IOT BASED DRIVER MONITORING SYSTEM USING BODY SENSOR NETWORK

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Abstract---The concept of IOT for vehicle tracking, accident detection and prevention. First, Alcohol sensor will check whether the driver is drunk or not. Vibration Sensor measures the vibration produced in vehicle, when the vibrations are produced and Mechanical switch is pressed then the accident is detected. The proposed system works on IOT. The IOT sends current location of the vehicle; sends the tracking information to the server and the GSM is used for sending alert message to near-by ambulance, mechanic and relatives of victim. There-by, the ambulance brings along an AED in a sudden event of cardiac arrest and facilitates various modes of operation. The prototypes with biomedical sensors are used for monitoring the patient health continuously

I. INTRODUCTION

Health is one of the sustainable development areas in all of the countries. Internet of Things has a variety of use in this sector which was not studied yet. The Aim of this research is to prioritize IoT usage in the healthcare sector to achieve Sustainable development. Globally, a significant number of deaths occur each year, caused by excessive Delays in rescue activities. Vehicles embedded with sophisticated technologies, along with roads equipped with advanced infrastructure, can play a vital role in the timely identification and notification of roadside Incidents.

II. OBJECTIVE

Traffic accidents are a major public issue worldwide. The huge number of injuries and death as a result of road traffic accident uncovers the story of global crisis of road safety. Road collisions are the second leading cause of death for people between the ages of 5 and 29 and third leading cause for people between 30 and 44.

According to statistical projection of traffic fatalities, the two-year comparison of total driver participation in mortal crashes presented a three percent increase from 43,840 in 2011 to 45,337 in 2012. Additionally 184,000 young drivers (15 to 20 years old) were injured in vehicle crashes, in 2012, an increase of two percent from 180,000 in 2011.

Nowadays accidents are in huge numbers and it is mainly due to negligence of the driver. People drink and drive and hence the roads are not at all safe for other vehicles as well as the pedestrians. Another reason why there are accidents on road is drowsiness.

Driver of the vehicle tends to get tired and sleep while driving, causing accidents. After the accident, sometimes due to delay in arrival of the medical facilities, the injured person may die. These problems have been analyzed and a system

has been proposed.

Arduino is the heart of the system which helps in transferring the message to different devices in the system. Vibration sensor will be activated when the accident occurs and the information is transferred to the registered number through GSM module. GPS system will help in finding the location of the accident spot.

The proposed system will check whether an accident has occurred and notifies to nearest medical centers and registered mobile numbers about the place of accident using IoT module. The location can be sent through tracking system to cover the geographical coordinates over the area. The accident can be detected by a vibration sensor which is used as major module in the system.

III. LITERATURE SURVEY

A. IMPACT OF DFIG VIRTUAL INERTIA CONTROL ON POWER SYSTEM SMALL-SIGNAL STABILITY CONSIDERING THE PHASE-LOCKED LOOP

DESCRIPTION

Doubly fed induction generator (DFIG) wind turbines with virtual inertia control are coupled to power system in dynamic characteristics, and the control input of virtual inertia control is directly affected by the tracking ability of phase-locked loop (PLL). Thus, it is urgent to study the impact of DFIG wind turbines with virtual inertia control on power system small-signal stability considering the effects of PLL. First, based on DFIG operation characteristic and control strategy, a small-signal model of interconnected system with DFIG integration considering PLL and virtual inertial control is established. Second, the attenuation time constants of DFIG state variables are calculated, and according to the attenuation speeds of different state variables and the coupling between them, it is found out that PLL and virtual inertia are the main factors that affect the coupling between DFIG and synchronous generators.

B. CLOUD SYSTEM FOR TRAFFIC MONITORING AND VEHICULAR ACCIDENTS PREVENTION BASED ON MOBILE SENSOR DATA PROCESSING

DESCRIPTION

The sudden traffic slowdown especially in fast scrolling roads and highways characterized by a scarce visibility is one of the major causes of accidents among motorized vehicles. It can be caused by other accidents, work-in-progress on roads, excessive motorized vehicles especially at peak times and so on. Typically, fixed traffic sensors installed on roads that interact with drivers' mobile App through the 4G network can mitigate such a problem, but unfortunately not all roads and highways are equipped with such devices. In this paper, we discuss a possible alternative solution for addressing such an issue considering mobile traffic sensors directly installed in private and/or public transportation and volunteer vehicles. In this scenario a fast real-time processing of big traffic data is fundamental to prevent accidents.

C. TIMELY AND RELIABLE PACKETS DELIVERY OVER INTERNET OF VEHICLES FOR ROAD ACCIDENTS PREVENTION

DESCRIPTION

With the envisioned era of internet of things, all aspects of Intelligent Transportation Systems will be connected to improve transport safety, relieve traffic congestion, reduce air pollution, enhance the comfort of transportation and significantly reduce road accidents. In internet of vehicles, regular exchange of current

position, direction, and velocity and so on, enables mobile vehicles to predict an upcoming accident and alert the human drivers in time or proactively take precautionary actions to avoid the accident. The actualization of this concept requires the use of channel access protocols that can guarantee reliable and timely broadcast of safety messages. This study investigates the application of network coding concept to increase content of every transmission and achieve improved broadcast reliability with less number of retransmissions.

D. CSI-BASED UBIQUITOUS SMOKING DETECTION SYSTEM

DESCRIPTION

Even though indoor smoking ban is being put into practice in civilized countries, existing vision or sensor-based smoking detection methods cannot provide ubiquitous detection service. In this paper, we take the first attempt to build a ubiquitous passive smoking detection system, Smokey, which leverages the patterns smoking leaves on Wi-Fi signal to identify the smoking activity even in the non-line-of-sight and through-wall environments. We study the behaviors of smokers and leverage the common features to recognize the series of motions during smoking, avoiding the target-dependent training set to achieve the high accuracy. We design a foreground detection-based motion acquisition method to extract the meaningful information from multiple noisy subcarriers even influenced by posture changes. Without the requirement of target's compliance, we leverage the rhythmical patterns of smoking to detect the smoking activities. We also leverage the diversity of multiple antennas to enhance the robustness of Smokey. Due to the convenience of integrating new antennas, Smokey is scalable in practice for ubiquitous smoking detection.

E. AUTOMATIC SMOKY VEHICLE DETECTION FROM TRAFFIC SURVEILLANCE VIDEO BASED ON VEHICLE REAR DETECTION AND MULTI-FEATURE FUSION

DESCRIPTION

Smoky vehicle emissions remain a significant contributor in many areas where air quality standards are under threat. The existing smoky vehicle detection methods are inefficiency and with high false alarm rate. This study presents an automatic detection method of smoky vehicles from traffic surveillance video based on vehicle rear detection and multi-feature fusion. In this method, the Vibe background subtraction algorithm is utilized to detect foreground objects, and some rules are used to remove non-vehicle objects. To obtain the key region behind the vehicle rear where the most possible has black smoke in, an improved integral projection method is proposed to detect vehicle rear.

IV. EXISTING SYSTEM

The fixed monitoring system were used only when the patient is lying on bed and these systems are huge and are only available in the hospitals in ICU. Soon after the accident is detected continuous monitoring of patient were not done. Patients were not taken to the hospital immediately. In existing system there is no alcohol sensor. The controller alerts the caretaker about variation in sensor output. The network will intimate the ambulance driver regarding the hospital that is near-by. Thus at last the life is saved. If the vehicle underwent any accident then the controller will give data to the IoT. All the status will be displayed by the IoT. The systems are not portable Complex systems and difficult to operate Continuous monitoring of patient isn't

done Due to traffic, at- times leads to death because of lack of monitoring. In the traditional architecture there existed only offer the server was only a database server that can only offer data. This makes maintains expensive. Such clients are called as fat clients.

V. PROPOSED SYSTEM

The system automatically monitors the individual vehicle speed and when accident happens it intimates police and ambulance by sending message and call simultaneously with the help of IOT. The microcontroller picks up the sensor data and sends it to the network and hence provides real time monitoring of the health care parameters for doctors. The data can be accessed anytime by the doctors. The controller alerts the caretaker about variation in sensor output. The network will intimate the ambulance driver regarding the hospital that is near-by. Thus at last the life is saved. In addition to that we are able to check whether the driver consumed alcohol or not by using alcohol sensor and if anything is identified then the controller will give command to the driver circuit to turn off the vehicle. The accident to the vehicle will be identified by using vibration sensor. If the vehicle underwent any accident then the controller will give data to the IOT. All the status will be displayed by the IOT.

VI. MODULE DESCRIPTION

1. ALCOHOL VERIFICATION
2. HEART RATE MONITOR
3. IOT

ALCOHOL VERIFICATION (MODULE 01)

An alcohol detects the attentiveness of alcohol gas in the air and analogy voltage is an output reading. The sensor can activate at -10 to 50 deg C with a power supply is less than 150 Ma to 5V. The sensing range is from 0.04 mg/L to 4 mg/L, which is suitable for Breathalyzer. The alcohol sensor is to verify when the driver is drunk or not. The sensor is active then it checks driver breathe and it confirms the driver to drive or not to start. Alcohol Sensor for use in Breathalyzer's or in an alarm unit, to detect the presence of alcohol vapors. This sensor unit offers very high sensitivity, combined with a fast response time. The unit will work with a simple drive circuit and offers excellent stability with long life. When all the acetic acid is cleared out of the FUEL CELL, the instrument is ready to analyze another sample.

Fig.1: Alcohol Sensor

HEART RATE MONITOR (MODULE 02)

Heart Rate sensor is designed to give digital output of heat RATE when a finger is placed on it. When the HEART RATE detector is working, the RATE LED flashes in unison with each heart rate. This digital output can be connected to microcontroller directly to measure the RATEs per Minute (BPM) rate. It works on the principle of light modulation by blood flow through finger at each pulse.

Medical heart sensors are capable of monitoring vascular tissue through the tip of the finger or the ear lobe. It is often used for health purposes, especially when monitoring the body after physical training. HEART RATE is sensed by using a high intensity type LED and LDR.

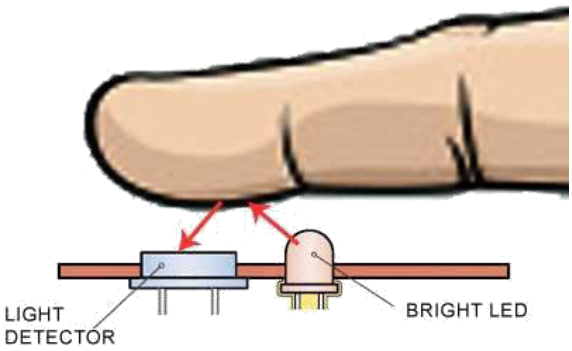

Fig.2: Heart Rate monitor

The finger is placed between the LED and LDR. As Sensor a photo diode or a photo transistor can be used. The skin may be illuminated with visible (red) using transmitted or reflected light for detection. The very small changes in reflectivity or in transmittance caused by the varying blood content of human tissue are almost invisible. Various noise sources may produce disturbance signals with amplitudes equal or even higher than the amplitude of the pulse signal. Valid pulse measurement therefore requires extensive preprocessing of the raw signal. The new signal processing approach presented here combines analog and digital signal processing in a way that both parts can be kept simple but in combination are very effective in suppressing disturbance signals. The setup described here uses a red LED for transmitted light illumination and a LDR as detector. With only slight changes in the preamplifier circuit the same hardware and software could be used with other illumination and detection concepts. The detectors photo current (AC Part) is converted to voltage and amplified by an operational amplifier (LM358).

IOT SENSORS (MODULE 03)

The Internet of Things (IoT) is the network of everyday objects — physical things embedded with electronics, software, sensors, and connectivity enabling data exchange. Basically, a little networked computer is attached to a thing, allowing information exchange to and from that thing. Be it light bulbs, toasters, refrigerators, flower pots, watches, fans, planes, trains, automobiles, or anything else around you, a little networked computer can be combined with it to accept input (especially object control) or to gather and generate informational output (typically object status or other sensory data).

This means computers will be permeating everything around us ubiquitous embedded computing devices, uniquely identifiable, interconnected across the Internet. Because of low-cost, networkable microcontroller modules, the Internet of things is really starting to take off.

1. Vibration sensor
2. GSM
3. GPS

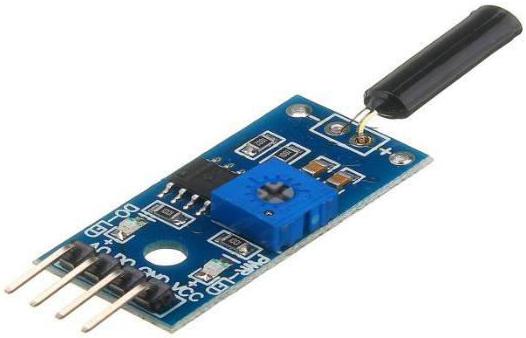

Fig.3: Vibration Sensor

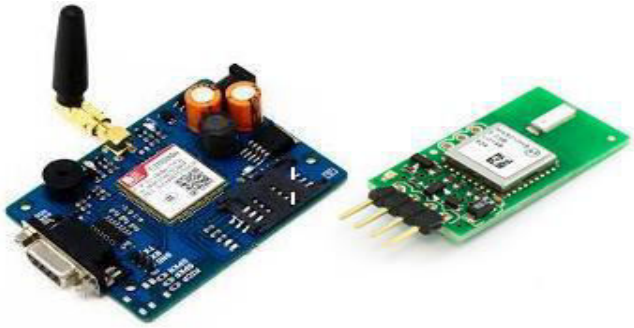

Fig.4: GSM and GPS Module

VII. SYSTEM ARCHITECTURE

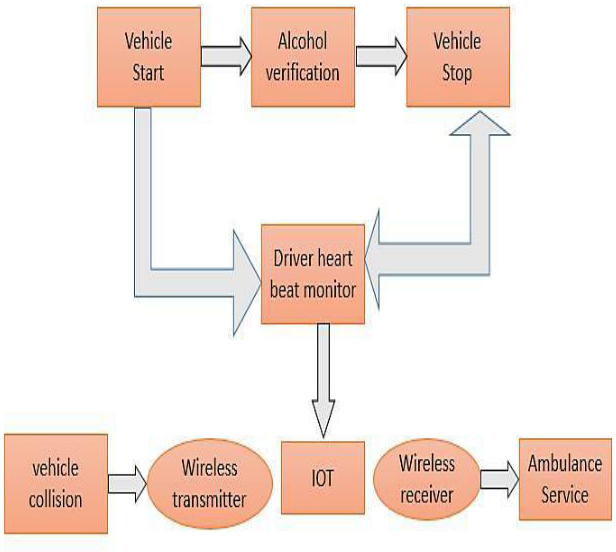

Fig. 5: System Architecture

VIII. RESULT

The Alcohol sensor, vibration sensor, Heartbeat sensor connected with Micro controller. When the person met with an accident and the message (by GSM) will be sent to intimate hospital concern staff. Through this test, we have successfully clarified that people in the car are being monitored and receiving message when an accident occurs.

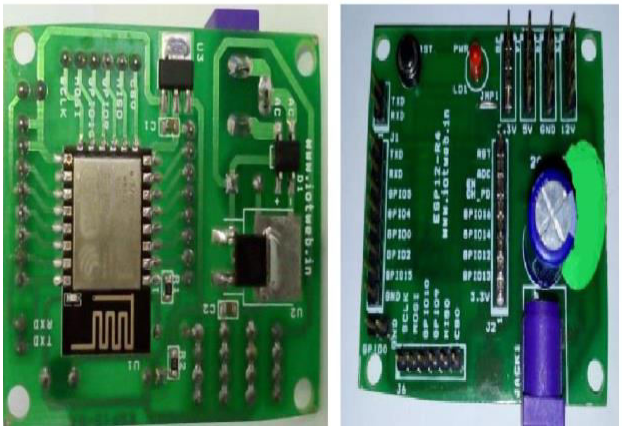

Fig. 6: IOT Sensors

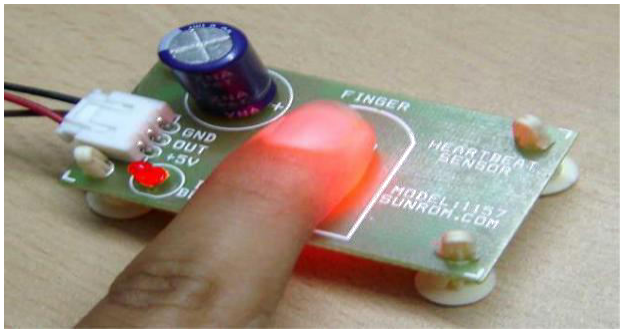

Fig.7: Heart Rate monitoring Sensor

Fig.8: Full Hardware Kit

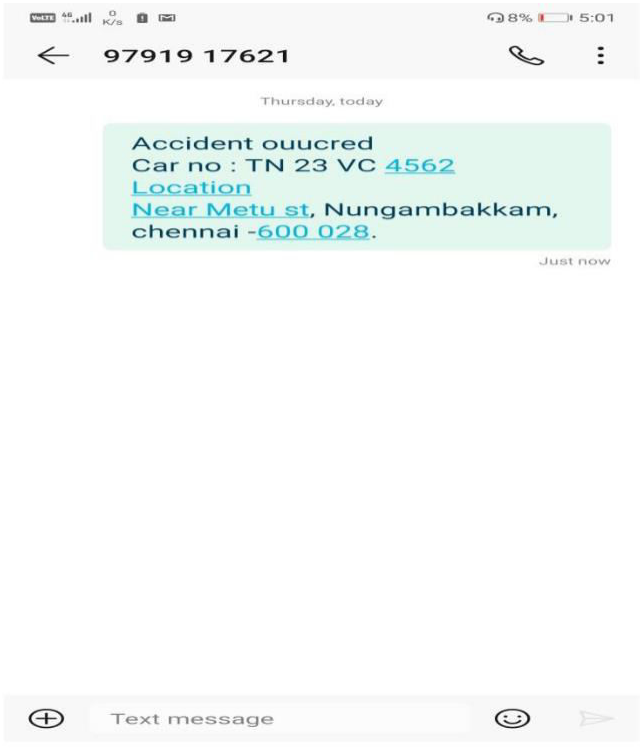

Fig.9: SMS Alert about accident

IX. FUTURE ENHANCEMENT

The following future enhancement can be made into proposed system by devising software algorithms, hardware implantations and interfacing sensors:

1. Solution for drink and drive cases.
2. Solutions for emergency speed control of vehicles.
3. Solution for rash driving by obstructing Spark-plug.
4. Solution for wheel grip using gravity sensor.
5. Voice based real time advice for drivers by their loved ones when they are over-drunk Or Rash-driving.
6. Solution for Preventing Accidents.
7. Solution for Detecting Accidents Using Impact Sensors.
8. Global Photos Transfer using GPRS in Arm 11 Device and Mailing It to Required People.

X. CONCLUSION

The system provides the design which has the advantages of low cost, portability and small size. It consists of vibration sensor, GPS and GSM, interfacing which reduces the accident. It also overcomes a lot of problems of automated system for accident location detection. Consequently ,it reduce the time for searching the location as soon as possible the person can treated immediately it leads to save many lives. Main motto of the accident system project is to decrease the chances of casualties in such accident. This device invention is much more useful for the accidents occurred in deserted places and those occurring at night time. This system will play an important role in day to day life in future.

XI. ACKNOWLEDGEMENT

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XII. REFERENCE

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