International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 05 Issue: 11 | Nov 2018 www.irjet.net p-ISSN: 2395-0072

SPEED LIMIT ALERTING DEVICE

Priyanka Pal[1], Priyanka Chaurasia[2]

[1,2]*Dept. of Electronics Engineering, Vidyalankar Institute of Technology, Maharashtra, India*

Abstract - *The project is aimed at improving the safety and flow of traffic utilizing traffic capacity more effectively. There are so many traffic rules for reliable life which we break intentionally or unintentionally. Some of them can result to critical. Our project is mainly based upon the same thing. Our idea is to let it know for bikes about such zones (School/Hospital/Police) to avoid accident in school area, to keep quite in hospital area. The main objective is to design a Smart Display controller meant for bike's speed control and monitors the zones, which can run on an embedded system. Display & Control can be custom designed to fit onto a bike's dashboard, and displays information on the bike. The project is composed of two separate units: zone status unit and speed display and control unit. Once the information is received from the zones, the bike's embedded unit automatically alerts the driver, to reduce the speed according to the zone, it waits for few second, then if the bike is in the speed limit and the bike's speed is still not reduced below that speed limit, the number of the bike and the owners detailed will be sent to RTO (we have assumed a third party) through SMS.*

Key Words: **Raspberry Pi 3 Model B Raspbian Stretch, OS, PL2303HX Converter, Neo 6m v2 GPS Module.**

1. INTRODUCTION

Due to the increase in number of automobiles on the road it is not possible to monitor all area and speed zones. Most of the accidents are supposed to occur in these areas. Because the traffic police cannot go everywhere means it is difficult to control people to over speed. They do not bother about human lives so the project provides a technique to control people to follow the traffic rules in certain areas. There are many techniques available to avoid accidents like blink preventing, cruise control (cc) or Adaptive cruise control (ACC). These techniques are being used for vehicles such as cars. We are specifically doing almost the same thing for bikes. Here a GPS is used to detect and control the over speeding and other traffic rules problems.

To implement this system, we have a speedometer which calculates the speed of the bike, a GPS map which gets the speed of the speed limit zone and both are compared with the help of microcontroller. As soon as the bike enters a speed limit zone, a warning to keep the speed below the limit is given. After waiting for few seconds if the speed doesn't decrease below the limit, the details of the bike's owner goes to RTO (we have assumed a third party). Similarly for silence zone, we have a sound detection sensor which senses the horn of the bike in the silence zones and after the warning the microcontroller sends the details to RTO.

2. OVERVIEW

The system will provide a safety measure for bikers which is not effectively implemented before .With this system there will be reduction in traffic rules violation and accident rates done by bikers by huge amount .It will provide a GPS module which will do most of the task getting the location of the area, no entry, no parking will be used to avoid rule violation in those areas. An LCD screen will be used to indicate warning as well as speed limit which will be needed to be maintained or different message depending upon the area. The LCD screen will also display a message if violation of rules occurred that the bike details are sent to RTO.

3. METHODOLOGY

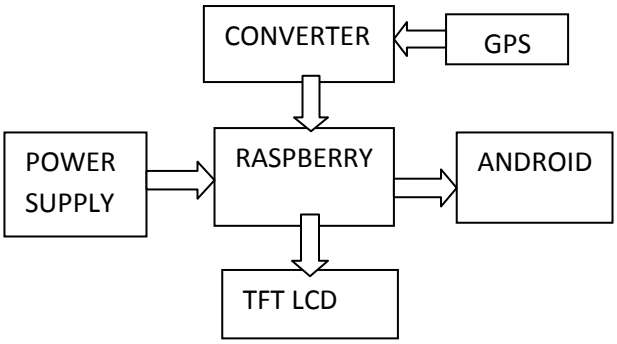

Fig 1.Block diagram

To achieve the desired aim and objective of this project, the following methods are to be adopted.

To implement the project the following module used are

1) Raspberry Pi 3 Model B
2) GPS Module
3) PL2303HX Converter
4) R-pi TFT Display

Firstly, the desired locations such as speed limit areas along with the specified speeds, the silence zones, the no entry areas, etc. according to the location (latitude, longitude) co-ordinates are already stored in the microcontroller. The Speedometer continuously calculates the speed of the bike. It uses two GPS points (locations), we can calculate the distance covered. We can use the clock inside the GPS receiver (a very accurate clock that synchronizes regularly with the atomic clocks aboard the GPS satellites) to measure how long it took the vehicle to travel between those two points. The speed from the speedometer is than compared to the speed limit of the speed limit area in which the bike is. If the speed exceeds than the speed limit a warning is display. The Microcontroller than waits for 10 seconds for the rider

to slow down below the speed limit, if he fails to slow down the speed below the speed limit then the details of the bike (Bike No. & owner details) is sent to the phone (3rd party).

4. DESIGN CONSIDERATIONS

4.1 RASPBERRY PI

The Raspberry P**i** is a credit-card-sized computer that plugs into your TV and a keyboard. In the following projects the Raspberry pi 3 model B is used. Raspberry pi is the small CPU which has ability to run many program at one time. The main purpose to use raspberry pi because we need a full-fledged computer: driving a more complicated robot, performing multiple tasks doing intense calculation.

Raspberry-pi is compatible with many operating systems. For the particular projects we are using Raspbian Stretch**.** Raspbian is the "official" operating system of the Raspberry Pi and because of that, it's the one most people will want to start with .Raspbian is a version of Linux built specifically for the Raspberry Pi.

All we need is to download the OS and copy the OS to 8GB memory card.

An SD card inserted into the slot on the board acts as the hard drive for the Raspberry Pi.

Now we can code and download various application, packages and drivers as per need for the project.

4.2 GPS MODULE

GPS module used for the project is NEO-6 module series is a family of stand-alone GPS receivers featuring the high performance u-blox 6 positioning engine. These flexible and cost effective receivers offer numerous connectivity options in a miniature 16 x 12.2 x 2.4 mm package, which provides a strong satellite search capability. With the power and signal indicators, you can monitor the status of the module.

4.3 PL2303HX

We are using USB to TTL converter to interface GPS module with Raspberry PI. The converter used is a handy USB to TTL converter based on the PL2303HX.3 LEDs are on-board to indicate power, data reception and data transmission. A 5V and 3.3V output is available--you can power your project directly from the USB port, so it functions as a USB power supply.

4.4 3.2" TFT LCD DISPLAY

Raspberry Pi compatible HDMI display; the 3.2 inches Resistive TFT Touch Screen Display, which uses SPI Protocol (serial peripheral interface) to communicate with the main processor. It can be mounted directly to the GPIO pins and it doesn't require any external power source._As a bonus, this 3.2 Inch TFT LCD Screen for Raspberry Pi v3.1 display has a resistive touch screen attached to it already, so you can detect finger presses anywhere on the screen. This display has a controller built into it with RAM buffering so that almost no work is done by the microcontroller.

5. INTERFACING R-PI WITH GPS MODULE

To start with the GPS we need to install packages. The Global Positioning System (GPS) is a network of about 30 satellites orbiting the Earth at an altitude of 20,000 km. Once it has information on how far away at least three satellites are, your GPS receiver can pinpoint your location using a process called trilateration. We can also calculate speed using GPS module. Using the latitude and longitude the speed limit, silence zone and no parking area of specified area are set. The GPS module will help to navigate the user.

6. INTERFACING R-PI WITH LCD DISPLAY

Interfacing the LCD display with your Raspberry Pi is simple. The LCD module comes with Raspberry Pi's GPIO

pin-compatible female headers. This means that you just have to plug in your display module to your Raspberry Pi's GPIO pins. No other connections or connectors are necessary! This touch screen's TFT LCD display will provide you with 320x240 resolution.

We need to install LCD driver so that LCD is compatible with raspberry-pi .The maps are display on the LCD .Using GPS module and maps displayed on LCD navigation would be easily .To display maps we are using Foxtrot GPS. Foxtrot GPS is a GTK+ based mapping and GPS application. It's typically used to show a moving map showing your position in real time. It's useful as a navigation tool, for track logging and trip planning tool. A python code is used to set predefined areas regarding speed limits, silence zones, no parking areas, etc. A logic regarding warning the bike rider about the areas is developed. It will constantly alert the rider through the python window. If traffic rules are violated even after giving the warning and the given time is exceeded. The bike's information and the details of the bike rider are sent to an authorized mobile phone through SMS via Twilio. From Twilio phone number, SMS are delivery globally. Unique software intelligence make is easy to handle different types of content in your messages and solve tough delivery challenges like sending a large volume of message .Talk to users according to their preference. Send Arrival alerts, order confirmation, appointment, reminder, and more via SMS, push, or chat or chat app. The program for this operation is also written in python which is later combined with the program of defined areas and warnings.

7. OUTPUT

The FoxTrotGPS application displays the real time map and shows the edited portion in the map. The edited portion may include the areas discussed so far. The map can be is stored in cache for offline real time navigation. The Speedometer calculated by the GPS can also be displayed in the application along with some other details.

Fig 1 : Warnings and alerts through code

We get the current location, speed, time, date from the GPS module.

8. CONCLUSION

The system will provide a safety measure for bikers which are not effectively implemented before. With this system, there will be reduction in traffic rules violation and accident rates done by bikes by a huge amount. It will provide a GPS module which will do most of the tasks of getting the locations of the areas. Areas like silence zones, speed limit areas, no entry, no parking will be used to avoid rule violation in those areas. LEDs will be used to give warning before the bike enters a particular area. An LCD screen will be used to indicate warnings as well as speed limit which will be needed to be maintained or different messages depending upon the area. A sound detection sensor will be used to check whether the horn is blown in silence zones or not. The LCD screen will also display a message if violation of rules occurred that the bike's details are sent to RTO.

Deliverables -

- Speed Limit alerts
- Silence zone alerts
- No entry areas alerts
- No parking alerts
- Display through LCD screen

REFERENCES

[1] Lita, I., Cioc, I.B. and Visan, D.A., 2006, May. A new approach of automobile localization system using GPS and GSM/GPRS transmission. In Electronics Technology, 2006.ISSE'06. 29th International Spring Seminar on (pp. 115-119).IEEE

[2] Vaughn. D., Trimble Navigation Limited, 1996.Vehicle speed control based on GPS/MAP matching of posted speeds. U.S. Patent 5,485,161.

[3] Ayanoglu, E. and Sabnani, K.K., Lucent Technologies Inc., 1997.Navigation system foe an automotive vehicle. U.S. Patent 5,689,252.