
AUTOMATIC VEHICLE ACCIDENT AND RUSH DRIVING ALERT SYSTEM

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ABSTRACT

A vehicle accident and rush driving alert system using nodemcu. it has a fully functional and independent circuit. it consists of mpu6050, ublox neo-6m GPS module with nodemcu. mpu6050 is a combination of an accelerometer and gyroscope. accelerometer records the acceleration across 3 axes, while the gyroscope records the rotational velocity across an axis. GPS module encodes data in NMEA format which helps to find out the exact location of misfortune. in addition, the mail is sent to a registered mail id through the IFTTT service.

the email conveys the message and sends the location of the accident to a user.

Keywords: IoT, Node MCU.

I. INTRODUCTION

Over the previous few years, the automotive industry worldwide has shown considerable progress in its production. The high demand for automobile increase traffics and hazard, road accidents. a lifetime of people is at the risk. to supply solutions and lack of emergency service available in-country this is often solution provided during this paper. This design can detect accidents in significantly less time and send information like date and time and place of hazard in latitude and longitude format. The message is transmitted via the IFTTT service, and also the location of the accident is identified using the GPS module. With the assistance of the /Accelerometer sensor, the accident is precisely detected. This application provides most feasibly the optimal solution to the poor emergency facilities provided for road accidents.

II. METHODOLOGY

Configure ESP8266

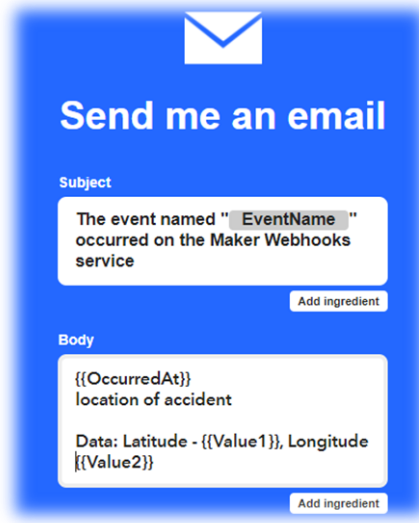
To configure ESP8266 first we install all the libraries. Like LCD, Tiny GPS, ESP8266wifi, esp8266clintserver.h, etc. Then we configure the ESP8266 to connect with WIFI. For that, we set SSID as our WIFI name and Password as Wi-Fi Password. Insert the IFTTT key for the generation of mail. For I2C communication with the sensor, we set SCL and SDA pins.

We set the setpoint of normal driving if the setpoint value is in the threshold value, then ESP sends a 'normal driving' to display. When the measuring value is over the threshold ESP sends 'high disturbance' and sends the mail to the owner. For the mail sent to the owner here, we use the IFTTT service (IF THIS THAN THAT) which allows us to trigger any action when required. For the trigger action we use webhook which receives the web request and to respond owner we use mail so whenever the actual value of the sensor is cross set value our esp8266 sends a web request to webhook and mail is sent to the owner.

IFTTT also gives a feature in which we can write a mail as per owner format whatever changes we want in the mail we can change the mail body in IFTTT and changes are applied. In IFTTT mail service we are using two float values for our latitude and longitude using that when an email is sent to the owner current GPS location is attached with the email so the owner will get a location where an accident occurs.

Configure IFTTT Service

IFTTT stands for If this then that means if this happens then that action has to be done. First, create an applet for launching webhooks. Webhooks receive web requests from NODE MCU. To get a result in mail format we select email. After this, an IFTTT key is generated which we can use in our program to send the web request.



Integration of ESP8266

ESP8266 is a vital component of the circuit that connects all the components. First, we enable SSID and Password so it can connect with the internet then select data pins for LCD output and set SDA and SCL for MPU6050.

Integration of GPS module

In the first phase, the GPS module is tested independently with each pin. Later on, all the module pins are integrated with the ESP8266. Each GPS module has some input and output port for serial communication. GPS Module Tx pin is connected with the Rx pin of ESP 8266 and GPS Module Rx is connected with the Tx pin of the ESP 8266. GPS module power supply VCC and GND are connected to 3V3 and GND of ESP8266 Respectively.

Integration of Accelerometer AND Gyroscope (MPU6050)

An accelerometer is a component that is used to initiate the circuit. The accelerometer gives us x, y, and z-direction coordinates values in Hz. If on the detection of any jerk, i.e. accident, and so the movement of the vehicle is kind of the defined value within the code, then it'll set the condition to true, and also the code is written for initiating the intimation and SMS alert gets executed.

Wiring Diagram

In wiring, we kept some points in mind. The circuit should be small so it can attach to any vehicle circuit should have water resistance and moisture resistance to perform better in any environment.

- Nodemcu to GPS wiring: - Connect the Neo 6m GPS module on to Nodemcu board by connecting the GND pin of neo 6m to the GND pin of Nodemcu and the VCC pin to the 3v3 pin. Also, connect RX to TX and TX to RX.

Node MCU	Gps module
3v3	Vcc
Gnd	Gnd
Tx	Rx
Rx	Tx

- Nodemcu to mpu6050 wiring: - connect the mpu6050 directly to the Nodemcu board by connecting GND to GND of esp's. than VCC to 3v3 of esp and SCA and SDA pin in D1 and D2 of the esp.

Node mcu	Mpu6050
3v3	Vcc
Gnd	GND
D1	SCA
D2	SDA

- Nodemcu to LCD wiring: - to connect the LCD with node MCU the following table as under

Lcd 16*2	Node MCU
Vdd	5v
Vss	GND
Vo	POTENTIOMETER OUTPUT
Rs	D0
E	D3
D4	D4
D5	D5
D6	D6
D7	D7
A	5V WITH 220OHM RESISTOR
K	GND

III. MODELING AND ANALYSIS

NodeMCU

NodeMCU is configured to figure on the Arduino IDE as an open-source firmware platform. There are open-source prototyping board designs available. It can be both a standalone microcontroller and also as a node during an IoT ecosystem. The module used here is an ESP-8266 NodeMCU module.

Email Alert and IFTTT

IFTTT is a free web-based service, that allows users to create applets with simple conditional statements. It generally allows the user to create the applet using the if statement (If this happens, then do an action). The event is usually triggered by an API call. The API call contains the API key, hostname, port, event name, and so the values to be passed. For this project, the user has got to create an applet that is able to send a mail to the owner of the vehicle with its GPS location attached.

NEO 6M GPS MODULE

This article demonstrates a way to play with the u-blox NEO-6M global positioning system (GPS) module, very popular, cost effective, high-performance GPS module with a ceramic patch antenna, an on-board chip, and a backup battery that may be conveniently integrated with a broad range of microcontrollers.

10K Potentiometer

Variable 10K pot is employed to adjust the brightness of the LCD Display and providing the facility to the LCD as per the.

16x2 LCD Display

Integration of 16x2 LCD Display The functioning of the circuit is displayed using the 16x2 LCD display we've got shown all the functions output on the LCD Screen in Table 1. The connection of LCD pins is given within the circuit diagram.

IV. RESULTS AND DISCUSSION

The prototype of the IoT based Automatic Vehicle accident and rush driving alert system was tested and all the various parts were found to be functional.

1. Gyroscope continuously measures X, Y, and Z axis data and display it.
2. If an accident occurs then an email is sanded to the user's email address.

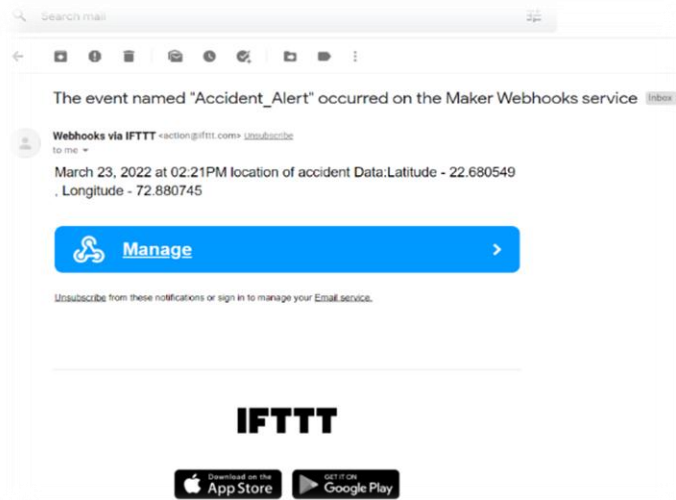


Fig: Mail received from IFTTT



Fig: Hardware implementation.

V. CONCLUSION

This project presents a vehicle accident detection and alert system with an email to the user-defined Email Address. The GPS tracking and GSM alert-based algorithm is meant and implemented with NODE MCU in the embedded system domain. The proposed vehicle accident detection system can track geographical information automatically and sends an alert email regarding the accident. The result shows that higher sensitivity and accuracy are indeed achieved using this project IFTTT is interfaced to store the email address permanently. This made the project more user-friendly and reliable. The proposed method is verified to be highly beneficial for the automotive industry.

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