

# **J.C. BOSE UNIVERSITY OF SCIENCE AND TECHNOLOGY, YMCA, FARIDABAD**



## **Vehicle Insurance Invalidator**

**Name: Raghav Gupta , Rajnish Singh**

**Course: B.tech**

**Class: Electronics Engineering (IOT)**

**Roll no: 21001017047 , 21001017049**

**Semester: 5**

# Vehicle Insurance Invalidator

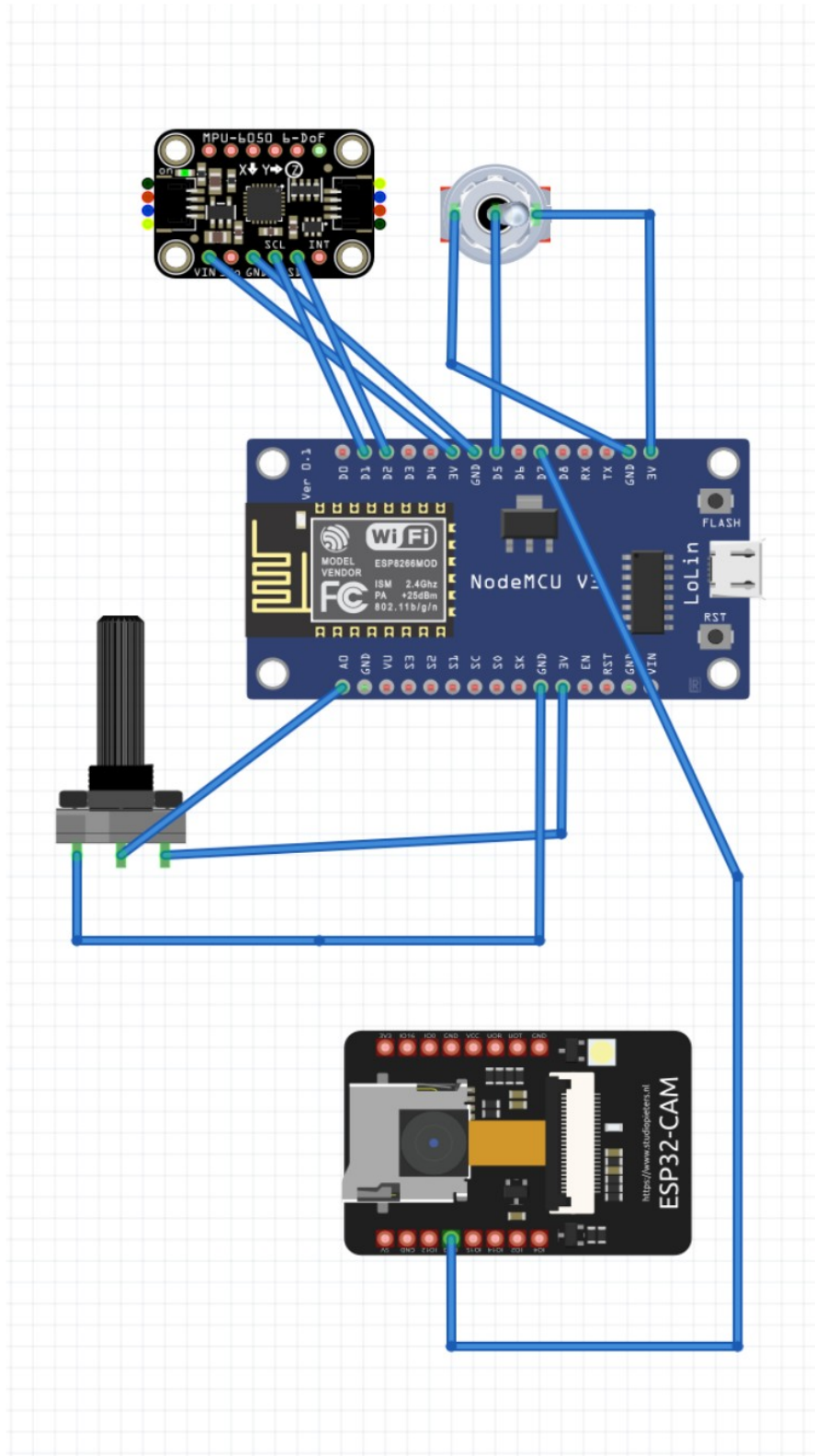
## Introduction

- The Device is used to void life/vehicle insurance claim in case of reckless endangerment by the driver of the vehicle.
- The device is aimed at monitoring vehicle driver's driving behaviour on several parameters.
- The data accumulated by the device is sent onto the insurance agency's server where it is further analysed by the agency to create a behavioural profile of the driver.
- On the basis of a driver's profile, the agency may increase the premium of the insurance or may reject a insurance claim.
- The device is inspired by Tesla Insurance model.
- The device aims at working and being installed inside the dashboard of the car.

# Principle & Working

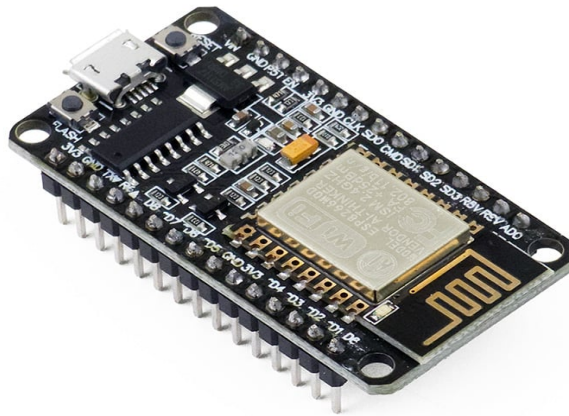
- The device uses an ESP 32 cam module to capture images and log them at a folder on the cloud. An ESP 8266 Nodemcu module is used to control the sensors and send signals to the cam module.
- The device monitors three things via the ESP 8266 module:
  - i. Accelarometer (MPU 6050)
  - ii. Seat belt flag
  - iii. Speed of the vehicle
- The device is to be installed on the dashboard of the car with the camera facing the driver.
- When the driver drives the car without seatbelt and above the threshold speed, an image of the driver will be sent to the cloud after every 15 minutes which will account for the driver's driving behaviour.
- Also in an an event of a crash of the car, an image will be sent on the cloud which will further testify the reckless driving of the car. The threshold for detection of the crash will be set in the node mcu.
- The accelarometer will be placed in such a posion at the car so that it can detect a valid crash of the vehicle.
- The images in the cloud are manages via a Google app script which makes the integration very easy.
- The data for seat belt is taken from the dashboard itself. Also the car battery is used to power the device.

# Circuit diagram



## Components used

- ESP 8266 Node Mcu:



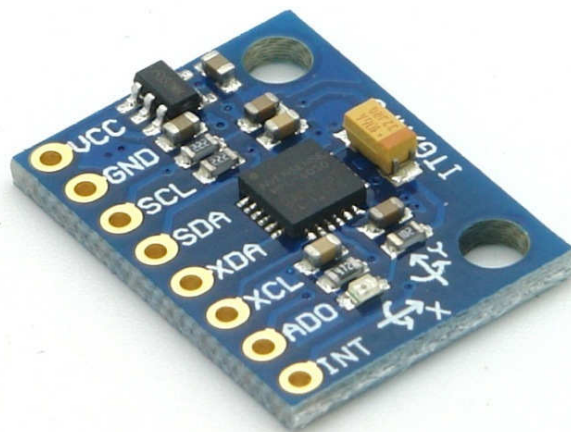
NodeMCU is an open-source firmware and development kit that helps you to prototype or build IoT products. It includes firmware that runs on the ESP8266 Wi-Fi SoC from Espressif Systems, and hardware which is based on the ESP-12 module. The firmware uses the Lua scripting language. It is based on the eLua project and built on the Espressif Non-OS SDK for ESP8266.

- ESP 32 camera module:



ESP32-CAM is a low-cost ESP32-based development board with onboard camera, small in size. It is an ideal solution for IoT application, prototypes constructions and DIY projects. The board integrates WiFi, traditional Bluetooth and low power BLE , with 2 highperformance 32-bit LX6 CPUs. It adopts 7-stage pipeline architecture, on-chip sensor, Hall sensor, temperature sensor and so on, and its main frequency adjustment ranges from 80MHz to 240MHz. Fully compliant with WiFi 802.11b/g/n/e/i and Bluetooth 4.2 standards, it can be used as a master mode to build an independent network controller, or as a slave to other host MCUs to add networking capabilities to existing devices ESP32-CAM can be widely used in various IoT applications.

- MPU 6050



MPU6050 sensor module is complete 6-axis Motion Tracking Device. It combines 3-axis Gyroscope, 3-axis Accelerometer and Digital Motion Processor all in small package. Also, it has additional feature of on-chip Temperature sensor. It has I2C bus interface to communicate with the microcontrollers.

It has Auxiliary I2C bus to communicate with other sensor devices like 3-axis Magnetometer, Pressure sensor etc.

If 3-axis Magnetometer is connected to auxiliary I2C bus, then MPU6050 can provide complete 9-axis Motion Fusion output.

## Estimated Cost

Component	Quantity	Cost
ESP 8266	1	300/-
ESP 32 cam	1	600/-
MPU 6050	1	300/-
	Total	900/-

# Applications

- The device aims at reducing loss of insurance companies due to negligence of the driver.
- The device will make it time efficient for insurance firm to monitor a driver's driving behaviour.
- The device will act as a reliable source of information for the insurance firm to act upon. The images itself are a valid proof in case of reckless driving.
- The device will also help in keeping the behaviour of the driver in check to cultivate good driving vehicle.