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Accident Detection and Alert System for Emergency Help Using IOT and Mobile Applications

Yede Abhishek Kailas[1], Vidhate Sanket Dattatraya[2], Mujawar Mujjammil Rajjak[3], Kshirsagar Shreyas Sunil[4], Prof Jadhav Shweta S[5]

Abstract: ***Every day, many people around the world lose their lives in road accidents. Most deaths occur due to lack of access to adequate medical care. Over 1.25 million people die in road accidents. The goal of this project is to find out where the vehicle is located and locate the vehicle by sending messages through a system located within the vehicle system. In most cases, you may not be able to locate the scene of the accident. I don't know where the accident happened. To avoid such situations, we project an accident detection warning system for emergency assistance using IOT and mobile applications. As soon as an accident is detected, our system will identify the appropriate coordinates and send them to nearby emergency services and the victim's family so that they can arrive as soon as possible.***

Keywords: Accident detection and alert, Medical Assistance, Internet of Things(IOT), Acceleration sensor, Global Positioning System(GPS), Android Application

I. INTRODUCTION

Transportation is very important in our daily life, but it can also lead to disasters and deaths. Traffic accidents are harmful. They consume 3% GDP of country. In addition, 20-50 million people are injured in road accidents. If current trends continue, by 2030 road traffic deaths will be the leading cause of death in the 17- to 30-year-old group, up from 9th in 2009 to 7th. Half of all traffic deaths are pedestrians, cyclists and motorcycles. As the number of cars increases, the number of traffic accidents also increases enormously, and accidents also cause traffic congestion. We have developed a system that uses cellular IOT and GPS to find and transmit the information we need.

Most accidents are caused by human negligence, such as:

Breackless driving, lack of proper infrastructure, etc. The immediate rescue process after an accident can be viewed as a balancing act between life and death. Any delay in the arrival of medical assistance can cost the victim's life. A study by Virtanen et al it has been shown that 4.6% of his accidental deaths could be prevented in Finland only if emergency services arrived at the scene of the accident at the right time. Efficient automatic accident detection through automatic notification of rescue services with information about the location of the accident is therefore a fundamental requirement to save valuable lives. Smartphones have become such an important part of our lives that we can use them in our systems to prevent accidental deaths. Our application uses the phone's GPS receiver to detect sudden changes in deceleration that occur during an accident. It also gets pressure changes from a pressure sensor and tilt changes from your smartphone's accelerometer. By recognizing these three situations as accident detection, this Android app will send the location of the accident to emergency assistance. The app also added a kill switch option, allowing the driver to send an alert her message without checking the collision detection status.

II. OBJECTIVE

We are implemented IOT based or Applications Base project for saving life of every Vitim face accidents

Goal of this article are as follows:

1) To Study the accident statics
2) To study current existing systems
3) To develop a system which over comes cons of existing system.
4) Reduce the fatality rate
5) To identify and eliminate irrelevant components present in existing system
6) Make an economical system for detection and alert system.
7) Construction of an efficient automated vehicle accident detection system using Android
8) Develop a framework for reducing false alarm of vehicle accident detection
9) Dispatch automatic emergency accident alert message to relative, nearest police station and hospital

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III. EXISISTING SYSTEM

We investigated many existing systems, most of which connected using Bluetooth. The main drawbacks of Bluetooth technology are high battery consumption and the need to connect the device every time the vehicle is started. Bluetooth has a very weak security system that poses threats. Bluetooth 4.0 promises speeds of up to 25Mbps, which is much slower than cellular 4G LTE, or up to 420Mbps. There is a possibility. Bluetooth is very slow and many cars have airbags but no safety notification system to prevent future accidents**.**

IV. PROPOSED SYSTEM

In our system we have install cellular 4G LTE technology which is fast and efficient as well. Additionally we In our system we have used shock detector which keep detecting shock when the shock is measure above the defined value then vehicles are located anywhere in the world using GPS technology. Broadcast the marked location and alert the nearest emergency services such as police stations, hospitals, ambulances and the person's family. The Android mobile application also informs us that all device components are already available for Android devices. So the application will detect an accident and send a notification and live location to your contact number of choice.

V. METHODOLOGY

The following technologies were used in our system

1) GPS(Global Positioning System) Sensor

Fig :- GPS Sensor

GPS is a space-based global navigation satellite system that provides reliable position information in all weather conditions on or near the earth, anytime, anywhere, when there is an unobstructed line of sight to four or more GPS satellites. GPS satellites broadcast signals from space that all GPS receivers use to calculate their 3D position (latitude, longitude, altitude) and the current time. Currently this system sends latitude and longitude. Using this information, the position can be calculated from the location of the closest GSM transmitter using the cellular network.

2) Shock Sensors

Fig :- Shock Sensor

A sensor that measures sudden physical impact. A variant of the vibration sensor and accelerometer. Impact sensors play an important role in letting the system know that an accident may have occurred.

3) Arduino

Fig :-arduino

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Arduino is an open source electronics platform based on easy-to-use hardware and software. An Arduino board can read input (light from a sensor, a finger on a button, or a Twitter message) and convert it to output to run a motor, light an LED, or post something online. increase.
Arduino code is C++. The Core Arduino Functions is a set of C++ classes and libraries that you can use. Created and compiled with the GNU gcc/g++ compile Arduino

4) Sim Module

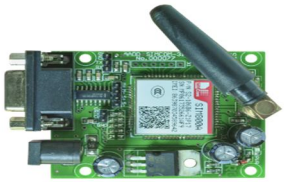

Fig . Sim Module

A SIM card must be connected to the module for full GPRS/GSM functionality. The Arduino SIM card provides easy, global cellular connectivity to your Arduino IoT Cloud project. Thanks to today's most popular GSM/4G networks, you can monitor devices around the world anytime, anywhere.

*5) 16*2 LED Display*

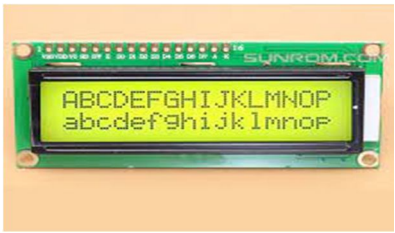

Fig LED Display

A 16x2 LCD can display 16 characters per line, meaning there are two such lines. This LCD displays each character in a 5x7 pixel matrix. The 16 x 2 intelligent alphanumeric dot-matrix display can display 224 different characters and symbols. Do not connect LEDs directly to the Arduino. The Arduino's GPIO pin supplies 5V in the HIGH state due to overvoltage, which determines whether its display message is successfully sent.

6) Piezo Buzzer

Fig Piezo Buzzer

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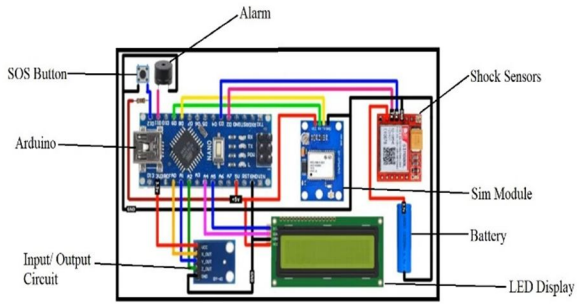
VI. SYSTEM ARCHITECTURE

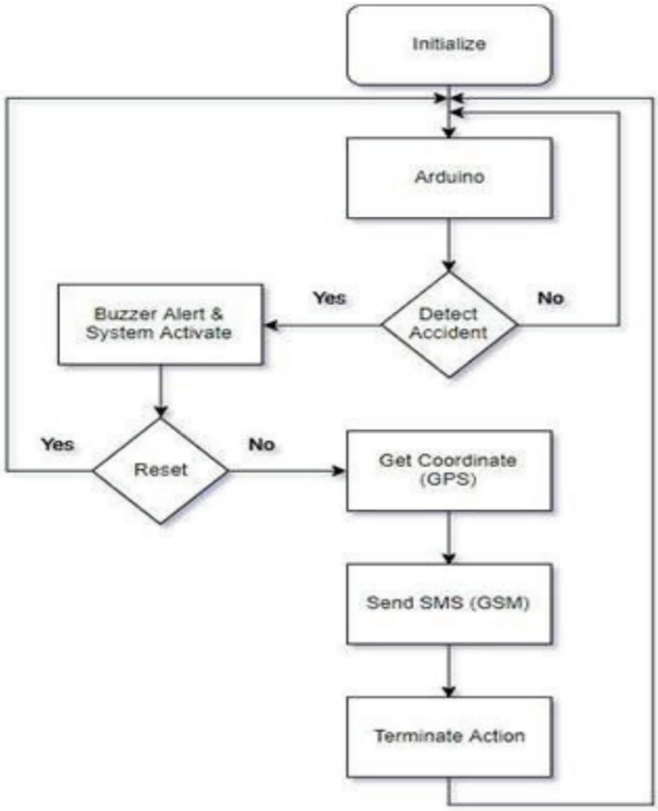


Accident Alert System

Fig :- System Architecture

Flowchart referring to various functions of the proposed system, as shown in Figure. The GPS receiver helps locate the coordinates of the vehicle. The determined coordinates are sent to emergency services via SMS via the GSM module. Accelerometers are used on each axis to detect accidents and sudden changes. Displays coordinates or status messages via a 16x2 LCD.

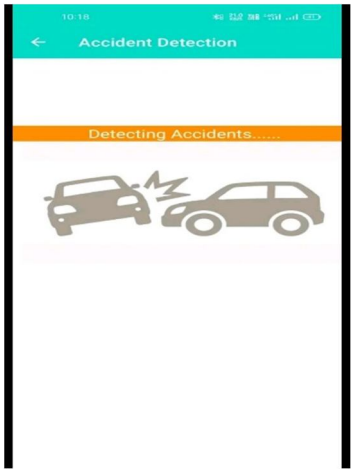
The Arduino then reads the changed values and compares them with the predefined values to identify any axis changes. As the axis values change, the Arduino reads the coordinates from her GPS module's records and he notifies the rescue team via SMS of the location of the accident. In this way, victims can be rescued by rescue teams in the shortest possible time and receive medical care.



VII. ANDROID APPLICATION

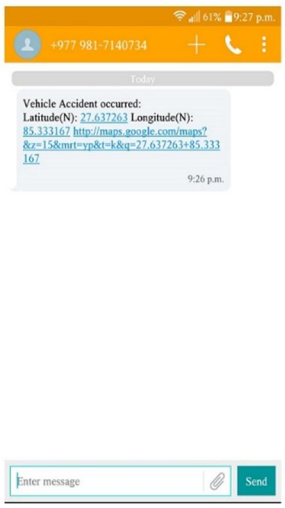
Many components come pre-installed on Android devices, so I didn't need to install them separately. Simply create an Android application using a powerful tool like Android Studio. Implement an android app at the same time as an accident happens while walking in the city. This application helps you send messages to contact numbers.

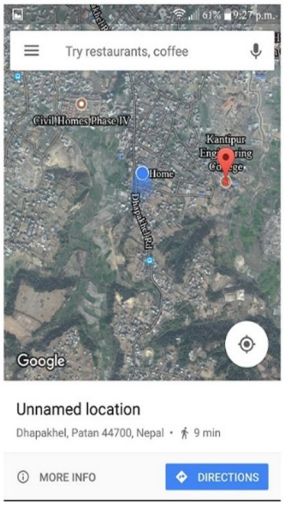
A. UI of Application



I need to add multiple contacts when an accident occurs. The application will then detect the incident and send a message and location to the contact number of your choice

B. Output





You clearly see that the output in LED display and android device

VIII. CONCLUSION

The proposed program deals with detecting incidents and warning paramedics to reach the specific location by taking them to the nearest hospital and providing the medical services to the person affected by the incident. This can be extended through providing the victim with medication at the spot of the accident. We can also avoid accidents by increasing the technology and using warning systems that could really stop the vehicle to conquer them.

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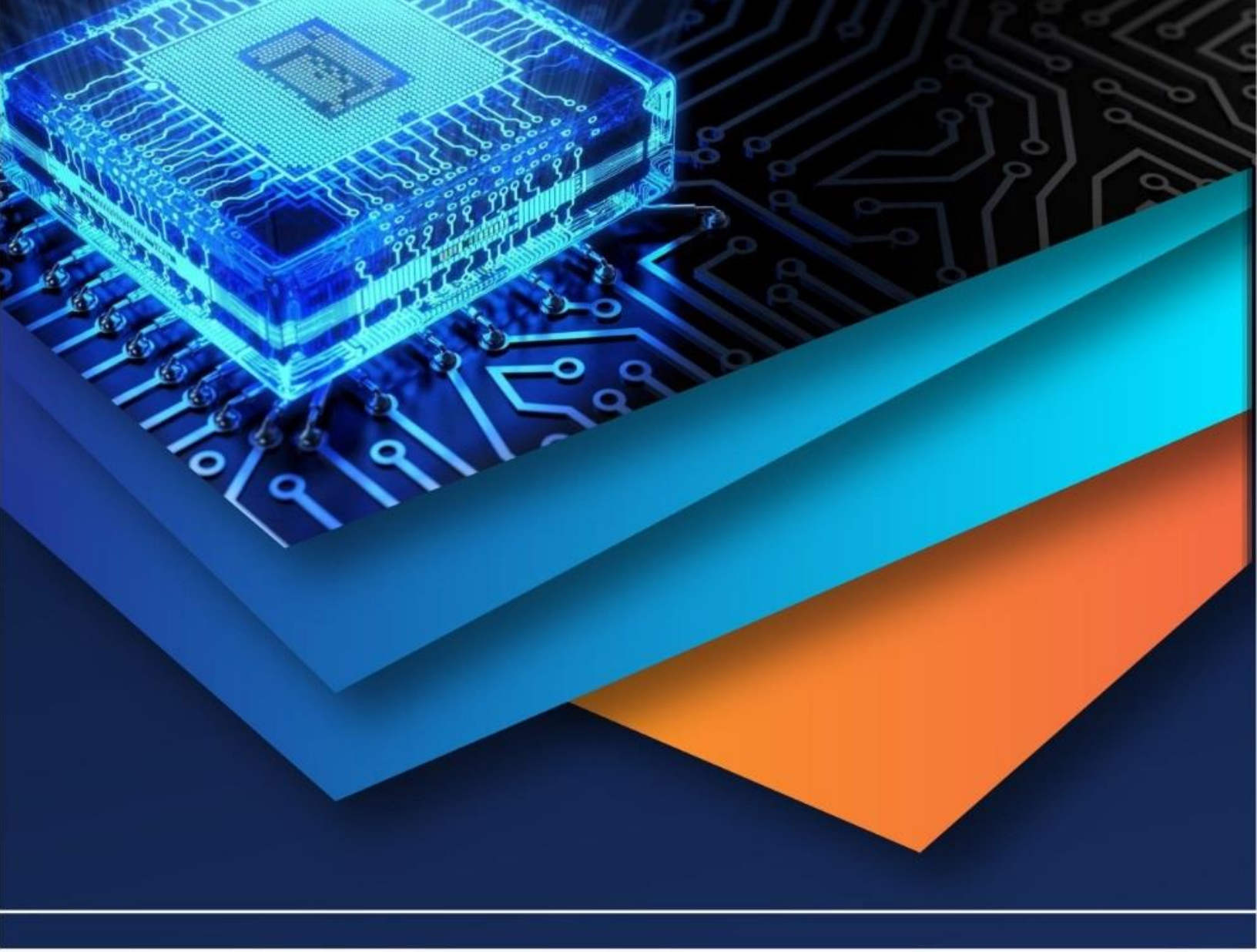

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