

SMART TRAFFIC CONTROL SYSTEM FOR CLEARANCE TO EMERGENCY VEHICLES USING ARDUINO SOFTWARE

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Abstract— The paper mainly focuses on how smart the traffic controlling is being done. In India as the population is being increasing day by day the traffic is also increasing with proportionality. So the traffic signals need good coordination for the smooth flow of traffic during the busy hours as the traffic is at peaks. In order to avoid traffic jams when the emergency vehicles are passing towards the junction this paper is being implemented. Each vehicle is equipped with the RFID tag which can't be removed or destroyed. When the emergency vehicle reaches the junction point the RFID reader reads the signals and shows a green wave so that it can move smoothly without any jam. Automatically when it crosses the signal point the signal gets changed. This is done by considering the multi road junction point. .

Index terms- RFID Reader, 16x2 LCD Display, SIM300, LED'S, ATMEGA328 Microcontroller, RF Receiver, transmitter Module.

I. INTRODUCTION

In the developing country like India growth of population adversely increases. With the increase in population the traffic is rapidly increasing and so bundle of problems too; these problems include traffic jams, accidents and traffic violation at the heavy traffic signal. This in turn has an adverse effect on the economy of the country as well as loss of lives. These all occurs because there were no separate lanes constructed in India.

The first traffic lights were introduced in London in 1868 and from then they came into existence and now they were implemented with many existing techniques in cities. So in order to avoid these problems here in this project we have introduced an RFID based vehicular system. An RFID receiver and transmitter and being used to receive and transmit the information from the emergency vehicles to the signal points. In case if your vehicle is stolen then the RFID tag present in the vehicles are being matched and if it is correctly matched then when it comes nearer to signal point a red light blinks and so we can come to know that the vehicle is the stolen vehicle and a message is being sent to the police station that the vehicle is at certain signal point and also the persons who belongs to that vehicle.

II. LITERATURE SURVEY:

Green wave system was discussed which was used to provide clearance to any emergency vehicles by turning all the red lights to green on the path of the emergency vehicles. A green wave is synchronized and it continues to receive the signal until it travel down the road. And it is also used to track the stolen vehicle when it passes through the traffic signal. Here we have observed the disadvantage in the survey that when the wave gets disturbed the disturbances cause the traffic problem. RFID technique deals with multi lane multi junction areas. It provides efficient time management schemes by counting the number of vehicles and controls the traffic near the signal. The use of RFID distinguishes between the emergency and non emergency vehicles thus preventing the unnecessary traffic congestion. The communication is done through the transceiver and receiver and the system is fully automated and there was less need of human intervention. The disadvantage of this system was it needs information of starting and ending point of the travel. It may not work if the ambulance needs to take any another route if emergency.

III. WORKING MODEL

The disadvantages mentioned in the literature survey are overcome and new methods are being implemented in this system. There are three major operations that are being done in this system. The first is the automatic signal controlling, second is the stolen vehicle detection and the last is the emergency vehicle clearance system.

A. AUTOMATIC SIGNAL CONTROLLING:

Each vehicle is equipped with an RFID tag when it comes in the range of RFID reader, it will send the signal to the RFID reader. The RFID reader will track the how many vehicles have passed through for a specific period and determine the congestion volume. Accordingly, it sets the green wave path when the emergency vehicles.

B. STOLEN VEHICLE DETECTION METHOD:

Every vehicle is equipped with an RFID tag which cannot be removed or even destroyed. If our vehicle is stolen and we complaint in the police station then at the signal points the RFID reader reads the RFID tag numbers and matches the

every number with the stolen number and in that case if the match is found, then it automatically sends SMS to the police control room and the person who belongs to that vehicle and then changes the traffic light to red, so that the vehicle is made to stop in the traffic junction and local police can take appropriate action.

C. EMERGENCY VEHICLE CLEARANCE SYSTEM:

Each vehicle contains RF MODULE with the transmitter and receiver implemented at the traffic junction. And also in the ambulance unit. And a buzzer is placed in the ambulance to switch on when the vehicle is used for the emergency purpose. A green wave is shown when the vehicle reaches the junction point so that it can move smoothly without any traffic jams and waste the time near the junction in emergency condition and when it passes away from the junction automatically the green is changed to red. Here there was no need of giving the starting and ending point of the travel. So this system works even if the ambulance needs to take another route if in emergency condition. When it takes another route then the receiver at that route sends the information to the RF receiver placed at the junction that the emergency vehicle has passed in this way so it can change the signal green to red and work in the normal way. In this way the system is being used.

IV. CONCLUSION

The design and implementation of this technique is directly targeted for traffic management so that emergency vehicles on road move smoothly without any traffic jam till it reaches the destination in the less time and without any human interruption. It also controls the traffic congestion of the system and identifies the stolen vehicle if the vehicle is being stolen.

REFERENCES

- [1] Sundar, Santhosh Hebbar, and Varaprasad Golla "Implementing Intelligent Traffic Control System for Congestion Control, Ambulance Clearance, and Stolen Vehicle Detection".
- [2] A Ranganath, T Sree Valli " Intelligent Mangement System For Density Based Control, Stolen Vehicle And Auto Clerance.
- [3] Pavithra Poornima. S" Traffic surveillance and vehicle identification in ghat curves using Arduino.
- [4] 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.
- [5] *ZigBee Specifications*, ZigBee Alliance IEEE Standard 802.15.4k2013, 2014. [Online]. Available: <http://www.zigbee.org/Specifications.aspx>
- [6] *Traffic Congestion in Bangalore—A Rising Concern*. [Online]. Available: <http://www.commonfloor.com/guide/traffic-congestion-in-bangalore-arising-concern-27238.html>, accessed 2013.
- [7] 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.
- [8] 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.
- [9] 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.
- [10] P. Sood. *Bangalore Traffic Police-Preparing for the Future*. [Online]. Available: <http://www.intranse.in/its1/sites/default/files/D1-S2->, accessed 2011.
- [11] *Traffic Management Centre*. [Online]. Available: http://www.bangaloretrafficpolice.gov.in/index.php?Option=com_content&view=article&id=87&btp=87, accessed 2014.
- [12] G. Varaprasad, "High stable power aware multicast algorithm for mobile ad hoc networks," *IEEE Sensors J.*, vol. 13, no. 5, pp. 1442–1446, May 2013.
- [13] *Traffic Solution*. [Online]. Available: <http://phys.org/news/2013-05-physics-green-city-traffic-smoothly.html>, accessed 2013
- [14] "Hi-Fi Traffic Clearance Technique for Life Saving Vehicles Using Differential GPS System", Yuvaraj.N, Prakash.V.B., Venkatraj.D., World Academy of Science, Engineering and Technology, 2011.
- [15]. "Traffic Control by Bluetooth Enabled Mobile Phone", Manikandan.G, Srinivasan.S., International Journal of Computer & Communication Engineering vol.1, No.1, May 2012.
- [16]. "The Role of Zigbee Technology in Future Data Communication System", Riaz Ahamed. S.S., Journal of Theoretical and Applied Information Technology 2005 – 2009.

- [17]. “*RFID and GPS based Automatic Lane Clearance System for Ambulance*”, Rashmi Hegde, Rohith R. Sali & Indira.M.S., IJAEE Volume-2, Issue-3, 2013.
- [18]. “*Evaluation of emergency vehicle signal preemption on the route 7 virginia corridor*”, Bullock, D, Morales, J M Sanderson Jr, Transportation research board of the national academies1999-7
- [19]. “*Automatic Ambulance escueSystem*”, Athvan.K, Jagadaeeshwaran.S, Balasubramanian.G.B,Dinesh. N,
- [20]. Abhilash.G,Gokul.G, International Journal Of Advanced Tech&Engg. Research,Vol 2,Issue 2, May 2012