INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA

Impact Factor: 8.379

Accident Detection and Alert System

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ABSTRACT: The objective of this project is to develop an automated system for the detection of accidents and timely alerting of rescue teams to minimize response time and save human lives. Current systems often rely on manual reporting or delayed automated processes, resulting in critical delays in emergency response. The proposed solution aims to bridge this gap by implementing a real-time automated system that promptly detects accidents and provides accurate location information to facilitate swift rescue operations. Key features of the proposed system include the utilization of advanced sensor technologies for accident detection, such as accelerometers and gyroscopes, integrated with GPS modules to precisely determine the location of the incident. Upon detection of an accident, the system triggers an immediate alert to the designated rescue teams, providing them with the latitude and longitude coordinates of the accident site without delay.

KEYWORDS: Accident Detection, GPS, GSM, Arduino

I. INTRODUCTION

Nowadays, the rate of accidents has increased rapidly. Due to employment, the usage of vehicles like cars, bikes have increased, because of this reason the accidents can happen due To over speed. People are going under risk because of their over speed, due to unavailability in the country this paper introduces a solution. Automatic accident detection and alert Systems are introduced The main objective is to control the accidents by sending a message to the registered mobile, hospital and police station using wireless communications Techniques.When an accident occurs in a city or any place, the message is sent to the registered mobile through GSM module in less time. Arduino is the heart of the system which Helps in transferring the message to different devices in the system.

II. OBJECTIVE

The objective is to overcome accidents by monitoring any change in the speed of the vehicle whereas the accelerometer can detect the fall. The Arduino is the major control unit to detect or alert when an accident occurs. It collects the data from the accelerometer, GPS, GSM modules and reflects the output. This will reach the rescue service in time and save lives.

III. PROBLEM STATEMENT

The goal of the project is to detect accidents and alertthe rescue team in time. The gap between the existing systems in placeand the ideal system is that automatedsystem is used once the accident occurs which can give latitude and longitude of accident occurred areawithout delay. More Human life can be saved using this system.

IV. REQUIRED COMPONENTS

ARDUINO UNO: Arduino Uno is a microcontroller board based on theATmega328P. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz ceramic resonator (CSTCE16M0V53-R0), a USB connection, a power jack, an ICSPheader and a reset button.
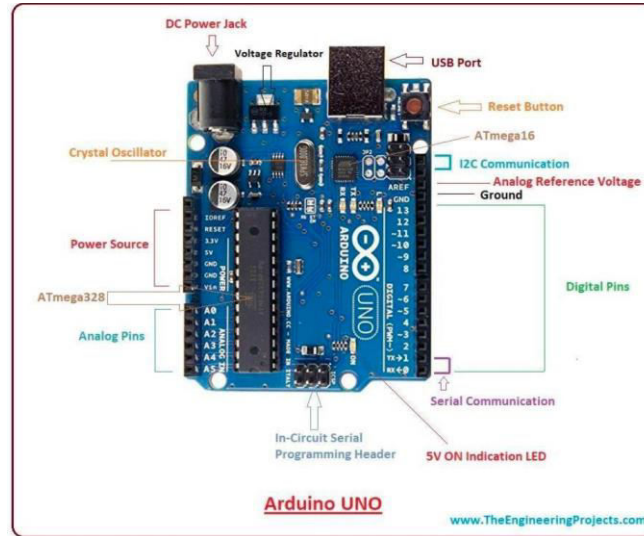
FIG.NO.1. ARDUINO

Power (USB / Barrel Jack): Every Arduino board needs a way to be connected to a power source. The Arduino UNO can be powered from a USB cable coming from your computer or a wall power supply that is terminated in a barrel jack.

NOTE: Do NOT use a power supply greater than 20 Volts as you will overpower (and thereby destroy) your Arduino. The recommended voltage for most Arduino models is between 6 and 12 Volts.

Pins (5V, 3.3V, GND, Analog, Digital, PWM, AREF): The pins on your Arduino are the places where you connect wires to construct a circuit (probably in conjunction with a breadboard and some wire. They usually have black plastic 'headers' that allow you to just plug a wire right into the board.

Reset Button: Just like the original Nintendo, the Arduino has a reset button (10). Pushing it will temporarily connect the reset pin to ground and restart any code that is loaded on the Arduino.

Power LED Indicator: Just beneath and to the right of the word "UNO" on your circuit board, there's a tiny LED next to the word 'ON' (11). This LED should light up whenever you plug your Arduino into a power source.

TX RX LEDs: TX is short for transmit, RX is short for receive. These markings appear quite a bit in electronics to indicate the pins responsible for serial communication.

Main IC: The black thing with all the metal legs is an IC, or Integrated Circuit (13). Think of it as the brains of our Arduino.

Voltage Regulator: The voltage regulator (14) is not actually something you can (or should) interact with on the Arduino

GSM: For providing communication between the GPS, GSM and the allocated mobile number GSM SIM900 module is preferred. The name SIM900 says that, it is a tri band work ranging a frequency of 900MHz to 1900 MHz such as EGSM900 MHz, PCS 1900 MHz and DSC 100

MHz Receiving pin of GSM module and transmitting pin of GPS module are used for communication between the modules and the mobile phone.

GPS: To find the location on the earth the whole is divided into some coordinates where the location can be easily captured by a module called GPS module. Here the GPS used is SIM28ML.

V. METHODOLOGY

Each day in the newspapers or in news the mankind read about thousands of people dying in road casualties not because of improper medical facilities or non- availability of efficient medications but just because the families of the people did not get timely informed. Isn't it sad? Those just because of delayed communication, a number of people are dying every day in the world. To overcome this delayed communication a number of accident detection, notification and vehicle

tracking systems have been developed in the recent years. Some of the systems proved to be of great use but still lack somewhere. This system aims to review some of these designed and proposed systems for Accident detection, notification and vehicle tracking. These systems if practically interfaced and implemented in vehicles can help saving lives and that too by informing the families of the people or preferred persons. In the recent years various vehicle tracking, accident detection and notification systems have been developed, these all systems are based on different technologies makes use different controllers and sensors to control the functioning of the system and sense the value of the parameter on which the functioning is based upon or uses different communication protocols to establish the communication. Over the years the technology has advanced and so have these systems. The strong demand for vehicles has resulted in greater traffic congestion and road accidents. Demand primary road accidents occur due to driver recklessness in cities, but accidents often occur outside f cities owing to intoxicated driving. Not only can driving while inebriated result in fatalities, but so does driving while not wearing a seat belt. As a result, the public's life is in grave danger. The reason for this is that our country lacks the greatest emergency facilities. This study introduces an automated alarm system that provides the most detailed information about the accident.
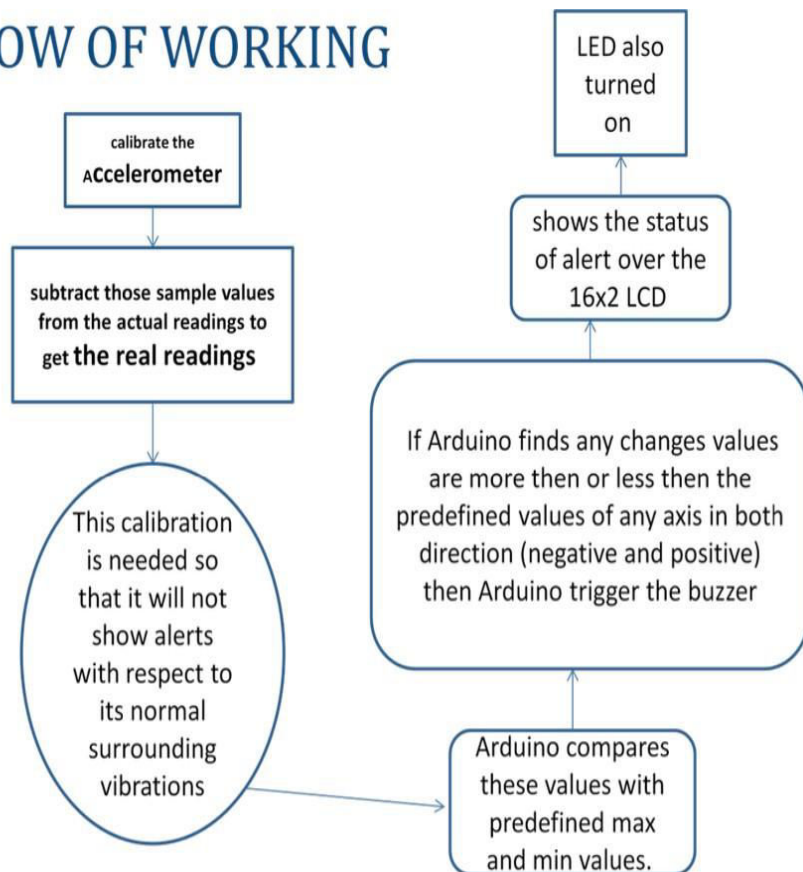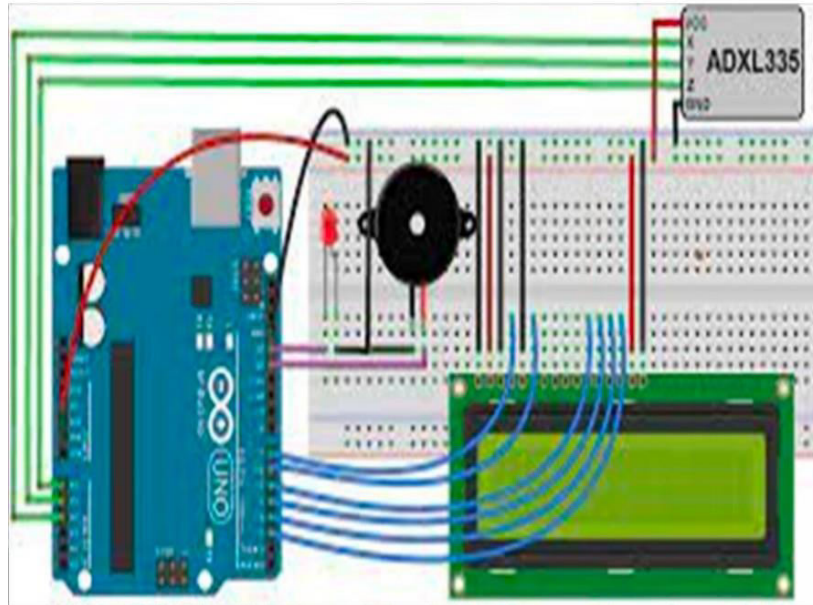

FIG.NO.2. SYSTEM ARCHITECTURE

CIRCUIT DIAGRAM
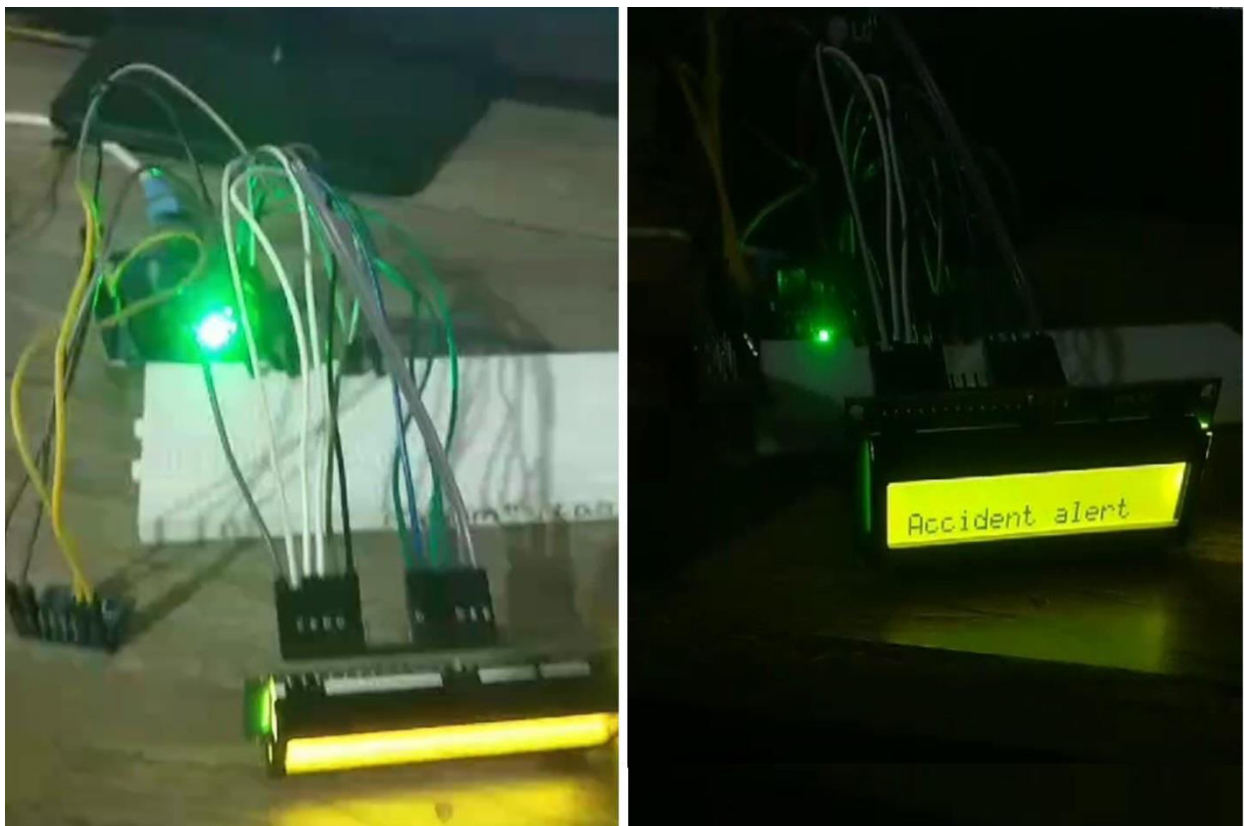

FIG.NO.3.CIRCUT DIAGRAM

FIG.NO.4.RESULT

VI. CONCLUSION

Accident detection and alert systems are a valuable technology for preventing accidents and improving response time in the event of an accident. A system to detect an event of accident has been developed. The proposed system deals with accident alerting and detection. It reads the exact latitude and longitude of the vehicle involved in the accident an sends this information to nearest emergency service provider. Arduino helps in transferring the message to different devices in the system. Accelerometer monitors the accident happening direction and gyroscope is used to determine rollover of the vehicle. The information is transferred to the registered number through GSM module.

VII. FUTURE SCOPE

The future scope of this system can have some improvisation using a wireless webcam can be added in this for capturing the images which will help in providing driver`s assistance. This can also be bettered by locking all the brakes automatically in case of accident. Mostly in accidents, it becomes serious as the drivers lose control and fails to stop the vehicle. In such cases, the vibration sensor will be triggered because of the vibrations received and processed by the processor. The processor has to be linked to the devices which can lock the brakes when triggered. With this improvement, we can stop the vehicle and can weaken the impact of the accident. This system can also be utilized in fleet management, food services, traffic violation cases, rental vehicle services etc.

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