REALTIME TRACKING OF PEDESTRAIN CROSSING VEHICLES USING BEACON

K. Magesh,S.Manoharan,S. Sakthivel, Ms.D.Shankari

Student, ECE, Prince ShriVenkateshwaraPadmavathy Engineering College, Tamilnadu, India
Student, ECE, Prince ShriVenkateshwaraPadmavathy Engineering College, Tamilnadu, India
Student, ECE, Prince ShriVenkateshwaraPadmavathy Engineering College, Tamilnadu, India
Assistant Professor, ECE, Prince ShriVenkateshwaraPadmavathy Engineering College, Tamilnadu, India

ABSTRACT

This paper describes on the vehicles which crossing the pedestrian during stop signal. The paper focuses on SPC (sudden pedestrian cross) detection using beacon module for vehicle tracking. In this the implementation of beacon use BLE (Bluetooth low Energy) for transmitting the signal. Moreover the plan of pedestrian path prediction method based on pedestrian tracking to predicted and be aware of pedestrian intentions in advances for collision avoidance. In particular, pedestrian crossing vehicle during stop signal is becoming an emerging part of an ADAS (Advance Driver Assistance system). The moving vehicle detection is very challenging because of the use of vision camera as there is a wide range of deformable appearances of vehicle through beacon the vehicle are tracked and the person caught.

Keyword:-
Beacon, BLE(Bluetooth Low Energy), Pedestrian detection, ADAS(Advance Driver Assistance System) etc...

1. INTRODUCTION

With advances in intelligent transportation system technologies, the importance of computer vision has been increasing for advanced driver assistance system (ADAS) support. For many years, computer vision for an ADAS has been researched in specific fields such as lane detection, cardetection, drowsiness monitoring, pedestrian detection, and tracking. In particular, pedestrian detection is fast becoming an emerging part of an ADAS owing to the increase in the number of vehicle and pedestrian accidents. However, pedestrian detection from a moving vehicle is very challenging because of the camera movement, a wide range of deformable pedestrian appearances, cluttered backgrounds, and difficult real-time constraints [1]. In addition, the detection of sudden pedestrian crossing (SPC) through an analysis of the pedestrian behavior assumed from the triggering of their motion is a very challenging issue for any ADAS.

1.1 Monitoring Methods

In the existing system, human are used for monitoring the roles breaker during the Traffic signal in stop condition the role breaker can't find easily so the accident is highly possible and the video camera technology used in capturing visible light images is mature and cost effective, and many researchers are therefore using visible light images for pedestrian detection under ideal lighting conditions. Recent studies on pedestrian detection using visible light images are as follows. 1. demonstrated that integral channel features that are multiple registered image channels not only outperform other features, including histogram of oriented gradients (HOG), but also have few parameters and are insensitive to exact parameter settings. They experimentally showed that the proposed features allow for more accurate spatial localization during detection and result in fast detection when coupled with cascade classifiers.2. A system for pedestrian detection based on mixtures of multiscale deformable part models and a latent support vector machine (SVM). Deformable part models are defined by a coarse root filter that approximately covers an entire object and higher resolution part filters that cover smaller parts of the object.

1.2 Objectives

In the proposed system, beacon based traffic control system is implemented for controlling the rule breaker during stop traffic signal. If anyone break the rules automatically identified and updated to the server for further action.
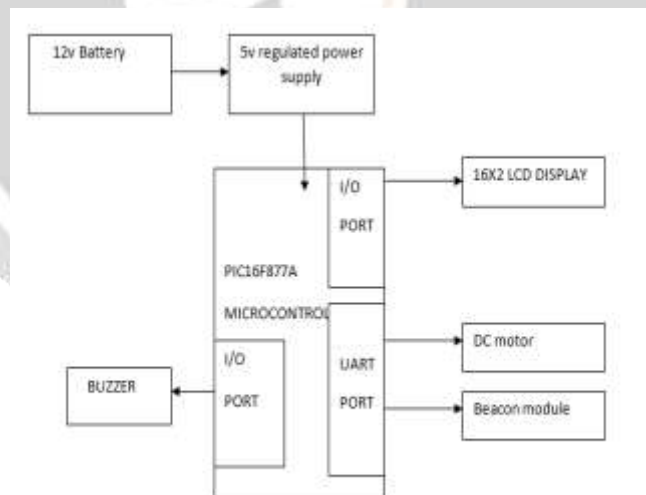
2.BLOCK DIAGRAM

2.1 Master Node
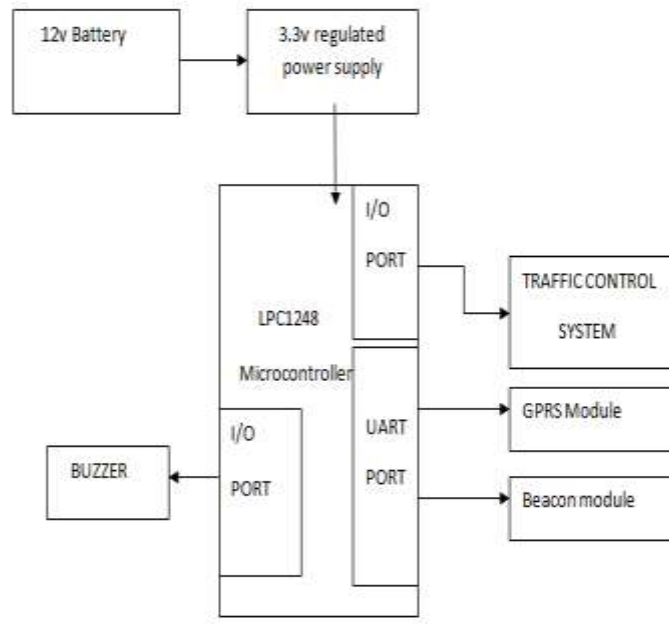
Fig-1: Master block

The figure 1 shows the block diagram of master node. The master node will be placed in the traffic signal system which will act as the receiver . The Beacon in vehicle will transmit the low energy signal which is received by master and update the details to server.

2.2 Slave Node


Fig-2: Slave block

The slave node will act as transmitter which transmit Bluetooth low energy signal. It act as a master while determining the distance between the vehicle and traffic signal system. The figure 2 shows the block diagram of slave node.

2.3 Block Diagram Description

In this project beacon based traffic management system is implemented, so two microcontroller are used one microcontroller is placed in vehicle side for sensing the nearby traffic system for controlling the speed limit of the vehicle and another microcontroller ARM controller can change into master and slave during the green and

yellow the   traffic signal beacon act as slave ,so the vehicle can identified but in red signal the beacon automatically change to master to scan the vehicle distance if anyone cross the level in RED signal automatically updated the person details in the server for tacking action on the person.

2.4 Circuit Description
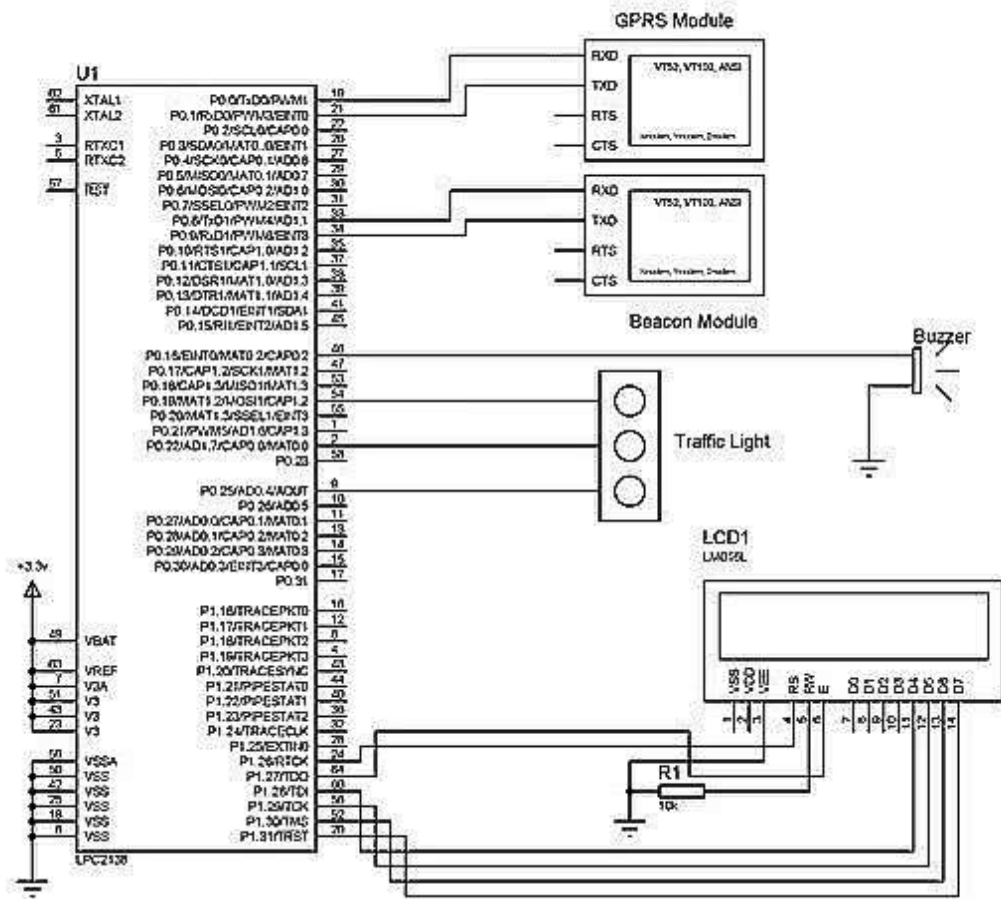
Fig-3.ARM microcontroller pin configuration with sub components

The master node is placed in the traffic signal system which is activated during the red signal. The ARM processor is used in which the GPRS module is connected to the port P0.0 and P0.1. The GPRS module is used to track the location of the place at which   the vehicle is breaking the rules. At port P0.8 and P0.9 the beacon module is connected. The beacon module is used to identify the vehicle that breaks the rules and informs through GPRS to the server.fig-3 show ARM microcontroller pin configuration with sub components. In accordance the traffic light control system is connected to port P0.16,P0.20,P0.22. The LCD display module is connected to port1 P1.26 to P1.31. The LCD is used to display the speed of the vehicle and to analyse the distance at which the traffic signal is present.
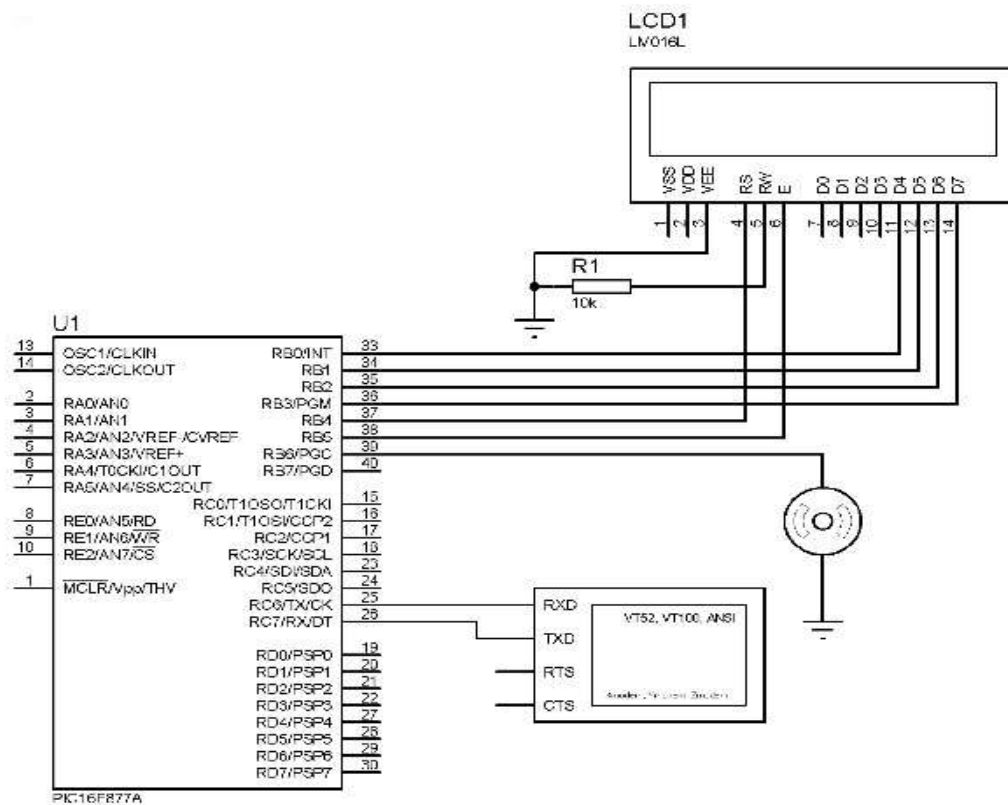
Fig-4.PIC microcontroller pin configuration with sub components.

The slave beacon module as seen in 3.3.2 will be placed in vehicle. During the yellow and green signal the processor act as slave node. In this node the processor is connected to the beacon module which act as transmitter section. The processor has beacon module which is connected to the pin RC6 and   RC7.The Fig-4 shows the PIC microcontroller pin configuration with sub components. The   beacon module will send the low BLE signal. The buzzer is connected to pin 39 which is used to intimate the server that the vehicle has crossed the rules . The LCD display is connected to note the speed of the vehicle.

2.5 Procedure for Stimulating

There are few steps through which the stimulation is done .They are as follows:

STEP 1: Project   ⟶ New micro sun project

STEP 2: Create   ⟶   New folder

STEP 3: NXP   ⟶   LPC 2148

STEP 4: Type the program in blank page.

STEP 5: Right click   ⟶   Options   ⟶ Create new hexa file.

STEP 6: New file   save as with .C extension.

STEP 7: Open proteus   Click ISIS.⟶

STEP 8: select the required components and connect them.

STEP 9: Select voltage supply as 3.3V.

STEP 10: Run the program to get output.

3.RESULTS AND DISCUSSIONS

3.1 Stimulation Output

Initially we have stimulated the output using Proteus 8 compiler. The code is written in Embedded C language and compiled.
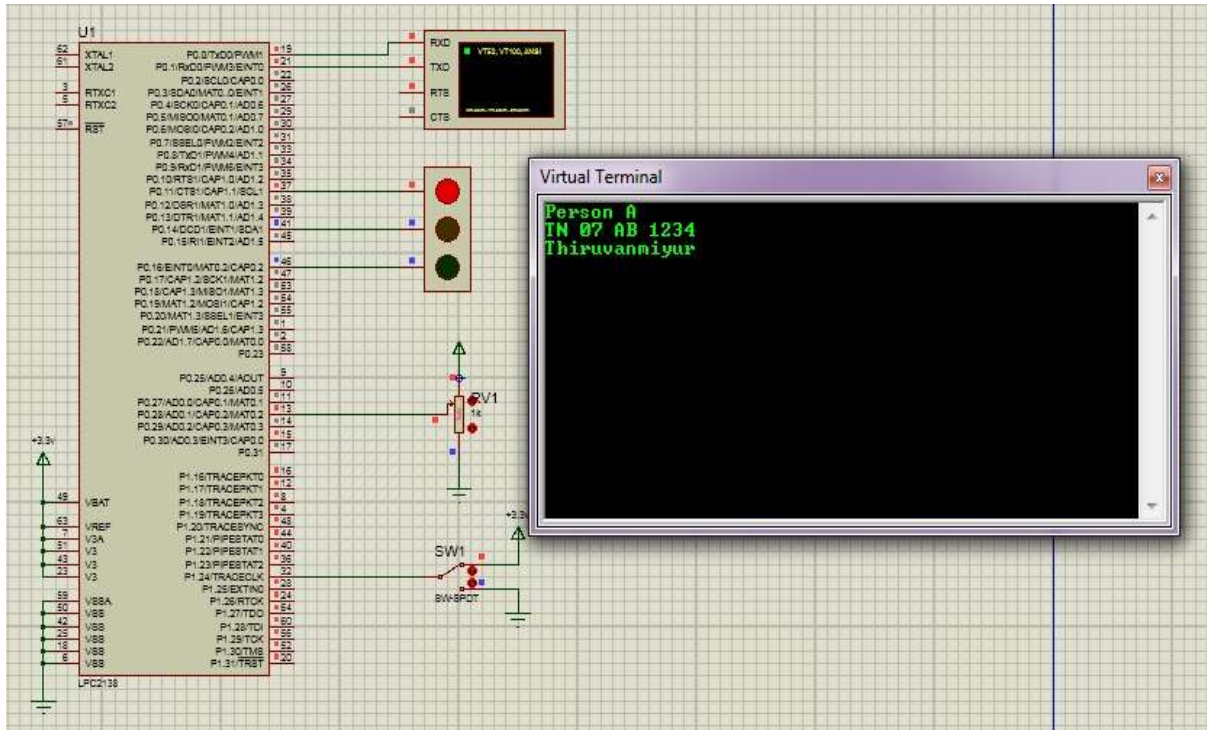

Fig-4 Stimulation output.

The compilation takes place in which by changing the capacitor pot from 0 to 1023. In which when the vehicle crosses the pot value of 500 it indicates that the vehicle had crossed the traffic signal illegally, hence it indicates the person name , number plate number and location at which the person is breaking the rule.
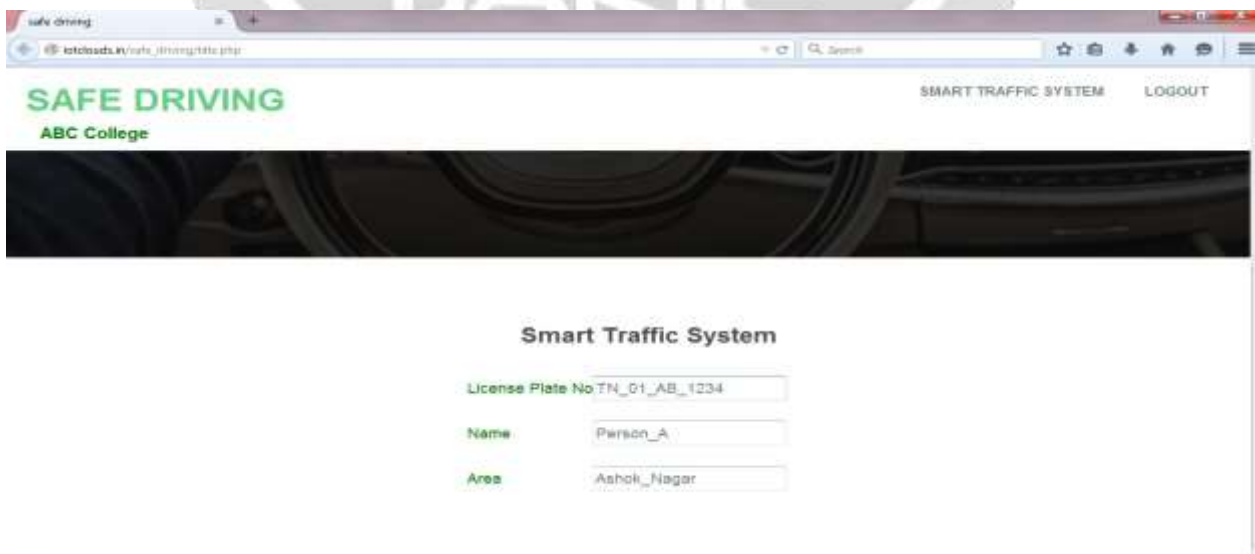
3.2 Hardware Output

Fig-5. Output of the project.

Thus by using the kit for master node and slave node the vehicle is identified which crosses the pedestrian during RED signal and updated to the server. Then the server with the help of license plate numbers it tracks the location and person's ID.

As shown in figure 5 it displays the output of the project. Once the vehicle is tracked the license plate number, person's name and location is identified through the server. Thus through this the rule breakers could be easily caught and given legal punishments.

4.CONCLUSIONS

Road traffic collisions kill about 1.2millons people around the world every year but they are largely neglected as a health and development tissue, perhaps because they are still viewed by many as human being beyond human control.Hence the use of beacon reduces the collision and accidents caused by rule breakers.

6.REFERENCES

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