iJRASET
International Journal For Research in Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 3 **Issue:** V **Month of publication:** May 2015

DOI:

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www.ijraset.com
IC Value: 13.98
Volume 3 Issue V, May 2015
ISSN: 2321-9653
International Journal for Research in Applied Science & Engineering Technology (IJRASET)

Traffic surveillance and vehicle identification in ghat curves using Arduino

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Abstract— Arduino is a great device for collecting, storing and transferring data from various sensors but there are times you need to make your data accessible from any place over the internet. The solution could be still advanced by developing a cloud based real time web publishing application that allows publishing any data with latency of 0.1 second. A robust real time vehicle detection algorithm for both signals is developed. Magnetic sensors turned out to be superior, achieving detection rates above 97% in the field, and led to the abandonment of future research using acoustic sensors. Vehicle classification and re identification schemes for low cost, low power platforms with very limited computation resources are developed and tested. The vehicle classification algorithms require orders of magnitude fewer computation resources while achieving correct classification rates comparable to the best of all published vehicle classification schemes inn tests with a large database, including 800 trucks. The algorithm for vehicle re identification is tested on a limited left-turn re identification experiment. The result is encouraging, but much more work is needed.

Keywords: Arduino Uno, ATMEGA 328 Ethernet Shield, RFID system, IR sensors, Buzzer, LCD

I. INTRODUCTION

With the implementation of intelligent transportation system (ITS) for system management purposes, there is now the ability to extract archived data that can be used to evaluate the implementation of new strategies. In recognition of the need to provide feedback to decision makers, efforts are underway to provide rigorous documentation of ITS benefits and cost. In recent years, video monitoring and surveillance systems have been widely used in traffic management. Hence, traffic density estimation and vehicle classification can be achieved using video monitoring systems. In most vehicle detection methods in the literature, only the detection of vehicles in frames of the given vivideo is emphasized. However further analysis is needed in order to obtain the useful information for traffic management such as real traffic density and number of vehicle types passing the roads. Safe and efficient operations of transportation systems rely heavily on applications of advanced technologies. Also recent decades have witnessed wide applications of communication, sensing, and computing technologies in traffic surveillance, incident detection, emergency response, fleet management and travel assistances.

II. SYSTEM STRUCTURE AND BLOCK DIAGRAM

The Arduino UNO serves as the decision-making device uses an Atmega328 controller. A couple of infra-red sensors/ Ultrasonic's and a RFID Reader are interfaced to the controller as inputs. The outputs are observed on Traffic lights and LCD can display all the status messages.

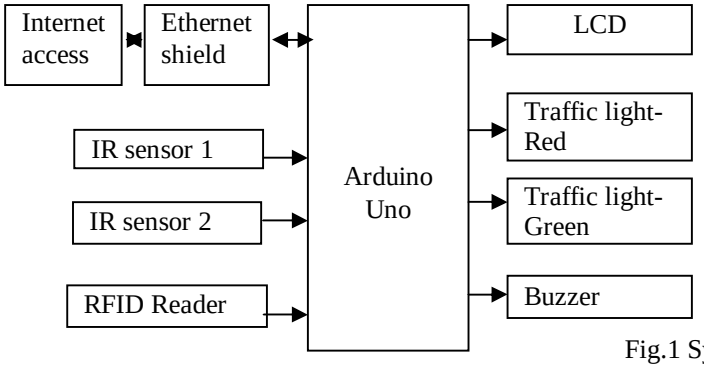


Fig.1 System structure

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III. SYSTEM HARDWARE

A. Arduino

Arduino is a microcontroller of a single board which is designed to access the multidisciplinary based project of electronics. The arduino hardware is a simple open source hardware board and the software consists of a standard programming language compiler and boot loader that executes on the microcontroller. The arduino is also known as a physical or embedded computing platform can program to process inputs and outputs between the device and other external components that connected to it.

B. IR sensor

An IR sensor is a device which detects IR radiation falling on it. There are many types of IR sensors that are built and can be built depending on the applications. Priority Sensors (It is used in Touch Screen phones and Edge avoiding Robots), Contrast Sensors (which is used in line following Robots) and obstruction sensors (used for counting goods and in alarm). An IR sensor is a device and it basically consists of an IR LED and a photodiode which are collectively known as Photo-coupler or an Opto-coupler. The IR LED emits the IR radiation, reception and intensity of reception of which by the photodiode dictates the output of the sensor. And there are so many ways by which the radiation may or may not be able to reach the photodiode.

C. RFID system

RFID means Radio frequency identification. RFID is a wireless use of electromagnetic fields to transfer of data which is electronically stored for the purpose of automatically identifying and tracking tags attached to the object. So it is one of the methods for Automatic identification and Data capture (AIDC). This technique uses devices called RFID tags, also known as transponders. The RFID tags which relies on data storage and transreceiving of data. There is a one more device called RFID reader, which is a contactless technology that initiates tag by power transfer. The mode of communication between The RFID Reader and tag of the system is called Radio frequency technology.

D. LCD display

LCD (Liquid crystal display) screen is an electronic display module and find a wide range of applications. A 16x2 LCD display is very basic module and is very commonly used in various devices and circuits. These modules are preferred over seven segments and other multi segment LEDs. The reason being: LCDs are economical, easily programmable, have no limitations of displaying special and even custom characters (unlike in seven segments), animations and so on. A 16x2 LCD means it can display 16 characters per line and there are 2 such lines. In this LCD each character is displayed in 5x7 pixel matrix. This LCD has two registers, namely command and data.

IV. FLOW CHART OF SYSTEM SOFTWARE

The Flow chart gives the basic algorithm of the software developed for the entire system. In this system, there is an initialization of the input variables such as Input sensors and Output variables such as Buzzer and traffic light. The value of the buzzer is low initially. The traffic light green is set as a high as a default. If there any vehicle detects in any zone in the ghat curve then the traffic light Red will be high and the timer starts counting from the zero value. After the first interrupt of the IR sensor, there is an RFID Reader that reads the Tag information of the vehicle. The tag information then sent into the data monitoring system. If there is no interrupt by the IR sensors, no action takes place. It continues to checking the Zone.

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Volume 3 Issue V, May 2015
ISSN: 2321-9653
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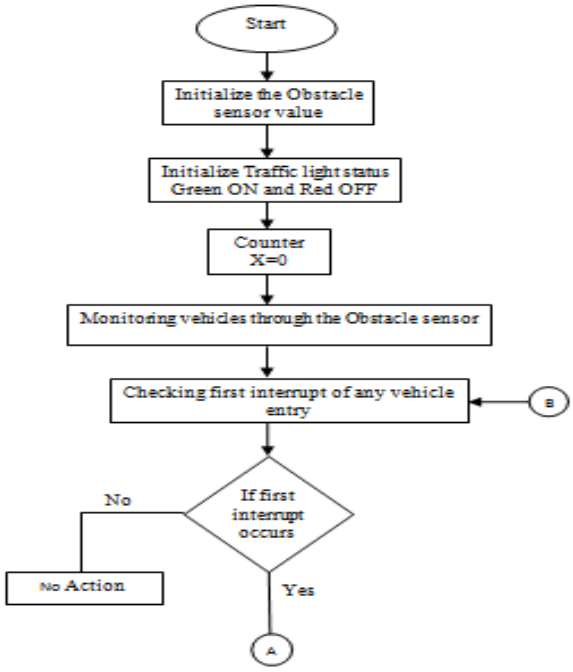


Fig. 2 Flow chart of the system

If the timer exceeds its threshold value, it means the second interrupt of the vehicle exit is not occur, then buzzer will be high and the information is displayed in the LCD as a TRAFFIC JAM. The Buzzer stops when there will be a second interrupt. If the there is a second interrupt of the vehicle exit then the timer stops running. The Ethernet is connected with the arduino to access the information about the vehicle in the web page.

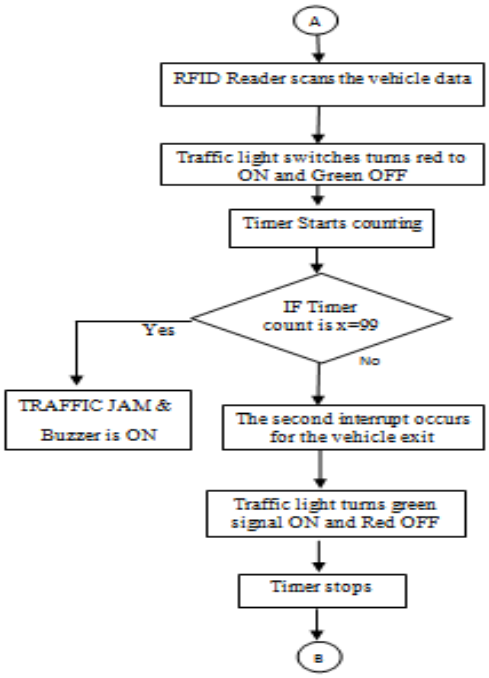


Fig.2 Flow graph of the system (contd)

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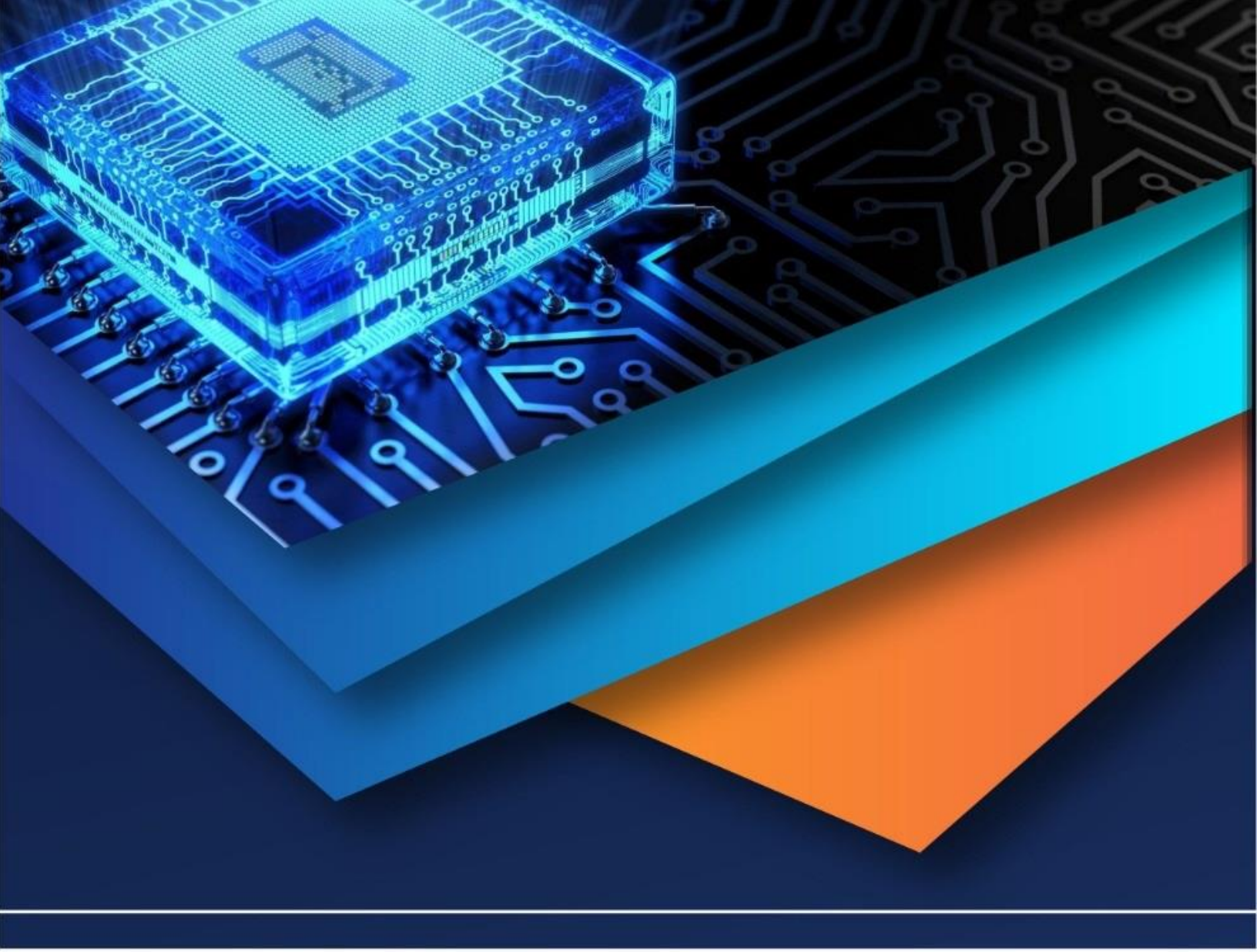
V. RESULTS AND CONCLUSION

The Program was successfully executed on the arduino microcontroller. When a vehicle interrupts the sensor the traffic light changes from green to red and reader reads the tag information of the vehicle and that data is sent to the data base monitoring system. The vehicle in the ghat curves are supposed to interrupt the sensor in the two zones of the ghat curves. If the vehicle is not interrupted the sensor for the second time and if the timer exceeds the threshold value then the buzzer will be on to indicate the traffic jam and Arduino displays a message in Liquid crystal display. The vehicle information can be accessed through the internet by using Arduino Ethernet shield. The system can be improved by adding the cameras and this present system uses only two tags and the number of tags can be added in the software programs.

REFERENCES

[1] Ayush kr. Mittal and Deepika Bhandari, A Novel approach to implement Green wave system and detection of stolen Vehicles, 2013 3rd IEEE International Advance computing conference (IACC), pp 1055-1059.
[2] Janis Jansons, Ernests Petersons, Nikolajs Bogdanovs, WiFi for Vehicular Communication systems, 2013 27th International Conference on Advanced Information Networking and Applications workshop, pp 425-430.
[3] Dinesh Rotake, Prof.SwapniliKarmore, Intelligent traffic control System using Embedded system Innovative systems Design and Engg., vol. 3, No 5, 2012, pp 11-20.
[4] G.Persy Grace, Research scholar and Krishna Kishore, Traffic Surveillance using radar Interferometry, International Journal of Electronics and Communication (ITGCE) Vol. 2, Issue 5, Nov 2013, pp 139-150.
[5] J.M.Munoz-Ferreras, F.Perez-Martinez, Member, IEEE, J.Calvo-Gallego, A.Asensio-Lopez, b.P.Dorta-naranjo and A.Blanco-del-Campco, Student member, IEEE, Traffic Surveillance System based on a High-resolution Radar, IEEE Transactions on Geo science and remote Sensing,Vol.46, NO. 6, June 2008, pp 1624-1633.
[6] Farheena sheikh, Dr.Prof. M.B. Chandak, An Approach towards Traffic Management system using Density Calculation and Emergency alert, IOSR Journal of Computer Science, pp: 24-27
[7] Sing Yiu Cheung, Sinem Coleri Ergen and PravinVaraiya, Traffic Surveillance with Wireless Magnetic Sensors, University of California, pp 4779.
[8] Gurjot Singh Gaba , Nancy Gupta , Gaurav Sharma, Harsimranjitsingh Gill, Intelligent Cars using RFID Technology, International Journal of scientific &Engineering Research Volume3, Issue 7, June 2012, pp 1-4.
[9] Mohamed Amine Kafi, Yacine Challal, Djamel Djenouri, Abdelmadjid Bouabdallah, Lyes Khelladinadjib badache ,A study of Wireless Sensor Network Architectures and projects For Traffic Light Monitoring, ANT12. The 3rd International Conference on Ambient Systems, Networks and Technologies, 2012, pp 1-11.
[10] Padmavathi. S , Keerthana Gunasekaran, Night time vehicle Detection for Real Time Traffic Monitoring Systems: A Review, International Journal Computer technology & Applications, Vol. 5(2), pp 451-456.
[11] Dr. Swapan Kumar Deb, Rajiv Kumar Nathr. Vehicle Detection Based on Video for Traffic Surveillance on road, Vol3, No4, August 2012, pp121-137.
[12] Ms. Promila sinhmar, Intelligent Traffic Light and Density Control using IR sensors and Microcontroller, International Journal of Advanced Technology and Engg, Research (IJATER), pp 30-35

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