International Journal of Scientific Research in Engineering and Management (IJSREM)
Volume: 07 Issue: 03 | April - 2023 Impact Factor: 8.176 ISSN: 2582-3930

Vehicle Speed Controller in Restricted Area

Anuj Sharma[1], Anurag Jha[2], Ayush Deshmukh[3], Kunal Divya[4], Saket Sahu[5]

Undergraduate [1,2,3,4,5]

Ms. Simardeep Kaur

Assistant Professor

Department of Electrical Engineering, Shri Shankaracharya Technical Campus, junwani, Bhilai, C.G, India

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Abstract- Speeding violations are one of the leading causes of traffic accidents in Malaysia. This project proposes traffic monitoring and control using RFID technology to reduce crime. AES cameras are installed at fixed points to capture vehicles exceeding the speed limit in Malaysia. After a while, the driver will remember the location of the AES camera. This can lead to a very dangerous situation. For example, when drivers approach a police station, they slow down and do not accelerate until they pass the control area. RFID readers using Ultra High Frequency (UHF) can easily scan tags up to 100 meters long. Therefore, RFID readers can be installed away from the road, making it difficult for drivers to see the police in the area. This is why I love RFID technology after discussion and research. In this project, he will show how to collect data from the RFID reader every time a car passes through the RFID reader. Start the time when the vehicle passes the starting RFID reader and stop the time when the vehicle stops the RFID reader. The speed be calculated according to the time difference. If the measured speed exceeds the speed limit, an audible warning is given and a message is sent to the driver.

***Key Words*: *RFID, AES Cameras, Ultra High Frequency* .**

1. INTRODUCTION

Speeding, reckless driving, illegal driving, not understanding traffic signals, driver fatigue and alcohol consumption are the main causes of road accidents. So, we started to think about how to reduce them. At first, we have an idea of knowing the speed of the car using an ultrasonic sensor. Disabled driving makes city streets unsafe. Reckless driving and speeding are common traffic offenses today. Bad driving shows the mind of the driver. Psychologists say bad driving is seen and bad drivers risk becoming a character. The number of accidents is increasing every year, as there are more cars on the ground. As the car accelerates, the height of the retarder increases. However, its use is not practical or efficient. First, we choose an infrared (IR) module for this task, but there are disadvantages to using this module. It works in line of sight, so I finally decided to use the RF module. The components of the radio frequency (RF) module are an RF transmitter and an RF receiver (Figure 1). Speeding, reckless driving, illegal driving, not understanding traffic signals, driver fatigue and alcohol consumption are the main causes of road accidents. So, we started to think about how to reduce them. At first, we have an idea of knowing the speed of the car using an ultrasonic sensor transmitter should be placed in restricted areas and RF receivers should be placed inside the vehicle. Information is sent to the controller and the current speed is monitored by a separate module or using an ultrasonic sensor that sends the information to the controller. The controller compares the vehicle speed with the speed limit. If the speed of the car exceeds the speed limit, the driver does not need to reduce the speed, the speed can be controlled. In the event of an emergency, the vehicle has a key. As the car accelerates, the height of the retarder increases. However, its use is not practical or efficient. First, we choose an infrared (IR) module for this task, but there are disadvantages to using this module. It works in line of sight, so I finally decided to use the RF module. The components of *the radio* frequency (RF) module are an RF transmitter and an RF receiver (Figure 1). When someone turns on the key, the RF module does not work for a particular car, so the speed is controlled by the driver himself, and the car number is stored in the cloud (blynk) to track the car's road blynk app using the car's road blynk app. With this application, each car will generate its own license plate number. So, we can easily track the car by its ID. RF transmitters should be placed in restricted areas and RF receivers should be placed inside the vehicle. Information is sent to the controller and the current speed is monitored by a separate module or using an ultrasonic sensor that sends the information to the controller. The controller compares the vehicle speed with the speed limit. If the speed of the car exceeds the speed limit, the driver does not need to reduce the speed, the speed can be controlled. In the event of an emergency, the vehicle has a key. When someone turns on the key, the RF module does not work for a particular car, so the speed is controlled by the driver himself, and the car number is stored in the cloud (blynk) to track the car's road blynk app using the car's road blynk app. With this application, each car will generate its own license plate number. So, we can easily track the car by ID.

2. LITERATURE REVIEW

Roberto Cabrera-Cosetletal (2009) on his research demonstrates the human knowledge based fuzzy models to make decision in the problem of automatic car parking on scale model of an automatic car with satisfactory results. Author generated models and training interface in MATLAB and its outcomes are a text file containing the fuzzy models, which sends to the car successfully to execute the parking action. Author also demonstrated the utility and efficiency of the linguistics models used to implement real solution of complex systems and the facility in the technological implementation in this article.

Jarrod M Snider (2009) derives, implements, tunes and compares selected path tracking methods. The importance of modeling vehicle and path dynamics is highlighted as vehicle speed is increased and paths become more varying.

Yuwei Chen et al. (2011) analyzed the suspension, Steering and braking system combined over integrated vehicle dynamics and his investigation has been focused on coordinating the interactions and function conflicts between the steering system and the suspension system by using amultivariablecontrolapproach(stochasticsub-optimalcontrolstrategy).Author also demonstrates Simulation results which shows that the integrated control system is effective in improving the overall vehicle performance including handling, lateral stability, and ride comfort, compared to either the EPS-only system or the ASS-only system ,and the passive system.

Faheemetal.(2013),analyze different Intelligent Parking Services for parking guidance , parking facility management and gives an insight into the economic analysis project. It may reduce the problems arise due to non-availability of a reliable, efficient and modern parking system. It also helps in preserving the environment by reducing fuel and time.

Yatin Jog et al. (2015) has suggested smart parking views over Automated parking. Author described the smart parking solution is to enable both drivers and parking managers in optimizing parking capacity with car sensors, wireless communications data analytics. Author discusses on Wireless Sensor Networks, RFID Technology, using GSM and RFID, QR code-based Vehicle Parking System, Multi-level Car Parking System using Image Processing in this article

3. METHODOLOGY

When the microcontroller receives this 12-digit code, it compares it with the 12-digit code registered in the microcontroller's database. If the number matches the number in the file, the microcontroller knows it's a valid code. It also knows the speed limit that must be followed in the area specified on the label. Then change the speed of the car accordingly. In this form, the drive is supplied by a 12 V DC motor. The speed of the motor is controlled by pulse width modulation (PWM) technique. During normal operation, the speed of the is controlled by the acceleration unit. The *acceleration unit* used here is a variable resistor. As the resistance of the accelerator changes, the DC input voltage to the pulse width modulator also changes, thus changing the width of the output pulse. Pulse Width Modulation is the process of changing the output pulse *level width* by changing the DC voltage applied to the comparator as one of the inputs. Another idea is the sawtooth voltage waveform. The width of the output pulse decreases or increases as the DC reference voltage increases or decreases. This pulse generated by PWM is given to the motor driver to control the speed of the motor. When the pulse width is large, the motor speed increases, and when the pulse width is small, the motor speed decreases. The motor driver is a MOSFET switch that turns on and off depending on the gate voltage. When the gate voltage is high, the MOSFET turns on, connecting the motor to power and ground, and when the gate voltage is low, the MOSFET turns off. The high and low voltages of the gate are obtained by PWM pulses.

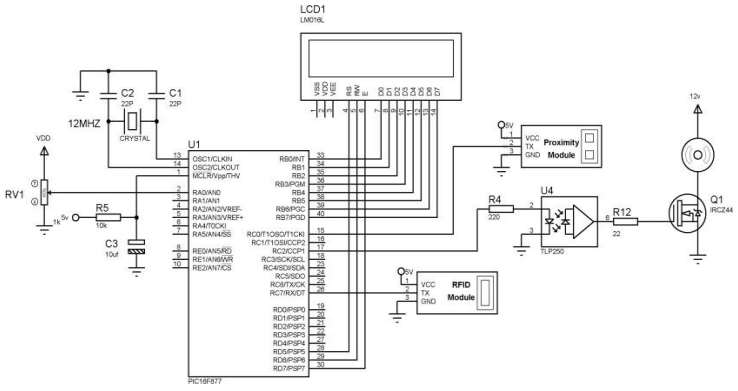

Figure 5: Circuit Diagram

4. PROJECT DESCRIPTION

4.1 RFID

Radio Frequency Identification (RFID) is an electronic device that sends and receives radio signals between two devices. In embedded systems it is often necessary to send data wirelessly to other devices. Radio frequency communication includes transmitters and receivers. They come in many shapes and sizes. Some can send signals up to 500 feet. The frequency range is between 30 kHz and 300 kHz. Deployment of RF modules is preferred over IR modules for many reasons. RF signals can travel long distances, making them suitable for remote use. We can say that most of the IR works in line of sight, but even if there is a problem between the transmitter and the receiver, the RF signal can propagate. Compared with IR communication, RF communication is powerful and reliable.

4.2 RF Transmitter

The RF module has an antenna that transmits the signal to the source. A radio frequency transmitter is a module that can send radio waves into space. It works with microcontrollers. Here, the microcontroller gives the data to the module to be sent. The transmitter receives the data in serial form and sends the serial data wirelessly through its antenna. The output power output will decrease due to the change of the physical environment, such as distortion, noise and some adverse issues. Therefore, it is necessary to take some measures to solve these problems in order to improve or maintain export quality.

4.3 RF Receiver

The transmitted data (RF signal) is received by the RF receiver. The frequency that appears on the transmitter should appear on the receiver. The modulated RF signal is received by the RF receiver and the received data is demodulated. Two types of receiver modules are available. The first is a superheterodyne receiver and the second is a super-regenerative receiver. An array of amplifiers is used in super regenerative receivers to extract modulated information from the carrier, so they are low cost and low power design. Superheterodyne receivers are the most popular compared to super regenerative receivers. Superheterodyne receiver will improve accuracy and stability of wide range and temperature. This stability is due to its stable crystal structure, which makes the product more expensive.

5. RESULT

This section describes empirical tests on a pilot scheme to validate the control speed recommended in this document. Two tests were carried out: first, to determine the reliability of the detection of *RFID tagged* trains by traveling cars; second, to evaluate the change of control speed according to the path information provided by the signal.

Figure 5: Working Model

6. CONCLUSION

The project will help reduce the number of speed violations and thus reduce the number of accidents. The purpose of the AES system in Malaysia is to reduce traffic accidents due to speeding by imposing fines on drivers who speed. Unfortunately, AES systems are not very effective in reducing accidents due to the size of the AES camera that can be easily seen by the driver. Also, drivers who know where the camera is fixed can use other methods to protect the camera. Therefore, using this project it will be difficult for drivers to know the management area, which will reduce their avoidance of penalties. There are still many improvements and improvements that can be made on this project. One is the number of vehicles that can be passed by the police at a time. In this project, only one vehicle can pass through the control area at a time. This is *to improve* accuracy when calculating the speed of the car, but cannot be done in real conditions. Then increase the distance at which the RFID reader can scan the tags. This project uses MFRC522 to analyze text. The maximum distance for the MFRC522 to scan documents is 3 cm. After using the UHF RFID reader, if the RFID reader is installed away from the road, the RFID reader's scanning distance will increase, making it difficult for the driver's car to recognize the police area.

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