



Smart solution on Road safety systems **using IoT**

Literature survey

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LITERATURE SURVEY

1)

Paper Title : NB-IoT based Road Accident Alert System

Authors : Bharath G S , Meghana Bukkapatnam , Hitesh N

Publication : (IJERT) ISSN: 2278-0181 Vol. 11 Issue 03, March-2022

Methodology : Using Long Range Radio (LoRa) and NarrowBand-Iot (NB-IoT),

Abstract : The Safety system Approach within the road transport system is built around the premise that death and injury are unacceptable and avoidable. The paper proposes one such implementation of using a collision detector module to detect an accident. To make sure that the collision is not a false alarm, a Micro-electromechanical systems accelerometer with an ultrasonic sensor is used to get confirmation of an accident at a particular place. Once the confirmation is received, the exact live location of the mishap is attained with the help of the GPRS module's longitude and latitude data coordinates. It consists of Accelerometer, Ultrasonic sensor and Raspberry pi. The module is connected to an ultrasonic sensor which detects obstacles using ultrasonic waves. MEMS accelerometer and impact sensor are interfaced with Analog to digital converter (ADC) then connected to pi 3 for detecting accidents. GPS is interfaced with raspberry pi for finding the exact live location of the vehicle and the buzzer alerts the surrounding nearby ones. The location is sent via NB IoT module SIM7020e which sends an SOS to the emergency services and other concerned persons so the damage can be mitigated.

Advantages : The proposed system is easy to understand and implement. The wide use of sensors reduces error which could aid better performance, The use of NB-IoT will boost the range, enhance network capacity at a comparatively low cost.

Disadvantages : To establish a entire network is quitely costly task

The ultrasonic Sensor has limited range. Temperature Fluctuation affects the speed of an ultrasonic sensors pulse or sound waves.

2)

Paper Title : Accident prevention and road safety in hilly region Using IOT

Authors : Bhumika R, Harshitha S A, Meena D, Asha M

Publication : (IJERT) ISSN: 2278-0181, NCCDS - 2021

Methodology : Using ATMEGA328P Microcontroller

Abstract : The sloping areas are more inclined to mishaps because of the sharp turns, unintentional bends and the vulnerability or newness of the street. GPS/GSM frameworks additionally don't work as expected in these districts. The destination of the work is to reduce the mishaps in hairpin bends and to facilitate smooth and effective developments of vehicles, to prevent the noise pollution caused due to horn, and to help people in emergency and provide the landslide alert. This paper examines a module which means to screen and improve the security in sloping regions by utilizing Wireless Sensor Network and Internet of Things. Remote sensing (WSN) and utilizes self-controlled detecting gadgets at the areas delicate to previously mentioned reasons and afterward these sensors send data to the worker about the chance of a setback. It consists of ATMEGA328P, IR Sensors, RFID, IOT. One sensor is introduced by the side of the difficult segment of the street, correspondingly another sensor is introduced by the side of the declining part of the street. In view of the yield of sensors, position of vehicles on one or the other side of the twist is distinguished which is given as a contribution to the microcontroller. The microcontroller which chips away at force supply of 9V runs a Priority calculation which triggers the admonition LEDs to gleam and consequently wisely controlling the development of vehicles at the curve. Cautioning LEDs alongside an arched mirror are put at the focal point of the external bend of a barrette twist. Another LED is put in request to tell a framework breakdown. Too as we can carry out a ringer which will alarm the client. For speed trap we can calculate speed by the input from sensor and RFID to distinguish the vehicle. An android application will be created for this reason and approved individual can have continuous updates over his telephone.

Advantages : Accident prevention and road safety in hilly region using IoT is an effective method to reduce the occurrence of accidents

Disadvantages : To establish a entire network is quitely costly task

3)

Paper Title : IoT Based Mishap Detection for Safety of Road Transport

Authors : G Lavanya, N Deepika, T Sangeetha, E Harni Priyanga, G Saranya P Vinita

Publication : (EL SEVIER SSRN) ISSN: 1556-5068, ICIOCCT – 2018

Methodology : Using Arduino UNO with Mishop technology

Abstract : Accidents are becoming the major cause for increasing the death rate of human beings in a drastic manner. Even though accident leads to high mortality, the lack of notification within a limited time be a major flaw. This paper mainly focuses on detecting the accident and passes the information to the higher concerns and to the ambulance in order to save the life of the human within the limited time period. As this model concentrate on an optimized solution, it make use of piezoelectric sensor and facial detection module to find heartbeat rate. Web based API is used to notify the higher authorities. It consists of Arduino UNO, Microcontroller, Piezoelectric sensor, TCS3200 color sensor, IOT. When the user is met with an accident, the temperature, pressure, acceleration of the vehicle drastically change from the threshold value. The characteristics that mentioned above are more sensitive and it is difficult to find the particular values of the vehicle in all conditions. As the system concentrate on a optimized solution with interoperability here it make use of the piezoelectric sensor and sends the change to the Arduino. There will be the facial color change of the user if they meet with an accident since they get panic and tensed. The human heartbeat rate also become abnormal. In order to detect those changes the color sensor is employed to sense the facial color change and this information will be sent to the Arduino. During a panic situation there is change in the blood pressure leading to slight change in the facial skin color due to blood circulation. The normal RGB code of driver's skin color can be set as a threshold value to identify the mishap situation.

Advantages : The proposed system which can detect the accidents as soon as possible and intimates the geographical spot of the accident occurred place to the police and ambulance using IoT was implemented and tested.

Disadvantages : Needs external power supply, The design of the system is difficult

4)

Paper Title : Application of IoT in Road Safety

Authors : Srimantini Bhattacharya, Harsh Jha , Radhikesh P. Nanda

Publication : (IRTM) 978-1-6654-7886-1, March 2022

Methodology : Using IoT and Raspberry Pi

Abstract : This paper explores the advancement of the Internet of Things (IoT) and Machine Learning in the field of Road Safety and accident prevention with a state-of-the-art review of various techniques adopted for implementing an intelligent road Safety System. It is seen that, with the help of IoT, the safety system can be updated on a real-time basis which can help to create a smart, intelligent, and highly efficient Road Safety system. Artificial Intelligence (AI) is applied to enhance the technology further for detecting the driver's behavior like drowsiness with the help of real-time camera feed or high-resolution images. IR sensors, camera , GPS , Raspberry Pi and IoT are used in this project. This system detects accidents by vibration sensors, accelerometers. For detection, the GPS and GSM modules locate the accident site and correspondingly inform the person's nearest ones and nearby hospitals through a text message. The system also requires the person that will be riding the bike to have a valid driving license using the already embedded RFID on the driving license. The RFID reader on the bike will have at most ten registered users, hence handling theft-related issues. The prototype is designed using Raspberry Pi, Pi Camera, sensors for monitoring driver's eye movements, detecting yawning, detecting toxic gases, and alcohol consumption to prevent accidents and to provide safety assistance to the drivers. Thereafter the Internet of Things (IoT) and Machine Learning (ML) enabled system is implemented in vehicles for transmitting the behavior of the driver and his driving pattern to the cloud to take quick response under emergencies.

Advantages : These technologies can help optimize the maintenance cost and prevent fatal accidents, thus saving the lives of civilians.

With the help of IoT, the traffic management system gets updated with real-time data, thus increasing the efficiency of the safety system

Disadvantages : Raspberry pi may get slow and not suitable for multitasking