Traffic Violation Detection For Penality System using NFC

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Abstract-

In this project, intelligent control system is capable of tracking all vehicles, crisis management and control, traffic guidance and recording Driving offences along the highway. It needs a traffic control solutions, which are different from the developed Countries. In recent years, wireless networks are widely used in the road transport as the provide more cost effective options. RFID is a wireless technology that uses radio frequency electromagnetic energy to carry information between the RFID tag and RFID reader. This paper presents an intelligent traffic control system to pass emergency vehicles smoothly. Each individual vehicle is equipped with special RFID tag which makes it impossible to remove or destroy. If the RFID-tag-read belongs to the stolen vehicle, then a message is sent using GSM SIM300 to the police control room. If the car is parked in a no parking zone, the system immediately alerts the driver about the penalty for parking violation. If the vehicle crosses the road during red signal, it has been alerted with penalty for traffic violation.

I. INTRODUCTION

The main types of Traffic Violations are 'Moving Violations' and 'Non-Moving Traffic Violations'. Driving offences involving fatalities are 'dangerous driving' and 'careless or inconsiderate driving'. A moving violation can only be issued if the car is in motion. A person drives dangerously when the way they drive falls far below the minimum acceptable standard expected of a competent and careful driver; and it would be obvious to a competent and careful driver that driving in that way would be dangerous.

A. Antennas

The antenna emits radio signals to activate the tag and read and write data to it. Antennas are available in a variety of shapes and sizes; they can be built into a doorframe to receive tag data from persons or things passing through the door, or mounted on an interstate tollbooth to monitor traffic passing by on a freeway. Antennas can also be mounted on mobile devices and under print heads.

B. Readers

Often the antenna is packaged with the transceiver and decoder to become a reader, which can be configured either as a handheld or a fixed-mount device. The reader emits radio waves in ranges of anywhere from one inch to 100 feet or more, depending upon its power output and the radio frequency used. When an RFID tag passes through the electromagnetic zone, it detects the reader's activation signal.

C. Tags

RFID tags can be active, semi-passive (semi-active) or passive Passive RFID tags have no internal power supply. The minute electrical current induced in the antenna by the incoming radio frequency signal provides just enough power for the CMOS integrated circuit (IC) in the tag to power up and transmit a response. Most passive tags signal by backscattering the carrier signal from the reader. This means that the antenna has to be designed to both collect powers from the incoming signal and to transmit the outbound backscatter signal.

D. Software

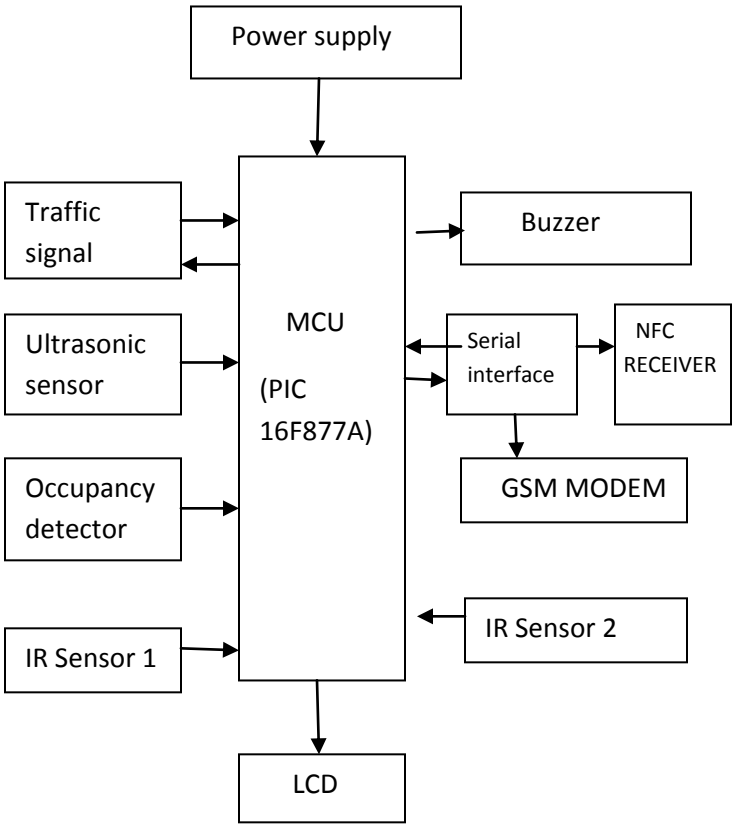
Therefore, genetic algorithm plays a significant role. In this project, the genetic algorithm of artificial intelligence or feedback is used. Genetic algorithms are one of the best ways to solve a problem for which little is known. They are a very general algorithm and so will work well in any search space. All you need to know is what you need the solution to be able to do well, and a genetic algorithm will be able to create a high quality solution. Genetic algorithms use the principles of selection and evolution to produce several solutions to a given problem.

II. EXISTING SYSTEM

Today red light violation is one of the most common and serious problem which results in the collision of millions of vehicles at the traffic light signals every year. A red light violation occurs when a vehicle try to cross the intersection at the red traffic light. So to give the punishment to the drivers of these vehicles, we must identify the vehicle that violates the traffic light signals. Automatic Number Plate Recognition is a technique use image or video picture of license plate and then applies optical character

recognition techniques to extract the number from the image and then use this information to identify the vehicle identity. Under this system the cameras use the infrared signal to allow the camera to take picture at any time of the day .The roads intersection is a bottleneck point in the urban traffic network and it is very critical node. Traffic may accumulate quickly and traffic jam can occur quickly in case the traffic control system is not efficient to properly manage the vehicles queues in fast and smart manner. Electronic Toll Collection system using the Automatic Vehicle Identification (AVI) technique and also discussed the various AVI technologies Image processing AVI system, RF and Microwave AVI system etc

III.PROPOSED SYSTEM



The problem of traffic light violation detection can be solved by RFID based system. With this system, we can consider the priority of different type of vehicles and also consider the density of traffic on the roads by installing RF reader on the road intersections. Radio frequency identification is a technique that uses the radio waves to identify the object uniquely. RFID (Radio Frequency Identification) is one of the new upcoming technologies in the market, which has made its place in many more applications. RFID is basically an identification technique which uses the Radio waves for the identification of objects having RFID tag equipped with them [3]. There are three main components of RFID: RFID tag, RF Reader and Database. Various types of tags are available but we can mainly divide them into two categories: passive tags and active tags. The passive tags don't contain any internal power source. There are three parts of the tag: antenna, semiconductor chip and some form of encapsulation. The RFID tags are used to read the information from the tag and acquire and maintain this information for the application. The reader has an antenna that emits the radio waves. These waves are captured by the antennas of the tags in the range of the reader which amplify this signal and pass it to the microchip to activate the internal circuitry. As a result the tag respond by sending back the data stored in the tag to reader.

Under the proposed work, each intersection contains 8 RFID readers. The road is divided into two lanes. Each lane has its RFID reader to track the vehicles passing through it.

IV. RESULTS

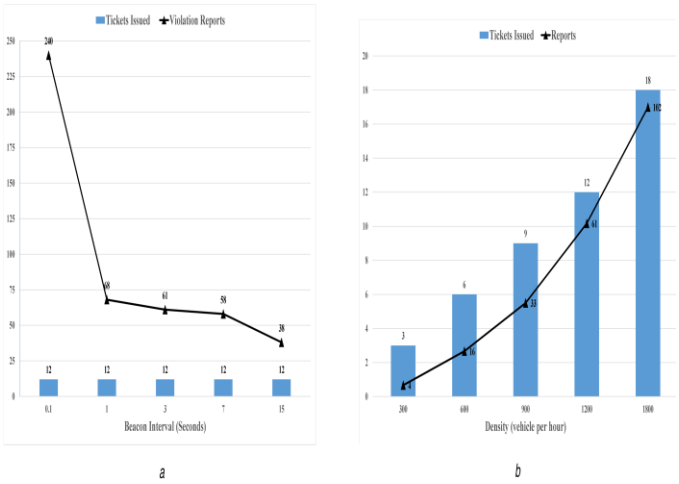
First, we aim to assess the effect of beacon interval and vehicle density on the number witnessed violations and the tickets issued by the TA. Second, we test the model under the influence of adversary vehicles to evaluate the reliability of the ticket issuing mechanism model with colluding vehicles which replay beacons or send false violation reports of the obeying vehicles to the TA. Fig. 4 shows the effects of beacon interval lengths and vehicle density on the number of reported violations of the reporter vehicles and the issued tickets by the TA. The vehicles are assigned with the speeds of 80, and 110 km/h. The first group of vehicles reaches 80 km/h and always travels under the speed limit, 90 km/h, and the second vehicle group reaches up to 110 km/h and exceeds the speed limit on the road. During the simulations, 10% of the randomly chosen vehicles act as speed violators. In order to provide a constant density of vehicles, vehicles do enter the freeway with an even time gap between them. The simulations are run for 10 min at each density level. The results indicate that for each density level, the TA is able to issue tickets to the 98% of the violators even though some violations are witnessed just once at lower densities. Clearly, the conditions that are simulated are ideal. Note that, as the beacon rate increases, more violations are reported to the TA since a witness vehicle is able to observe more location changes of the neighbours in the communication distance. Roughly, the system depends on the number of participants. For this, the percentage of participants is referred to as the *penetration level*. To further evaluate the efficiency of the ticketing model, we run the simulation at different

penetration levels of the reporter vehicles. Fig. 5 shows the results of the simulations at the reporter penetrations of 5–80% with the density of 1200 vehicles/h. Here, a large ratio of participants increase the number of reported violations to TA. In the case of replay attacks, we use a scenario in which between 10 and 90% of the vehicles randomly act as adversaries and replay the messages of their neighbours. As can be seen in Fig. 5, the simulations do not result in any false positive tickets at any penetration level of the adversary vehicles. In these ideal conditions, false negatives are r since a witness vehicle is able to observe more location changes of the neighbors in the communication distance. Roughly, the system depends on the number of participants. For this, the percentage of participants is referred to as the *penetration level*. To further evaluate the efficiency of the ticketing model, we run the simulation at different penetration levels of the reporter vehicles. Fig. 5 shows the results of the simulations at the reporter penetrations of 5–80% with the density of 1200 vehicles/h. Here, a large ratio of participants increases the number of reported violations to TA. In the case of replay attacks, we use a scenario in which between 10 and 90% of the vehicles randomly act as adversaries and replay the messages of their neighbors. As can be seen in Fig. 5, the simulations do not result in any false positive tickets at any penetration level of the adversary vehicles. In these ideal conditions, false negatives are rare too, that is all of the violations are ticketed. For this reason, we randomize the model further as follows. Each car will fluctuate its speed at random times before entering the freeway segment after which, the vehicles move at their initially designated speeds. As it can be seen in Fig. 6, some of the violations, on average 8% of them, are missed at different vehicle density levels. Here, the false negatives are mainly caused as the upstream and the downstream distance between a violator and reporters gets greater than the communication range of the vehicles, hence such violations are not observed at all in the system. Regardless, in reality, a violator needs to slow down strategically in order to avoid any reporting as it approaches downstream reporter vehicles. Such 'strategic' driving intended to avoid violations in a normal setting, is inherently difficult to maintain at high speeds without causing accidents.

In high density levels, the space between vehicles results in congestion in which at times a violator is caught up and prevents it to overtake the slower vehicles in front. This results in the increased ratio of false negatives to higher vehicle densities.

V. CONCLUSION

The proposed system will be Traffic violation detection and penalty system using NFC has been completed successfully and the output results are verified. The results are in line with the expected output. The project has been checked with both software and hardware testing tools. In this work "PIC micro controller, LCD, RFID reader is chosen are proved to be more appropriate for the intended application. The project is having enough avenues for future enhancement. The project is a prototype model that fulfills all the logical requirements. The project with minimal improvements can be directly applicable for real time applications. further paves a road path towards faster development s in the same field. The project is further adaptive towards continuous performance and peripheral up gradations. This work can be applied to variety of industrial and commercial applications.



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