain certain level of amount in his tag so that when the vehicle crosses the toll, the amount gets detected automatically. Here the vehicles do not need to wait or stop at the toll booth.

b).Security System for Vehicle using Number Plate Detection and Radio Frequency Identification (RFID)

Here the vehicle's number plate is sensed by the camera. It is compared with the database that is done in the MATLAB. During this comparison it uses a edge detection and compares pixel to pixel formats that are already define in the program. After matching the number plate it request for the RFID tag. For this purpose, the RF receiver is also connected with it and when RFID tag is shown before the RF receiver it detects its information and matches with the ID that is already stored in the database.

EXISTING METHOD

The automatic toll collection is implemented in India to reduce the traffic and the time in toll booths. The vehicles are implemented with a RFID tag. This tag consists of the information about the vehicle and the owner and also the amount that is fed. When the vehicle moves to the toll, the reader reads the tag and deduces the toll fee automatically. This reduces the waiting time.

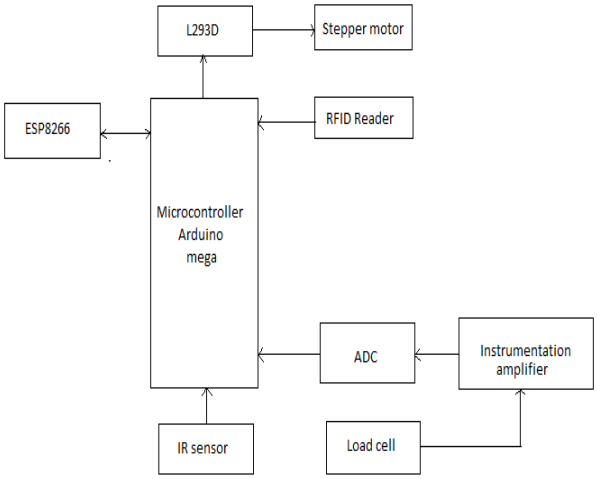


fig. automatic toll collection unit

PROPOSED METHOD

Similar to the automatic toll system, a tag with a reader is fixed in each vehicle. When two cars colloids, the reader from a car scans the tag placed on another car. The information that is collected from that tag will be sent to the desired location through

GSM. We can also use zig-bee mechanism instead of GSM to make the information even more detailed.

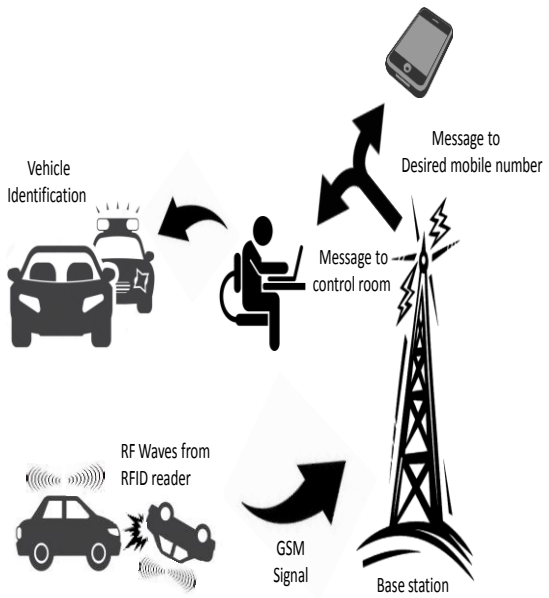


Fig. Vehicle identification system

WORKING PROTOTYPE

This system comprises of RFID reader and RFID tag for each vehicle to provide different RFID number to each vehicle. This system consists of vibration sensor (piezoelectric plate) for sensing vibration during collision. Piezoelectric sensors are placed in the front part of vehicle to detect vibration during collision. When collision occur two vehicles strikes and the vibration sensors of respective vehicles get sensed. This sense produces electrical signal in piezoelectric sensors. The vibration sensor gives input to Arduino Uno through its analog pin. Now the Arduino enables the RFID reader. RFID reader reads the RFID tag of the another vehicle. Hence both the vehicles exchange the RFID numbers and store it in the controller. This information can be used by vehicle owner to register the case if required. The user can claim for compensation from the culprit if required. Once the case is registered, the vehicle is placed in the black list in central server unit. So that whenever culprit arrives at toll plaza CSU sends message to TCU and indicates it to not to allow the vehicle to pass through.

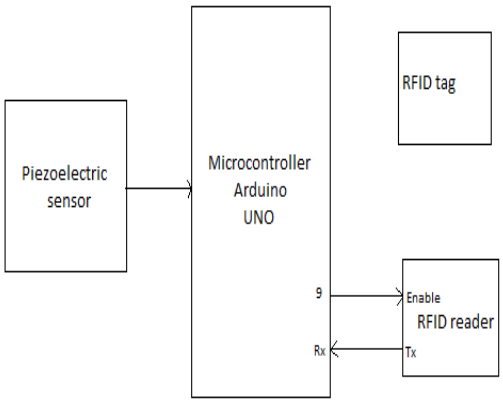
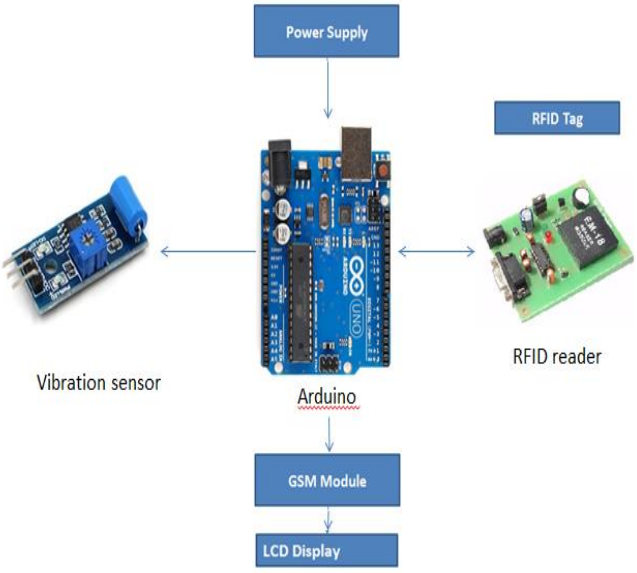


Fig. Vehicle detection unit

PICTORIAL REPRESENTATION



When two vehicles gets colloided, both vehicles are vibrated and the vibration sensor gets activated. This signal is sent to the arduino and it sends an indiation to the RFID reader. Now the reader from the car which has been hit scans the tag that is placed in the car that has been escaped from the spot. The tag consists of respective vehicle number and name of the owner. This information which has been scanned gets transferred from the GSM module to the destination number. The destination may be the mobile number of a family member or some emergency contacts like police or ambulance.

OUTPUT

The reader reads the tag that is placed in the opposite vehicle. It extracts the information from that tag and sends it to the GSM module. The mobile number which has been fed in the arduino, receives the information about the car and its owner.

I. ARDUINO

Arduino Uno is a microcontroller board based on the ATmega328P. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz quartz crystal, a USB connection, a power jack, an ICSP header and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it witha AC-to-DC adapter or battery to get started.

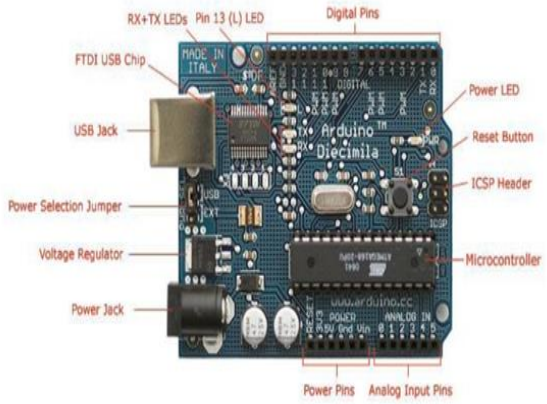


Fig. Arduino UNO

II. VIBRATION SENSOR

It works on the principle electromechanical. The vibration sensors operate in accordance with the electro dynamic principle. They are used for measuring the bearing absolute vibration based on the piezoelectric effect. If there is any change in resistance due to the force acting on it, it converts them into 4 - 20 mA. They have measuring differences in oscillation, so they want a -12v and +12v swing with 0 as the base line we have piezoelectric sensor which detects the vibration created on a ground area or ground surface. We can also use another sensor called shock sensor to detect vibration.

Fig. Vibration sensor

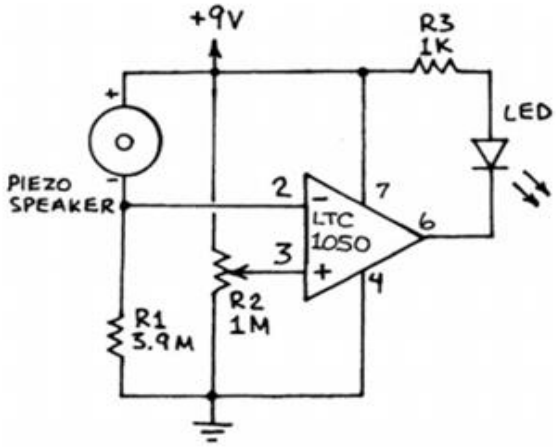


Fig. Circuit diagram of vibration sensor

III. RFID READER

The RFID reader reads the radio waves that are emitted from the tag. There are two types of RFID tags. They are active tag and passive tag. Active tag does not require line of sight as they can scan a tag which is placed up to a distance of 100 meters. Passive tag can be recognized only when they are placed near the reader. This turns out to be a major disadvantage in using passive radio frequency reader.

Fig. RFID reader

CONCLUSION

Thus we have extracted the details of the vehicle which has involved in the accident. The extracted details have been sent to the desired location i.e., the mobile number which is fed into the GSM module. The message that contains the details of the vehicle can be sent to a family member or an emergency number such as police and ambulance. Thus we have extracted the details of the vehicle which has involved in the accident. The extracted details have been sent to the desired location i.e., the mobile number which is fed into the GSM module. The message that contains the details of the vehicle can be sent to a family member or an emergency number such as police and ambulance

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