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An Intelligence System for Video Surveillance in IoT Environment

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ABSTRACT: The main objective of this project is to share visual information on Collision Detection, Location of Accident and Traffic Information with nearby Hospitals and Police station. Here the camera sends the video automatically to a cloud based network for multiple access by individual cloud customers. In this project, the camera is continuously monitoring the events and is connected to the cloud network via the internet. The information stored in the cloud network can be accessed by other people to control traffic flows and handle emergency situations as and when they arise in near real time. Using this, the response time can be reduced

KEYWORDS: Internet of Things; Arduino Uno R3; Android App

I. INTRODUCTION

Detection of object moving in an image sequences is crucial issue of moving video. A most common issue in the detection of moving object is the presence of ego motion. We resolve it by computing the dominant motion. Visual surveillance is the active research area in computer vision. The use of this concept in surveillance for security, controlling the traffic without any jamming by other vehicles. The main task includes the motion detection, object classification, tracking activity. The detection of objects moving in video streams is the first relevant step of information extraction in many computer vision applications. Many accident occurs which are not informed at correct time which needs to be monitored therefore need to use security and surveillance systems that are equipped with latest technology. Intelligent video surveillance were developed to support security systems to detect unexpected movement without human intervention. The important information of movement, location, speed and any desired information of target from the captured frames can be taken from the camera and can be transferred to the analysis part of the system. Movement detection is one of these intelligent systems to which detect and tracks moving targets. There are different methods to detect the objects moving but these methods having some limitations for real time application. Because to this reason, in this paper we go for background subtraction method, which is suitable for real time application which gives accurate result.

.II. LITERATURE SURVEY

- In the paper [1], " An IOT Based ATM Surveillance System.", Published in 2017 IEEE International Conference on Computational Intelligence and Computing Research (ICIC),on 14-16 Dec. 2017
- In the paper [2], "IOT Based Monitoring and Control Device.", International Journal for Research in Applied Science & Engineering Technology (IJRASET), Volume 5 Issue VI, June 2017
- In the paper[3], " IOT Based Smart Surveillance System ",International Journal of Advance Research and Development(IJND),Volume 3 Issue 2,on march 2018



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III. PROPOSED SYSTEM

In this paper we use a method in which single static camera to capture video for that captured video are converted into no of frames and apply background subtraction method with updating background. Tracking objects moving in cluttered scene is also done by background modelling. Two processes involved in this method where the technique to extract an initial background model when background situation changes, After that in later time knowledge segmentation and edge detection is used in this modelling. Different types of objects which are moving shows similarities but also express differences in terms of their dynamic behaviour and the nature of object movement. The vehicle which is in the movement is detected. The vehicle which moves in high speed and about to hit/collide is measured using the video frames. when collision occurs information is sent to the cloud network via internet and for application which can be accessed.

IV.OBJECTIVE OF THE PROJECT

The main objective of the project is to monitor continuously the traffic and if there is any accident occurs it has to be updated to the nearby hospital and police station for emergency but it can't be done as real time hence we go for video detection of any collision occurs and immediate updating via cloud and application

A. BLOCK DIAGRAM

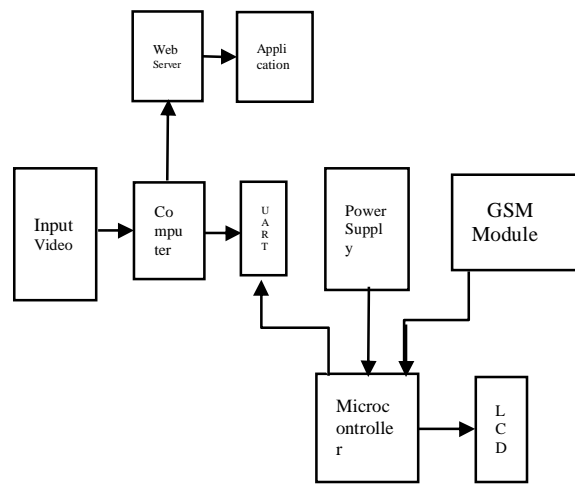


Fig 1 Block Diagram

HARDWARE USED

1.USB To RS232 CABLE

The USB RS232 cables are a family of USB to RS232 levels serial UART converter cables which is incorporating FTDI [FT232RL](#) USB to serial UART interface IC device that handles all the USB signalling and protocols. This cables provide a fast and simple way to connect devices with a RS232 level serial UART interface to USB. Each USB-RS232 cable have a small internal electronic circuit board, utilizing the [FT232R](#), which is encapsulated into the USB connector end of the cable. The integrated electronics also include the RS232 level shifter, Transmitter and Receiver. LEDs which give a visual indication to the cable.



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2. GSM MODULE

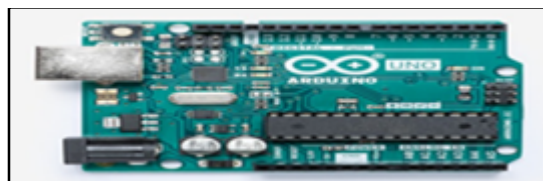
This GSM Modem can accept whatever the GSM network and this act as SIM card and just like a mobile phone with its own unique phone number. Advantage of using this GSM modem will be the use of its RS232 port to communicate and develop embedded applications. The SIM800C is a complete Dual-band GSM or GPRS solution in a SMT module of featuring an industry-standard interface, the SIM800CS is a quad-band GSM or GPRS module which is working on frequencies GSM850MHz, and delivers performance for voice, SMS, Data, and Fax in a small form factor and with low power consumption.



Fig 2. GSM Module

3. ARDUINO UNO

Arduino Uno is a microcontroller board. The board is based on the ATmega328P. It has 14 digital input or output pins in which 6 can be used as PWM outputs, 6 ports are analog inputs, a 16 MHz quartz crystal, USB connection, power jack, ICSP header and reset button. It contains everything which are needed to support the microcontroller; simply we have connect it to a computer with a USB cable or to power it with a AC-to-DC adapter or with battery to get started



IMPLEMENTATION

In this venture work, Arduino is utilized for serial port communication process of updating the data in cloud continuously via the RS232 cable when the accident is occurred. After the uploading of cloud, using GPRS the location of the accident occurred area is indicated in the application

SOFTWARE INTEGRATION

- Download the MATLAB 2014b software
- Extract on the work area the accident detection, you discover it in the record accident detection.zip
- Run the MATLAB 2014b with the code after the collision occur
- The ARDUINO microcontroller is connected for data server up process
- From the given data webpage is uploaded in cloud
- Using GSM Module the location is send to the application
- Then the application notifies with the location that ACCIDENT DETECTED



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Without any collision the road is empty ,the background of the area is monitored and noted for the further detection process



Fig4 Road with no collision

After the collision the background of the hited car over the side block of the flyover which is sensed by comparing the normal background and with this background and then the information is send to the cloud as ACCIDENT DETECTED

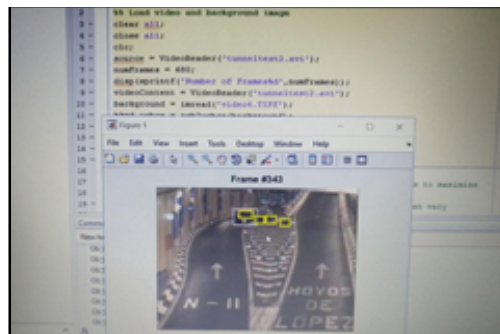


Fig5 Road with the car collided

when the accident occurs the information of this accident is send to the public via application as accident in the particular area hence they get diverted to the other direction without any jamming in that road and making traffic problem



Fig6 Road without jammed by other vehicles



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VI. RESULT

WEB SERVER CLOUD

As a result of the cloud updating we can send the information to the police station with the date and time of the accident as ACCIDENT DETECTION



Fig 7. Cloud website

APPLICATION

At last after sending information via cloud we send the location alert for the public user for avoiding jamming of the road by other vehicles near the accident occurred area

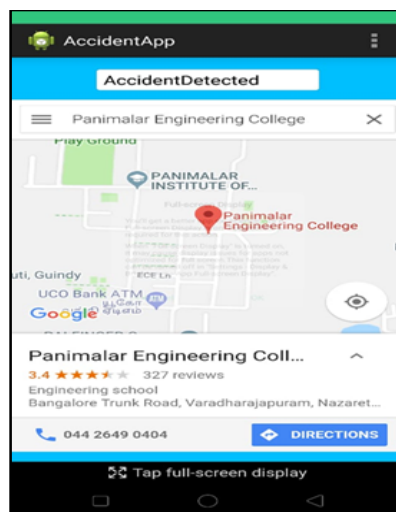


Fig 8. application



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VI. CONCLUSION

So according to this paper the work on the Arduino, MATLAB and Internet of Things make the detection of the accident and notifies simultaneously for both user and for emergency alert. In future there will be the updating of the notification with the more accurate speed and detection with more difficulties of identification

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