Divider,Speed breaker Detection and Accident Prevention with Audio Aided Alert Using Raspberry Pi Processor

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Abstract: - Obstacle Detection System(ODS) employs fixed transmitters on the dividers and speed breakers that continuously give out signals indicating it's presence. The vehicle fitted with a receiver will identify these signals and decode the image of the obstacle. The corresponding voice alert is given to the driver. Typically, these systems recognize speed breakers and dividers their primary function is to inform the driver of the upcoming dividers that are interpreted and displayed on a panel fitted on the vehicle dashboard. This project runs on Raspberry Pi platform. Signals through RF can travel through larger distances making it suitable for long range applications. RF signals can travel even when there is an obstruction between transmitter & receiver. Next, RF transmission is more strong and reliable. RF communication uses a specific frequency several carrier frequencies are commonly used in commercially-available RF modules, including those in the industrial, scientific and medical (ISM) radio bands such as 433.92 MHz, 315 MHz, 868 MHz, 915 MHz, and 2400 MHz These frequencies are used because of national and international regulations governing the use of radio for communication. The first generation Raspberry Pi chip operated at 700 MHz by default and did not become hot enough to need a heat sink or special cooling, unless the chip was overclocked. The second generation runs on 900 MHz by default, and also does not become hot enough to need a heat sink or special cooling, usels.

Keywords: - Divider, Raspberry Pi, RF module, Speed breaker and Vehicle

I.

INTRODUCTION

Nowadays every news media communication is filled with horrible reports on road accidents. Looking closely at the reasons behind, invisible dividers and the steep build of speed breakers have always posed a major problem to the commuters on road. For the drivers travelling in the night time, their journey always has a high risk factor when the dividers and pedestrian crossings are not visible even with highlighters or road signs with glow-in-the-dark sheets. When all these alerts fail miserably to alert the drivers, there is a strong need to device a better method and a more efficient one. The project at hand aims at giving a constant as well as an accurate positional presence of the road barriers with the help of a radio frequency identity transmitter embedded to the chosen barrier to be detected. This will keep sending out signals at equal intervals of time for a pre-determined circumference of distance. The vehicle passing this stretch of road will be fixed with a radio frequency identity receiver. This will detect these signals from the barrier and map the exact location. After this is done, an audio alert is given on the monitor with speaker module on the dashboard of the car, lorry/front hood of the bike. This alert will tell what kind of barrier is present and at what distance is it located. Thus the driver will be attentive and navigate with intelligence.

II. LITERATURE SURVEY

Jeffrey Miller, Wolfram Donat, John Harris, "Signal timing for fleeting multiple intersecting roadways" [1] proposed increasing transportation effeciency by optimizing traffic flow is by fleeting traffic signals". A roadway is fleeted when its signal sequence allows a platform of vehicles to travel its length without being stopped by a red light which in turn reduces congestion. Our research examines the conditions necessary to timing traffic signals in intersecting directions so that both directions can have platooned vehicles simultaneously the time to travel along the roadways between traffic signals that are stones for platooning in multiple directions must be equivalent. The system to improve traffic is done by expanding roadway infrastructure. The infrastructures of the roads in the highways are modified in order to have better road

transport." Design of intelligent traffic light controller using embedded system", [4] Proposed a methodology to make traffic more efficient we explicit the emergence of new technique called intelligent traffic light controller. It makes use of sensor networks along with the embedded technology. The timings of red, green, lights at each of crossing of road will be intelligently detected on the total traffic on all adjacent roads. GSM cell phone interface is provided for the users those who wish to obtain the latest position of traffic light on congested roads." Optimization of traffic signal light timing using simulation", [7] Traffic congestion is one of the worst problems in many countries. Computer simulation is a powerful tool for analyzing complex and dynamic scenarios. It's an appealing approach to analyze repetition process. Simulation analyses enormous amounts of data. Hence computer simulation can be used effectively to analyze traffic flow patterns and signal effect timings. This uses a special purpose simulation tool for optimal traffic signal timing. Traffic congestion is lessened by the use of a special purpose simulation. It optimizes signal light timing at a single junction as well as an actual road network with multiple junctions. It provides signal light timing for certain period according to traffic demand. "North-American Speed Limit Sign Detection and Recognition for Smart Cars" [3] proposed SLS detection and recognition system focusing on North-American speed limit signs, including Canadian and U.S.signs. A modified version of Histogram of Oriented Gradients (HOG) is used to detect and recognize SLS through a set of two-level SVM-based classifiers. Moreover, They build our online database called North-American Speed Limit Signs (NASLS) which includes four SLS categories; white, yellow, black and orange signs. They show through an extensive set of experiments that our system achieves an accuracy of more than 94% of SLS recognition.

III. PROPOSED SYSTEM

The proposed system is to detect the various dividers and speed breakers present on the roads. Nowadays so many accidents occur wherein drivers are not aware of the upcoming dividers that are present on their way. They are unaware of the dividers that are out of the vision field. Hence the Obstacle Detection System will sense the presence of these from a distance of 500 meters and send appropriate audio alert to the driver. The term RF module can be applied to many different types, shapes and sizes of small electronic sub assembly circuit board. It can also be applied to modules across a huge variation of functionality and capability. RF Modules typically incorporate a Printed circuit board, transmit or receive circuit, Antenna, and Serial interface for communication to the host processor. An RF transmitter module is a small PCB sub-assembly capable of transmitting a radio wave and modulating that wave to carry data. Transmitter modules are usually implemented alongside a micro controller which will provide data to the module which can be transmitted. RF Transmitters are usually subject to Regulatory Requirements which dictate the maximum allowable Transmitter power output, Harmonics, and band edge requirements. An RF Receiver module receives the modulated RF signal, and demodulates it. There are two types of RF receiver modules: super heterodyne receivers and super-regenerative receivers. Superregenerative modules are usually low cost and low power designs using a series of amplifiers to extract modulated data from a carrier wave. Super-regenerative modules are generally imprecise as their frequency of operation varies considerably with temperature and power supply voltage. Super heterodyne receivers have a performance advantage over super-regenerative; they offer increased accuracy and stability over a large voltage and temperature range. This stability comes from a fixed crystal design which in turn leads to a comparatively more expensive product.







Raspberry Pi



The Raspberry Pi is a series of credit card-sized computers. The SoC used in the first generation Raspberry Pi is somewhat equivalent to the chip used in older smartphones (such as iPhone / 3G / 3GS). The Raspberry Pi is based on the Broadcom BCM2835 system on a chip (SoC),[1] which includes an 700 MHz ARM1176JZF-S processor, Video core IV GPU,[8] and RAM. It has a Level 2 cache of 128 KB, used primarily by the GPU, not the CPU. The SoC is stacked underneath the RAM chip, so only its edge is visible.

RF Transmitter Receiver



This RF module comprises of an RF Transmitter and an RF Receiver. The transmitter/receiver (Tx/Rx) pair operates at a frequency of 434 MHz. An RF transmitter receives serial data and transmits it wirelessly through RF through its antenna connected at pin4. The transmission occurs at the rate of 1Kbps - 10Kbps.The transmitted data is received by an RF receiver operating at the same frequency as that of the transmitter.



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A chip that will be compatible with voice-enabled interface, and will be powerful enough to be able to process voice with minimum usage of battery.



Speed Breaker



IV. CONCLUSION

In the existing system, the major drawback was that it detected only the traffic signs on the roads but left out the vital need of the hour. As a result the road accident rates are increasing by the hour. This project has been carried out to overcome this difficulty by detecting as well as alerting the driver with a voice command. Thereby, the driver will be vigilant of the upcoming barrier and will navigate with intelligence. This will greatly reduce the hazards and hence save the lives of countless people who commute daily.

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