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IoT Based System of Driver-Mode Application for Road Safety

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ABSTRACT

The Safe System (SS) approach to road safety emphasizes safety-by-design through ensuring safe vehicles, road networks, and road users. With a strong motivation from the World Health Organization (WHO), this approach is increasingly adopted worldwide. Our interest in this work is to complement the approach with a short-to-medium term dynamic assessment of road safety. Toward this end, we introduce a novel, cost-effective Internet of Things (IoT) architecture that facilitates the realization of a robust and dynamic computational core in assessing the safety of a road network and its elements. In doing so, we present a IoT based system "Enablement Of Driver-Mode Application For Road Safety". Here we produce a mobile application accompanying a NodeMcu based circuit. This project is developed to minimize the risk of accidents while attending the mobile phone during driving. This application change the user's Mobile phone into DND mode if the user is riding or driving the vehicle at a speed more than 14 Km/Hour. Before start of the journey, user needs to connect with circuit installed in the vehicle. The installed circuit consist of NodeMCU and a speed sensor which will sense the speed. This is an innovative project of the "Ministry of Road Transport and Highways". This application will provide the way to prevent the accident while driving.

Keywords : Internet of Things, Smartphone, Road Safety, Arduino, G-Sensor, Accelerometer

I. INTRODUCTION

Road car accidents are one of the world's biggest general wellbeing and damage aversion problem. According to the World Health Organization (WHO), a larger number of individuals bite the dust on road in India than anyplace else on the planet. No less than 13 individuals pass on consistently in road accidents in our nation; the most recent report of the national wrongdoing record Dureau uncovers.

In 2007, 1.14 lakh individuals in India lost their lives in road incidents ill-advised road framework inability to pursue as far as possible, and increment in drinking and driving propensities are among the main considerations adding to passing's from road crashes, WHO said in its investigate 'Decade of Action for Road Safety 2011-2010'.Currently road security frameworks are accessible in top of the line extravagance vehicles, for example, Audi, Mercedes, Benz, and so on., to give some examples. Model: On star Corporation gives membership based interchanges, in– vehicle security, hand free calling, turn-by-turn route, and remote diagnostics frameworks all through the US, Canada and China turn-by-turn route and road side help .The inspiration driving the work upheaval is an endeavor to make an inserted

framework to get a positive distinction the field of road wellbeing and road discipline.

The work handles some significant reasons for road accidents, for example, breaking traffic flag and horning in No horning zone. It additionally has a noteworthy target of practicing road order, for example, speed control in various regions and horn control in horn denied zones .This paper presents vehicle speed control in factor zone in this component ;speed of the vehicle is controlled in various regions, for example, flyovers, spans, expressways, schools, emergency clinics, urban communities and rural areas .Horn control of vehicle. Horn control of vehicles in no sounding zone– controlling undesirable aggravations in horn denied zone, for example, medical clinics, open libraries, courts, schools, and so on.,

The Safe System (SS) way to deal with transport systems began with the "Protected Road Transport System" demonstrate created by the Swedish Transport Agency. In its pith, the methodology relocates from the view that accidents are to a great extent and consequently the driver's blame to a view that recognizes and assesses the genuine foundations for accidents. Through the arrangement of wellbeing into the security of three components (vehicle, road, and road client), SS limits fatalities and wounds by controlling paces and encouraging brief crisis reaction. The model has been broadly received since its presentation and is right now spurred by the WHO as a reason for road wellbeing arranging, strategy making, and requirement.

A focal accentuation is given to speed in the SS approach as it is the most grounded and most essential variable in the result of the casualty. The delicacy of the human body makes it improbable to endure a padded effect at a speed of more than 30 km/h, with lower speeds bringing about either passing or genuine damage [1, 2]. The goal of the SS approach is that the three model components ought to be planned and observed to proactively keep dangerous velocities from occurring and take into consideration a diminished crisis reaction time in case of an accident. Components of the SS approach are as per the following.

(1) Safe Vehicle. Accentuation on vehicle security is confirmed through ordered administrative testing and rating, just as advancements, for example, electronic dependability control. Past this, authorized checks (e.g., upon permit restorations) joined with on the road detailing work to audit the status of vehicle security.

(2) Safe Road. The evaluation of road (or road organize) wellbeing is multifaceted. Road examination empowers clear and direct perception of the condition of the road and surveys the requirement for fixes or adjustments. The structure of the road organize is agreeable to wellbeing appraisal through parceling into what is designated "Traffic Analysis Zones (TAZs)" [4]. Moreover, contemplations for accident information and other supporting information offer further bits of knowledge into general security appraisal.

In 2011, the European Road Assessment Program (EuroRAP) produced the European Road Safety Atlas for EU nations [5]. The map book demonstrated the wellbeing dimension of roads with a star rating dependent on exceptionally prepared vehicles for sight and sound based information accumulation [6]. The EuroRAP endeavors keep on actualizing a SS approach over the EU, alongside a few other national projects inside the International RAP, or iRAP, an activity [7].

(3) Safe Road User. There are a few viewpoints to road client wellbeing, including measures for instruction and mindfulness, travel remove, presentation, licensure, requirement, and calm driving [3]. The requirement for such portrayal rises generously as the discoveries of accident report investigation in urban communities commonly note a basic reliance on either driver conduct or driver mindfulness [8]. An extraordinary need is additionally settled in these investigations for creative components to impart safe driving at the permitting and post-authorizing stages.

Enablement of driver mode application for the road safety is an application which is mainly focusing on the safety of driver and others while travelling on a road. While travelling on the road its necessary that the driver of the vehicle must follow the traffic rules. Most of the drivers of the vehicle are usually communicate through mobile phones while driving , due to that there is always danger of accident because of lack of concentration. This is the project of ministry of road transport and highways. In this project we are disallowing the driver to use the mobile phone while driving. Because in India if see the statistics most of the road accidents happens due to use of the mobile phones while travelling. In India 413 people dies every day because of the conducting phone calls and texting while driving. Also the violation of traffic rules are majorly happens. Our application named "Enablement of driver mode application of road safety" will be totally based on the principle of not allowing any driver mobile phones for conducting calls and texting while driving. In this way this application will work this application is very useful for safety of roads as more number of road accidents happens because of the use of mobile phones while driving. In this application user needs to connect using the mobile hotspot with circuit installed in the vehicle. This application change the user's Mobile phone into DND mode if the user is riding or driving the vehicle at a speed more than 14 Km/Hour. Before start of the journey, user needs to connect with circuit installed in the vehicle.

II. LITERATURE REVIEW

Pramodshelke et al. [9] had proposed that a review on Arduino Based embedded System in Car for Road Safety using RFID .In this work when the RFID tag is detected by the RFID reader the speed of the motor reduces in specified areas and it avoids accidents.

Ch . Sonali Shankar et al., [10] had proposed that a review on Arduino based Embedded System in Passenger Car for Road Safety .In this work the sound of the horn stops and speed is also reduced when the RFID tag is detected by the RFID reader.

Deepa et al., [11] had proposed that a review on Embedded System in Passenger Car for Road Safety.in this work the proposed features are automatic collision notification that gives notification to the victim's relative, red light traffic control makes sure the vehicle doesn't break signal, speed control alters speed in different zones, horn control prevents honking in horn prohibited zone, alcohol detection detects drunk driving and vehicle security is used to prevent theft Suhas Katkar et al., [12] had proposed that a review on An Embedded System In passenger Car For Road Safety. This project is designed to inform about an accident or theft that has occurred to the vehicle, to the family members of the travelling persons and concerned authorities. Anto bennet et al., had proposed that a review on An Embedded System in Passenger Car for Road Safety using GPS and GSM. This work is designed to inform about an accident that is occurred to a vehicle to the family members of the travelling persons.

Anto bennet et al., [13] had proposed that a review on an Embedded System in Passenger Car for Road Safety using GPS and GSM.GPS Receiver gets the location information from satellite in the form of latitude and longitude. The system can be interconnected with the alcohol detection and alert the owner on his mobile phone.

Anto bennet et al., [14] had proposed that a review on Alcohol Detection and Accident Avoidance Using locking With Tracking. This system will detect drunker driver by alcohol sensor through driver breathe fitted on steering in front of driver ,the message is sent to the police through GSM system and provides GPS base system to track those cars.

III. PROPOSED SYSTEM

In this application of "enablement of driver mode application for road safety application" we are working on the safety of driver while driving the vehicle it is very important to follow the rules and regulation of the traffic. In this application change the user's Mobile phone into DND mode if the user is riding or driving the vehicle at a speed more than 14 Km/Hour. Before start of the journey, user needs to connect with circuit installed in the vehicle. Figure 1. Shows the Block diagram of the proposed system.

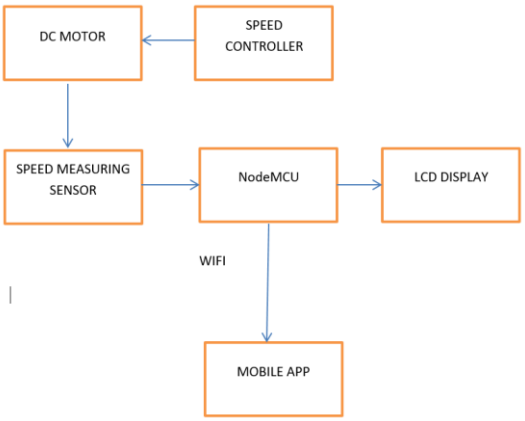

Figure 1. Block Diagram

The system consist of three important components:

- Speed Measuring Sensor
- NodeMCU
- Android Application

Here the entire circuit will be installed into the vehicle. The speed sensing device will measure the speed. The speed will be calculated by converting the RPM of the wheels in to distance covered by the vehicle. As soon as the speed reaches the threshold of 14 KM/HR, a signal will passed to the NodeMCU which is a Wi-Fi enabled microcontroller. NodeMCU will pass the signal to an android application installed in users mobile. The Android app will change the ringing mode of the mobile to DND. When the speed goes down below 14 Km/Hr, the users mobile will again come back to normal mode.

Signal Generation by speed sensor can be accomplished using any one of four techniques:

- Optical method
- Sliding contact (electrical conducting) method
- Magnetic saturation (reluctance) method
- Proximity sensor method

The method of signal interpretation and processing is the same for all four types of signal generation.

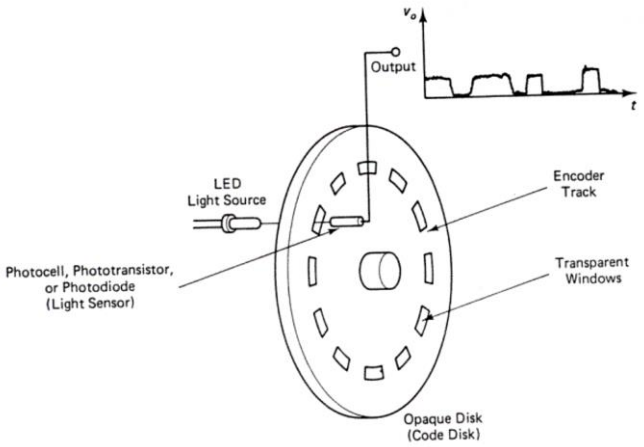

Figure 2. Schematic Representation of an Optical Encoder One Track and One Pick-Off Sensor Shown

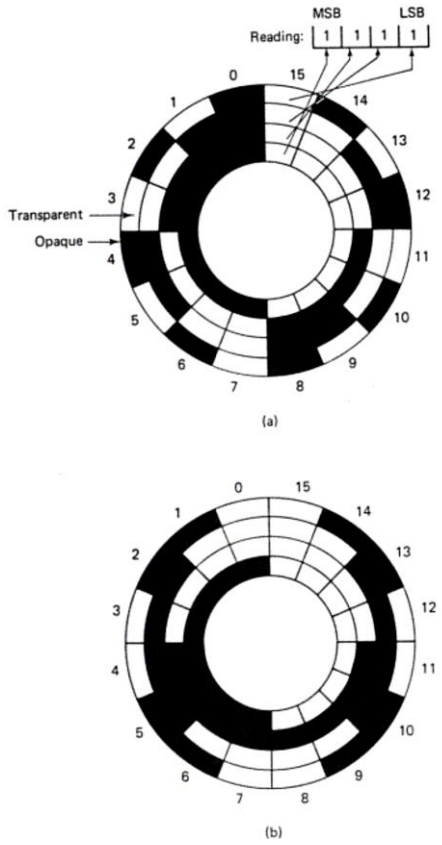

Figure 2. Schematic Diagram of an Absolute Encoder Disk Pattern (a) Binary code (b) Gray code.

In Binary Code, bit switching may not take place simultaneously. Absolute Encoders must be powered and monitored only when a reading is taken. Also, if a reading is missed, it will not affect the next reading. Ambiguities in bit switching can be avoided by using gray code. However, additional logic is needed to covert the gray-coded number to a corresponding binary number.

IV. CONCLUSIONS

In this system we tried to tackle the issue of accidents happening because of mobile phones. Users have tendency to receive the call while driving or riding. Here we develop a IoT based system which changes the user's mobile phone mode to DND if the user is driving the vehicle at the speed of 14KM/Hr or above. Here we have developed an android application in support of the Hardware circuit. This app receives the signal from the circuit installed in the vehicle. The circuit consist of speed sensor and NodeMCU which generates the signal if the vehicle cross the threshold of 14 KM/Hr.

V. REFERENCES

[1]. F. Wegman, “The future of road safety: A worldwide perspective,” IATSS Research, vol. 40, no. 2, pp. 66–71, 2017. View at Publisher · View at Google Scholar ·

[2]. World Health Organization, “Save LIVES - A road safety technical package,” 2017.

[3]. W. E. Marshall, “Understanding international road safety disparities: Why is Australia so much safer than the United States?” Accident Analysis & Prevention, vol. 111, pp. 251–265, 2018. View at Publisher ·

[4]. X. Wang, X. Wu, M. Abdel-Aty, and P. J. Tremont, “Investigation of road network features and safety performance,” Accident Analysis & Prevention, vol. 56, pp. 22–31, 2013. View at Publisher · View at Google Scholar ·

[5]. European Road Assessment Program (EuroRAP), “European Road Safety Atlas,” http://atlas.eurorap.org/.

[6]. European Road Assessment Programme (EuroRAP), “Star Ratings,” http://www.eurorap.org/protocols/star-ratings/.

[7]. International Road Assessment Programme (iRAP), “iRAP,” https://www.irap.org/.

[8]. H. M. Hassan and H. Al-Faleh, “Exploring the risk factors associated with the size and severity of roadway crashes in Riyadh,” Journal of Safety

Research, vol. 47, pp. 67–74, 2013. View at Publisher·

[9]. Prof. Pramodshelke, Ram Anjankar, Sakeshee Wanare, Ganesh Surve "A Review on Accident Avoidance by Eye Blink Sensor and Alcohol Sensor Using GSM" E-ISSN:2321-9637, 09th April 2017

[10]. Sonali Shankar Chalwad, Snehal Bhimrao Gaikwad, Prashant A. Chougule "Accident Prevention Using Eye Blink Sensor"ISSN:2393-2835, Volume-4,Issue-1, January-2017

[11]. SuhasKatkar,MaheshManikKumbhar, Priti Navanath Kadam "Accident Prevention System Using Eye Blink Sensor" Volume:03, Issue:05, May-2016

[12]. Pratik S. Danage, Ajay B.Dongare, SangramsinhS.Dongare, Rahul B.Ghogare, Ganesh N.Khare "Automatic Breaking Sysetm Using Eye Blinking Sensor"Vol.2, Issue 2, pp(166- 170),October2015- March-2016

[13]. Deepa K. B, Chaitra M, Ankit Kumar ShrmaSreedar V. S, Prashant Kumar H. R." Accident prevention by eye binking sensor and alcohol detector" Volume-4 , Issue-7 , pp: 351-354, July-2015

[14]. Dr.AntoBennet, M , Sankaranarayanan S, Ashokram S ,Dinesh Kumar T R,"Testing of Error Containment Capability in can Network", International Journal of Applied Engineering Research, Volume 9, Number 19 (2014) pp. 6045-6054

[15]. Dr.AntoBennet, M, SankarBabu G, Natarajan S, "Reverse Room Techniques for Irreversible Data Hiding", Journal of Chemical and Pharmaceutical Sciences 08(03): 469-475, September 2015.

[16]. Dr.AntoBennet, M ,Sankaranarayanan S, SankarBabu G, " Performance & Analysis of Effective Iris Recognition System Using Independent Component Analysis", Journal of Chemical and Pharmaceutical Sciences 08(03): 571-576, August 2015.r.

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