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INTELLIGENT FATIGUE DETECTION AND AUTOMATIC VEHICLE CONTROL SYSTEM

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Abstract: Drowsy driving is one of the most road accidents. Totally different techniques are reportable in the literature to discover drivers' sleepiness. However, the majority of the prevailing systems solely alert the motive force if sleepiness is detected. Consequently, the drowsy driver continues driving, with a high risk of a devastating accident. During this paper, we have a tendency to project associate degreed verified an EEG primarily based system that not solely alerts the motive force by alarm, but conjointly puts the vehicle in semiautomatic parking mode by dominant fuel provide if sleepiness is detected. At an equivalent time, it reports closed police offices by SMS that contains necessary info to require essential steps locating the vehicle. hold on EEG signals, obtained with wireless wearable headsets in different subjects {in totally different |in several |in numerous} conditions by different analysis teams, were utilized in this work. Power spectrum analyses were dispensed in MATLAB to see the dominant frequency elements within the brain signals. The slow wave to quick wave ratios of EEG activities was assessed for a variety of epochs to see the driver's sleepiness. GPS and GSM modules were used with Arduino MEGA for the following, remote notification and servomotor management. The performance of the projected system was evaluated by holding on to information that confirmed its feasibility and responsibility.

Keywords: Smart system, driver fatigue detection, remote notifications, drowsiness detection, Arduino MEGA, GPS module.

I. INTRODUCTION

INDIA is the second most colonized country at intervals on the globe and will be a fast-growing economy. It's seeing terrible road congestion problems in its cities. Infrastructure growth is slow as compared to the growth in a variety of vehicles, due to space and value constraints. Also, Indian traffic is non-lane based and chaotic.

It needs control solutions that are different from countries. Intelligent management of traffic flows other than reduces the negative impact of congestion. In recent years, wireless network units have been widely used in road transport as they provide value-effective selection. Technologies like Wireless Remote and Briand GSM could also be used au fait to provide value-effective solutions. RFID is a wireless technology that uses radio frequency magnetism energy to carry information between the RFID tag and the RFID reader.

Some RFID systems will exclusively work within varying inches or centimetres, while others might match for 100 meters (300 feet)or more. A GSM equipment may well be a specialized type of equipment that accepts a SIM card and operates over a subscription to a mobile operator, rather sort of an itinerant. Recommends unit accustomed to management modems. These commands return from Hayes commands that were used by the Hayes smart modems.

The Wireless Remote operates at low power and will be used in the smallest number of levels of labour configurations to perform predefined tasks. It operates in belief bands(868 rates in Europe, 915 rates in the USA and Australia, 2.4 rates in the remainder of the world). Data transmission rates vary from twenty-886 to two 50 Kilobits/second at intervals.4 GHz frequency band.

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II. LITERATURE SURVEY

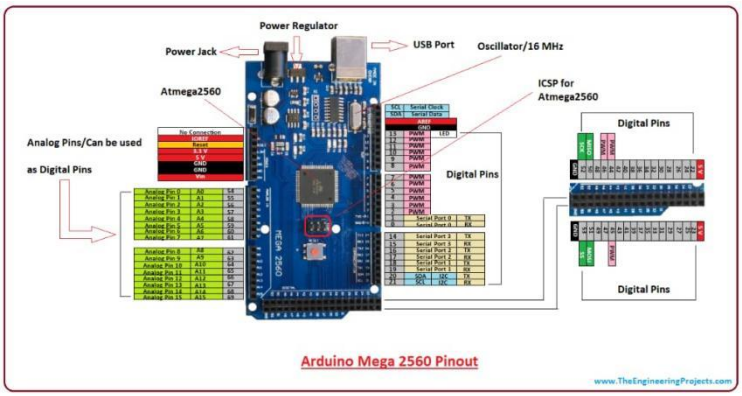
Traffic congestion may be a major drawback in cities of developing Countries like the Asian nation. Growth in the urban population and also the middle-class phase contribute considerably to the rising range of vehicles within the cities. Congestion on roads eventually leads to slow-moving traffic, which will increase the time of travel, so it stands out in concert of the major problems in metropolitan cities. In, a green wave system was mentioned, which was used to offer clearance to any emergency vehicle by turning all the red lights to inexperienced on the trail of the emergency vehicle, therefore providing an entire inexperienced wave to the specified vehicle.

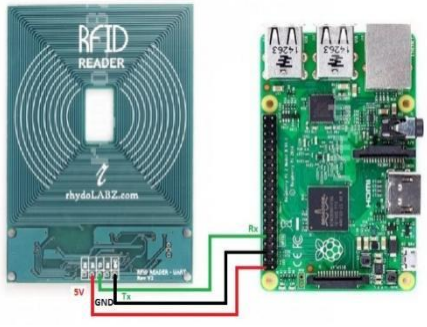
A ‘green wavers the synchronization of the inexperienced section of traffic signals. With a ‘green wave’ setup, a vehicle passing through an inexperienced signal can continue to receive inexperienced signals because it travels down the road. Additionally, to the inexperienced wave path, the system can track a purloined vehicle when it passes through a traffic signal. an advantage of the system is that GPS within the vehicle doesn't need extra power. the largest disadvantage of experienced waves is that, once the wave is disturbed, the disturbance will cause traffic issues that can be exacerbated by the synchronization.

This RFID technique deals with multi-vehicle, multilane, and multi-road junction areas. It provides an Associate in Nursing economic time management scheme, in which a dynamic time schedule is discovered in real-time for the passage of each traffic column. The data processing of the system emulates the judgment of a traffic lawman on duty, the number of conveniences in every column, and therefore the routing priorities, upon which the calculations and the judgments are made. The disadvantage of this work is that it doesn't discuss what methods are used for communication between the emergency vehicle and, therefore, the traffic signal controller.

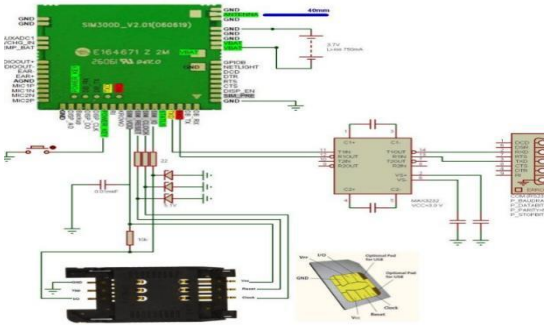
In it planned RFID and GPS based mostly on an automatic clearance system for automobiles. The focus of this work is to scale back the delay in the arrival of the automobile to the hospital by automatically clearing the lane in which the ambulance is traveling before it reaches the traffic signal. This will be achieved by turning on the light lights within the path of the ambulance, inexperienced once the automobile is at a precise distance from the traffic junction.

III. PROPOSED MODEL





RFID READER



GPS MODULE SIM 300

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From the present drawback section, it can be seen that existing technologies are insufficient to handle the issues of congestion management, emergency vehicle clearance, taken vehicle detection, etc. To solve these issues, we have a tendency to propose implementing our intelligent control system. It principally consists of 3 elements. The first half has an automatic signal management system. Here, every vehicle is supplied with an RFID tag. Once it comes within the variety of RFID reader, it'll send the signal to the RFID reader. The RFID reader can track how many vehicles have suffered for a specific amount and determine the congestion volume.

Consequently, it sets the green light-weight period for that route. The second part is for the emergency vehicle clearance. Here, every emergency vehicle has a Wireless Remote transmitter module and the Wireless Remote receiver is implemented at the traffic junction.

The buzzer is switched on once the vehicle is employed for emergency purposes. This will send the signal through the Wireless Remote transmitter to the Wireless Remote receiver. It'll create the light to change to inexperienced. Once the car passes through, the receiver now doesn't receive the Wireless Remote signal and also the lights are turned to red.

The third half is responsible for solving vehicle detection. Here, when the RFID reader reads the RFID tag, it compares it to the list of so that. If a match is found, it sends an SMS to the police management room and changes the light to red, so that the vehicle is created to prevent traffic junctions and native police will take appropriate action. The list of elements used in the experiment are the WIRELESS module, Microchip MEGA 2560, RFID Reader–125KHz–TTL, and SIM300 GSM module.

IV. CONCLUSION

With automatic stoplight management based on the traffic density within the route, the effort on the part of the traffic policeman is saved. Because the entire system is automated, it needs terribly less human intervention. With taken vehicle detection, the signal mechanically turns to red, so the lawman will take applicable action, if he/she is at the junction. Also, SMS are going to be sent so they will prepare to catch the taken vehicle at the next doable junction. Emergency vehicles, like cars and health trucks, ought to reach their destinations at the earliest.

If they spend plenty of their time in traffic jams, the precious lives of many individuals are also at risk. With emergency vehicle clearance, the traffic signal turns to inexperienced as long as the emergency vehicle is waiting within the traffic junction. The signal turns to red only after the emergency vehicle passes through. Further enhancements are done to the prototype by testing it with longer-varied RFID readers.

Consequently, GPS is placed into the vehicle detection module, so that the exact location of the taken vehicle is known. Currently, we've got an enforced system by considering one road at the traffic junction. It is improved by extending all the roads during a multi-road junction. An ultrasonic sensing element is employed to induce the correct result.

REFERENCES

[1] IEEE PAPER on Driver Fatigue Detection System By: E. Rogado, J.L. Gcía, R. Barea, L.M. Bergasa, IEEE TRANSACTION ON EMBEDDED SYSTEM VOL 54, NO.2, MAY 2012
[2] INTERNATIONAL JOURNAL (IJEAT) paper on Vision-based Real-time Driver Fatigue Detection System for Efficient Vehicle Control by D. Jayanthi, M. Bommy ISSN: 2249 – 8958, Volume-2, Issue-1, October 2012.
[3] A. Eskandarian and A. Mortazavi, "Evaluation of a smart algorithm for commercial vehicle driver drowsiness detection," Intelligent Vehicles Symposium, 2007 IEEE, pp. 553–559, June 2007.
[4] Qiang Ji, Zhiwei Zhu, y Peilin Lan: Real-Time Nonintrusive Monitoring and Prediction of Driver Fatigue. IEEE Transactions on Vehicular Technology, vol. 53, nº. 4, July 2004.
[5] R.C. Coetzer and G.P. Hancke, "Eye Detection for a Real-Time Vehicle Driver Fatigue Monitoring System," Proc. 2011 IEEE Intelligent Vehicles Symposium, Baden-Baden, Germany, 2011, pp. 66-71
[6] Wen-Bing Horng, Chih-Yuan Chen, Yi Chang, Chuu-Hai Fan, (2004), ―Driver Fatigue Detection Based on Eye Tracking and Dynamic Template Matching,‖ IEEE Proceedings of International Conference on ―Networking, Sensing & Control‖, Taipei, Taiwan.
[7] Mai Suzuki, Nozomi Yamamoto, Osami Yamamoto, Tomoaki Nakano, y Shin Yamamoto: Measurement of Driver's Consciousness by Image Processing-A Method for Presuming Driver's Drowsiness by Eye-Blinks coping with Individual Differences - 2006 IEEE International Conference on Systems, Man, and Cybernetics
[8] Book: EMBEDDED SYSTEM DESIGN OF JPEG IMAGE DECOMPRESSION by: Parikshit Nigam B.E., Patel University, India, 2006

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ISO 3297:2007 Certified ⁜ Impact Factor 7.918 ⁜ Vol. 11, Issue 12, December 2022

DOI: 10.17148/IJARCCE.2022.111227

[9] G. Varaprasad and R. S. D. Wahidabanu, "Flexible routing algorithm for vehicular area networks," in Proc. IEEE Conf. Intell. Transp. Syst. Telecommun., Osaka, Japan, 2010, pp. 30–38.

[10] B. P. Gokulan and D. Srinivasan, "Distributed geometric fuzzy multiagent urban traffic signal control," IEEE Trans. Intell. Transp. Syst.,vol. 11, no. 3, pp. 714–727, Sep. 2010.

[11] K. Sridharamurthy, A. P. Govinda, J. D. Gopal, and G. Varaprasad, "Violation detection method for vehicular ad hoc networking,"Security Commun. Netw., to be published.

[12] R. Hegde, R. R. Sali, and M. S. Indira, "RFID and GPS based automatic lane clearance system for ambulance," Int. J. Adv. Elect. Electron.Eng.,vol. 2, no. 3, pp. 102–107, 2013.

[13] M. Abdoos, N. Mozayani,and A. L. C. Bazzan, "Traffic light control in non-stationary environments based on multi agent Q-learning," in Proc.14th Int. IEEE Conf. Intell. Transp. Syst., Oct. 2011, pp. 580–1585.

[14] A. K. Mittal and D. Bhandari, "A novel approach to implement green wave system and detection of stolen vehicles," in Proc. IEEE 3rd Int.Adv. Comput., Feb. 2013, pp. 1055–1059.

[15] S. Sharma, A. Pithora, G. Gupta, M. Goel, and M. Sinha, "Traffic light priority control for emergency vehicle using RFID,"Int. J. Innov. Eng.Technol., vol. 2, no. 2, pp.363–366, 2013.

[16]Md. Mazharul Hoque, Zobair Ibn Awal, Sabreena Anowar, Shahnewaz Hasanat-E Rabbi and S. M. Sohel Mahmud, "Road Safety Research Needs and the Role of Accident Research Centre (ARC)", Proceedings of the National Symposium on Engineering and Technological Education (NSET) BUET, pp. 95-100, 29 December, 2007.

[17] M. M. Hoque, S. M. S. Mahmud and S. Paul, "The Cost of Road Traffic Accidents in Bangladesh", 10th Pacific Regional Science Conference Organization (PRSCO) Summer Institute 2008 Bangladesh Regional Science Association (BRSA), pp. 88, 15-17 May, 2008.