

# Fruition Adroit Systematic Transport (F.A.S.T)

S. J. Patil<sup>1</sup>, Ninad Vashta<sup>2\*</sup>, Pravin Shinde<sup>3</sup>, Abhishek Lole<sup>4</sup>, Akshaykumar Teli<sup>5</sup>

<sup>1,2,3,4,5</sup>Department of Electronics Engineering, DKTE'S Textile & Engineering Institute, Ichalkaranji, India

**Abstract:** Transportation one we can say as the backbone of any type of business or other social as well as day to day service in our life. One of the leading and growing industry that is transport which has day to day new opportunities as well as growing competition in the market. Basically our project is to ensure the safety measurements of the vehicle as well as its owner. To achieve this goal, me and my team is working on some innovative ideas which can help in this process. The Smart Transportation System or we can say FAST.

**Keywords:** Arduino Uno, GPS+GSM module, Accelerometer Gyroscope, Buzzer, Ultrasonic sensor.

## 1. Introduction

Analysing the market in automobile sector we observe that there are many devices in the market now related to your vehicles one of them is the anti-theft system but the problem is it is not available in each and every variant of the cars or other vehicles, so our aim is to build the system which is simple in use, cost efficient and gives better output in every condition. Along with some upgrades in single system.

## 2. System Description

This system is divided in two parts first one is hardware part which contains all the sensors and material and the second part which is software and cloud computing. In Hardware part the basic information is collected by the sensors which helps the driver while driving the vehicle this system we named it as a Black-Box system which contain all the information. And the second part is IoT based cloud computing by which all this data like live location of the vehicle, temperature of the system and SOS messaging can be possible

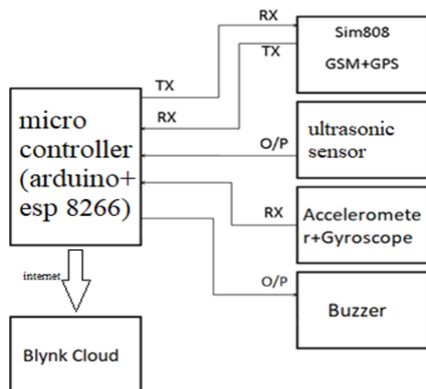


Fig. 1. Block diagram

### A. Problem Statement

To design a system which gives the exact location of the device or to track it live with respect to its location. And observe the movements of the device and if suspect any suspicious activity or need any kind of help then making a call without wasting any time.

### B. Objective

- 1) Design a system which is affordable to everyone and extremely accurate.
- 2) Interfacing with IOT and Cloud to obtain data.
- 3) To make a user-friendly interface for android as well as for iOS users.

### C. The Black-Box Overview

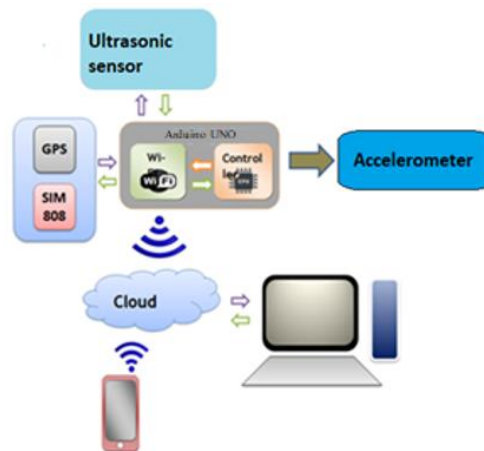


Fig. 2. Model of system

This box system includes Arduino Sim808, Accelerometer and gyroscope module and buzzer. Arduino and esp we can say as the backbone of this project along with Sim 808 as the head instrument. Ultrasonic are interfaced with the controller as Accidental prevention device. The MPU6050 which is Accelerometer + Gyroscope gives the angular position of the device as well as the temperature of the system.

When the supply is given to the circuit the SIM808 which is GPS+GSM module starts and goes in the locking position. Sim 808 acts as GPS which gives us the exact location of the registered device through messaging in latitude and longitudinal co-ordinates. This process of sending the text messages is carried out with the help of GSM. The ultrasonic is simply acts as Accident prevention system it measures the

\*Corresponding author: ninadvashta@gmail.com

distance between two cars and if the distance is less than specific gap then it triggers the alarm with the help of the buzzer. The MPU6050 used is to monitor the temperature as well as the critical angle of the system.

### 3. Components

#### A. Arduino Uno



Fig. 3. Arduino Uno

The Arduino Uno is an open-source microcontroller board based on the Microchip ATmega328P microcontroller and developed by Arduino.cc. It has 14 digital I/O pins (six capable of PWM output), 6 analog I/O pins which are programmable using Arduino IDE.

#### B. SIM808



Fig. 4. Servo Motor

SIM808 module is a GSM and GPS two-in-one function module. It is based on the latest GSM/GPS module SIM808 from SIMCOM, supports GSM/GPRS Quad-Band network and combines GPS technology for satellite navigation. The module is controlled by AT command via UART and supports 3.3V and 5V logical level. As it supports the real time clock one can get the exact coordinate system as well as it supports the GPS NEMA protocol. Also SIM808 works on supply of 2amps constant as well as it has charging control for Li-Ion battery, with an Integrated GPS/CNSS.

#### C. MPU 6050



Fig. 5. MPU6050

The MPU-6050 device combines a 3-axis gyroscope and a 3-axis accelerometer on the same silicon die together with an on-board Digital Motion Processor (DMP) capable of processing complex 9-axis Motion Fusion algorithms. The parts' integrated 9-axis Motion Fusion algorithms access external magnetometers or other sensors through an auxiliary master I2C bus, allowing the devices to gather a full set of sensor data without intervention from the system processor. Also this module has on-board Integrated Digital Motion Processor (DMP)

#### D. Ultrasonic



Fig. 6. Ultrasonic Sensor

Ultrasonic sensor module can detect existence of an object by sending ultrasound signals and monitoring its reflection. It's one of the most common techniques to detect an obstacle in front of a robot. Another known usage is to measure the distance from an object.

Working voltage: 3 - 5V DC

- Detection distance: 2 ~ 450cm
- Output type: Digital Output
- Board size: 45mm x 20mm x 15mm

#### E. Buzzer



Fig. 7. Buzzer

A buzzer or beeper is an audio signalling device, which may be mechanical, electromechanical, or piezoelectric. Typical uses of buzzers and beepers include alarm devices, timers, and confirmation of user input such as a mouse click or keystroke.

#### F. ESP 8266

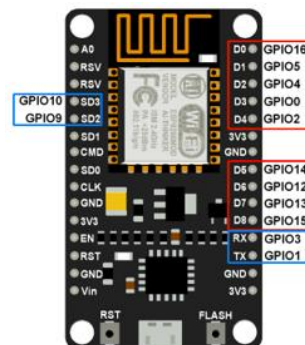


Fig. 7. ESP 8266

NodeMCU is an open source IoT platform. Which includes firmware which runs on the ESP8266 Wi-Fi Module from Espressif Systems, and hardware which is based on the ESP-12 module? The ESP8266 is a low-cost Wi-Fi chip with full TCP/IP stack and microcontroller capability produced by Shanghai-based Chinese manufacturer, Espressif.

#### 4. Working

The working of the system is based on the simple logic of satellite tracking with the help of SIM808 which is GPS+GSM system. When the system is turned at initial in the gps goes in to the locking state, whenever the system is gets registered on the network is gives the message that system is turned on and at the output, we get the values in the form of latitude and longitudinal coordinates.

The Accidental prevention system we designed with the help of ultrasonic. The system is work on the principle of sonar. Ultrasonic emits the ultrasonic sound at a specific angle and if an obstacle or car is detected then it triggers the alarm.

The MPU6050 is a 3-axis Gyroscope and 3-axis Accelerometer which gives the physical as well as angular outputs so we use this system as a key part in accident alert system if the device is tilt more than a specific angle then it generates the message for help to your registered device number

#### A. Flowchart

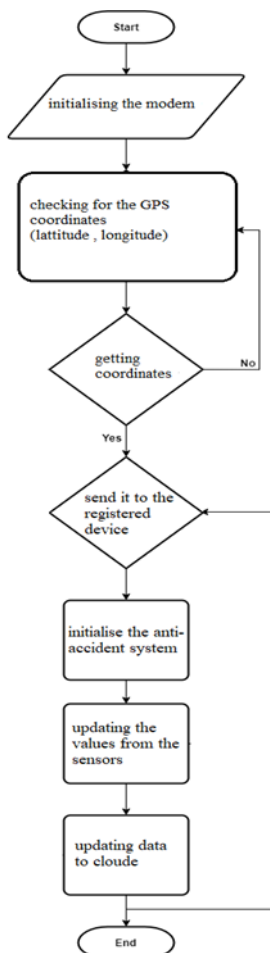


Fig. 8. Flowchart

#### B. Steps of Operation

- Initializing the system
- GPS check and locking state for the co-ordinate system
- Generating the text for latitude and longitudinal co-ordinates.
- Generating the map link for the location
- Ultrasonic sensor checking the distance for the accidental prevention system.
- If vehicle is detected triggers the alarm.
- MPU6050 checks for the angular or tilting values also monitors the system temperature.
- If system is tilted than a specified angle then generates the message for help.

#### 5. Advantages

- Using this system, we can monitor each and every device on the map which is registered
- This system reduces the time taken by the medical teams to reach at an accidental site
- It can notify the person who is driving vehicle each and every time if some other vehicle is passing by nearby.
- With some proper calculations and modification this system is applicable in each and every variant of automobiles.

#### 6. Results

From this system we collect the data and by analysing it we can say that,

- The system works fine and at exact precision in open areas.
- Our idea is to spread this network globally so for the health teams and rescue teams can approach the casualty spots in less time.
- The complete system takes time to boost in 10 seconds as the GPS takes some time to get in locking state.
- It is easy to monitor the suspicious acts by siting in one place.

#### 7. Conclusion

Making the conclusion statement we can say that this system is designed for automobile sector is more reliable for monitoring the devices as well as to send the help if needed. This system is specially designed to control or to reduce the accidental cases which are happened due to awareness or over speeding or any other reason. We can't say that it will give the 100% result but we definitely can say that it will help to reduce the casualties as well as cases like thefts.

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