

Alcohol Sensing with Heart Beat Monitoring in Transportation System Using IOT

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ABSTRACT

In our day-to-day life while driving the vehicles, Driver's must follow the rules like buckle up seat belt, cannot able to drink and drive. The smart vehicle system using IOT and sensors like Heartbeat and Alcohol sensor to prevent the person travelling in the vehicle from accident, "Prevention is better than cure" proverb which makes our life safe and secured. Government asked drivers to follow the Traffic rules, but drivers refused to follow road rules like buckle up seatbelt, don't drink and drive vehicle, stop in red signal. By implementation, the proposed system describes the modern world that surely there will be reduction in accident. When person trying to start vehicle, alcohol sensor continuously identifies the alcohol level if it will exceed the threshold value vehicle will stops automatically. Heartbeat sensor monitor the heartbeat rate of a driver continuously only after driver gets into the car, so heartbeat sensor monitors heartbeat rate and send message to microcontroller. After receiving message from heartbeat sensor, microcontroller executes necessary action whether allow driver to start or not. The LED and Buzzer are used to user to know the status.

Keywords: IOT, Heartbeat(pulse) sensor, Alcohol Sensor, LED and Buzzer.

INTRODUCTION

An accident said to be any vehicle accident is occurring on a highway. These accidents are collision between vehicles and animals, vehicles and fixed obstacles and not proper road conditions. The world health organization says 1.25million people die each year as a result of road accidents. The main causes of road accidents are drunk and drive condition. Alcohol reduces the concentration of the rider and prevents the rider's vision due to the giddiness. Alcohol obscure fear and actuate the

riders to take risks. There are laws to check wear helmet, seat belt and drunk and drive but there is no successful. The motor cycle act, 1939 has a clause which states that liable for punishment at first offense for imprisonment for a term of 6months or Rs. 2000/- fine. This law is very successful, but it is failed usually due to the in charge officers are bribed. The drunk and drive is equally to a murder and he cannot out his own tasks and risks danger. These two are the main reasons which motivate us to build smart transportation system in which the first step is detection of alcohol detection and drivers heart condition when both conditions are satisfy then only the engine ignition will start. Pulse sensor and alcohol sensor are used.

System model:

In Arduino using more applications in real time applications.

Arduino uno:

Arduino uno is an open source platform used to construct embedded projects. Arduino uno is very simple for both hardware and software. It consists of both a physical programmable and circuit board. Arduino platform is turn into a decamp popular with people aloof started out with electronics for better result. The arduino do not need a isolated bit of hardware in order to bundle new code on to a board. Here we use a USB cable. The IDE of arduino uses a simplified version of c++. The program is simple to learn. Finally the functions of microcontroller is braked by the microcontroller. Uno is for the most leading boards in the arduino family group and considerable elect for beginners.



Figure1: Arduino uno

Pulse sensor:

The pulse sensor we are going to use is a plug and play heart rate sensor. This sensor is quite easy to use and operate. Place your finger on top of the sensor and it will sense the heartbeat by measuring the change in light from the expansion of capillary blood vessels. When a heartbeat occurs blood is pumped through the human body and gets squeezed into the capillary tissues. The volume of these capillary tissues increases as a result of the heartbeat. But in between the heartbeats (the time between two consecutive heartbeats,) this volume inside capillary tissues decreases. This change in volume between the heartbeats affects the amount of light that will transmit through these tissues. This change is very small but we can measure it with the help of Arduino.



Figure 2: Pulse Sensor.

Alcohol sensor:

An alcohol sensor is used for checking the concentration of alcohol in sample. It is similar to a common Breathalyzer. It has higher sensitivity and faster response time. Sensitivity produces an analog resistive output based on alcohol concentration. The sensitive material used for manufacturing of this sensor is SnO_2 , whose conductivity is low in clean and neat air. The conductivity increases as the concentration of alcohol gas increases. These sensors modules put up easily interacted with microcontrollers, arduino

boards, raspberry pi etc.



Figure 3: Alcohol sensor

DC motor:

Dc motor or engine is used to convert the electrical energy into mechanical energy in the form of rotation. Dc motor is one of the primitive motor designs. A dc motor hope on the fact that like or similar magnet poles repels and unlike or opposite magnetic poles attract each other. The dc motor design is simple to understand and controlling the speed of a brushed dc motor is also easy. The dc motor is designed to curb the magnetic interaction between a current carrying conductor and an external magnetic field to generate rotational motion.



Figure 4: DC Motor

PROPOSED SYSTEM:

Heartbeat sensor and alcohol sensor will be attached in steering of the car. Once the driver starts the vehicle and wears the seat belt, this sensor automatically monitors the heartbeat rate and alcohol limit consumed by the driver through Internet of Things. When the heartbeat rate goes abnormal (i.e., above the reference value), IOT notifies the emergency monitoring information to the owner of the car to prevent from accident and save the driver's life. Main concept is if the person was in our stable (alcohol consumed) state and heart beat rate was normal then only engine is

allowed to start this makes drivers compulsory to drive car. This is done by small concept that is the message will be sent from heartbeat and alcohol sensor which is fixed in the steering then only the microcontroller allows or permit the driver to start engine.

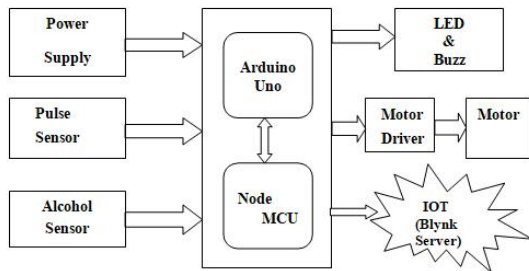


Figure 5: Block diagram.

EXPERIMENTAL RESULT:

The below figure shows the experimental set up of our project. The adaptor is connected to the board and then after switch on the power supply. Both the sensors operate on positive logic means they will be in low state before they sense. They will be low when they sense. When the sensors sense then automatically the engine will be OFF and a message is passed to their well-wishers because of IOT.

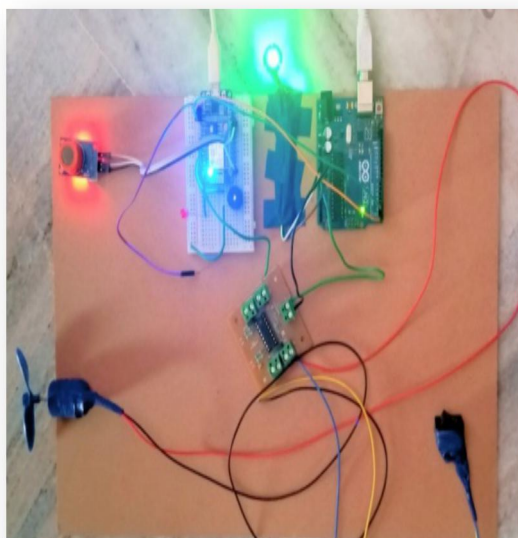


Figure 6: Working process for alcohol sensing and heartbeat monitoring in transportation system

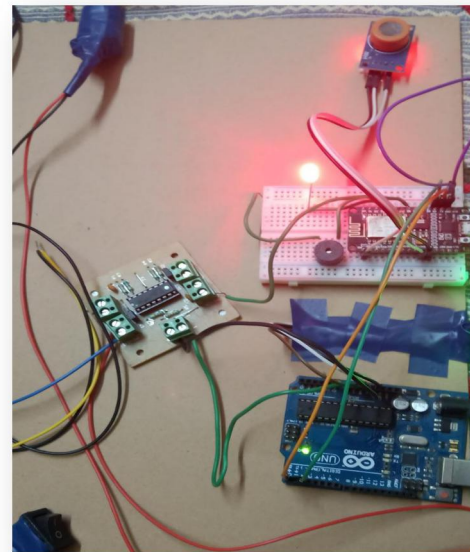


Figure 7: LED and Buzzer are beeping when driver is with high alcohol or heartbeat is abnormal.

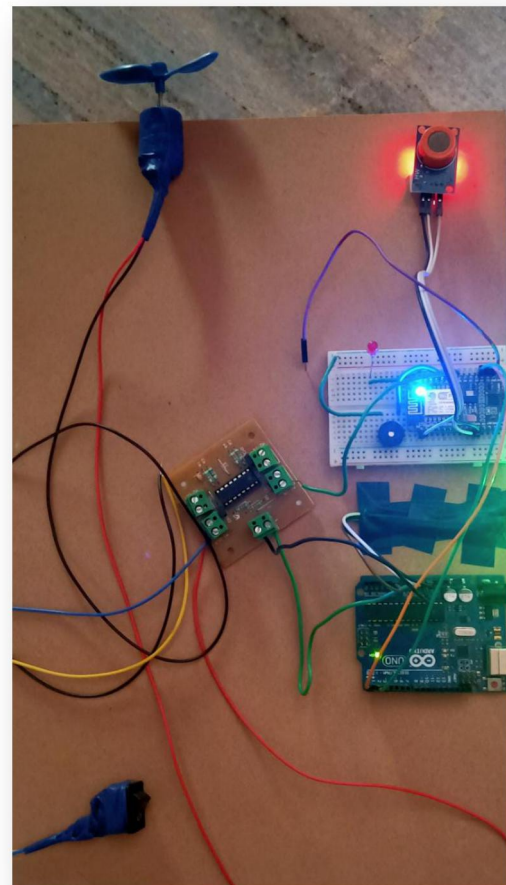
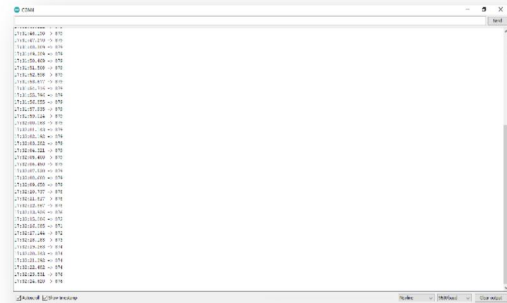
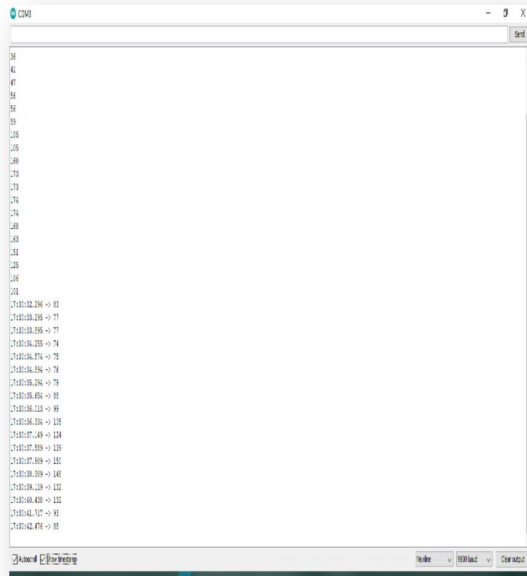


Figure 8: when driver is with low alcohol or heartbeat is normal.

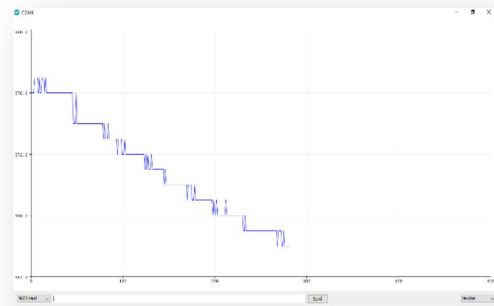
heartbeat is normal, the led is off and buzzer do not beeps

RESULTS ON SERIAL MONITOR:

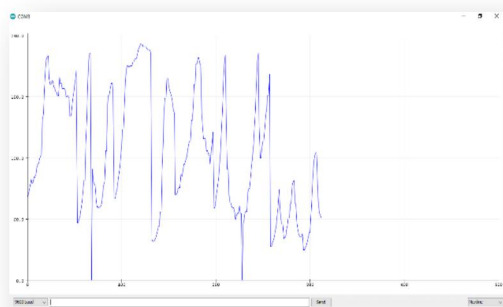
The below figure represents the output that is the pulse rate of the person in the serial monitor of Arduino IDE.



The below figure represents the output that is the alcohol level in terms of graph(Serial plotter) in Arduino IDE.

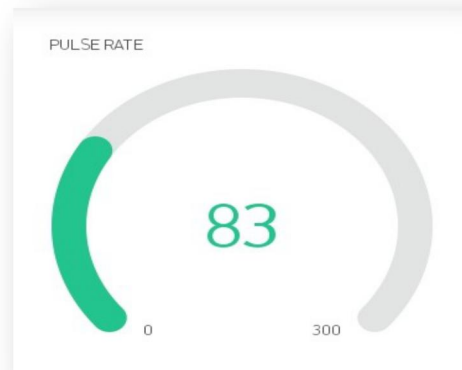


The below figure represents the output that is the pulse rate in terms of graph(Serial plotter) in Arduino IDE.



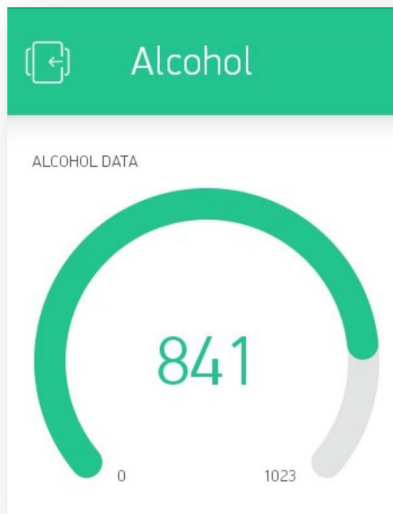
RESULTS ON BLYNK APP:

The below figure represents the output that is been displayed on the mobile Screen in the blynk app, The Pulse rate is normal



The below figure represents the output that is the alcohol level of the person in the serial monitor of Arduino IDE.

The below figure represents the output that is been displayed on the mobile Screen in the blynk app, when alcohol level is normal



The below figure represents the output that is been displayed on the mobile Screen in the blynk app, when the heartbeat and alcohol level is abnormal.



CONCLUSION:

We have proposed a system that deals with the accident prevention and monitoring safety driving in a transportation system. The alcohol sensor will measure the level of alcohol constantly and send to microcontroller, which check whether the driver drunk alcohol or not. If the microcontroller detected the alcohol drunken by driver then it will send monitoring information to owner. Heartbeat sensor which will constantly detect the heartbeat rate of driver. If the heartbeat rate goes to abnormal rate then the monitoring information will be sent to owner through IOT. On seeing the driver's condition on his mobile the owner can inform to

nearby police and even for ambulance. With these two sensors the driver's health condition can monitored through internet and by this we can save a person's valuable life.

Main concept is if the person was in our stable (alcohol consumed) state and heart beat rate was normal then only engine is allowed to start this makes drivers compulsory to drive car. This is done by small concept that, the message will be sent from heartbeat and alcohol sensor which is fixed in the steering then only the microcontroller allows or permit the driver to start engine.

FUTURE SCOPE:

We can implement various Bio-electric sensors on the drivers cabin to measure various activities like a vibration sensor for accident detection. By using GSM and GPS modules we can access the current location of the drivers.

Vibration sensor will be activated when the accident occurs and the information is transferred to the registered number through GSM module. Using GPS, the location can be sent through tracking system to cover the geographical coordinates over the area. The accident can be detected by a vibration sensor which is used as major module in the system. The integrated drunk and drive detection system detects solely the drivers state. It could even be extended by incorporating an extra alcohol odour sensor at the traveler seats to discover the presence of alcohol within the air within the vehicle cabin.

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