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DESIGN OF SMART SHAKO USING WIRELESS SENSOR AND GSM TECHNOLOGY

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Abstract - *With the increasing number of two-wheeler vehicles, frequency of accident is on rise. Major causes for calamity one either the rider not wearing a helmet, or he has consumed alcohol and the setback is not reported on time. Currently there are no technological interventions being used to prevent such events. This paper proposed a smart helmet system. This is implemented using advance features like alcohol detection, setback identification, location tracking and fall detection. This will help in avoiding such situations to a significant extent. The smart helmet has a module to defect whether the rider is wearing the helmet and also analyses the breath of the rider to check for consumption of alcohol. The rider will not be able to start the vehicle if the rider is drunk and is not wearing helmet. Instead of calamity occurred then the location of calamity is tracked and sends the alert message to the ambulance with the location of calamity. This system will provide safety to bike rider all time.*

Key Words*: *smart helmet, vibration sensor, ultrasonic sensor, GSM Module, MQ5 sensor.

1.INTRODUCTION

India ranks 1st in the number of road accident deaths across the 199countries reported in the world as per the WHO Global report on road safty2018,india accounts for almost 11% of the accidents occur.1214 road crashes occur every day in India. Two wheelers account for 25% of total road crash deaths. 20 children under the age of **14** die every day due to road crashe**s** in in the country. 377 people die every day, equivalent to a jumbo jet crashing every day. Road accidents are increasing day by day because the riders are not wearing the helmet and due to consumption of alcohol. In today's world, huge numbers of people are dying on road accidents. Smart helmet helps to curb "riding without helmet "by ensuring that the rider mandatorily wears the helmet while driving. Thus the objective of this project is to make sure people wear helmets and then ride bikes. Another objective is to make sure the rider isn't drunk. The rider won't be able to ride the bike if he is drunk. One more objective is to reduce the fatality of the accidents by sending a message to the riders' relative about the accident. This was further implemented by where the safety helmet system included a vibration sensor, GSM and GPS modules that could track the person and send a distress call upon hard impact. Vibration sensors are used when the bike is hitting more this relates to microcontroller board. So, when the rider collides and the rider's helmet hits the ground, the vibration sensor senses the condition and after that controller extracts GPS information and this information passes message to nearby hospital. The rest of the paper demonstrated as below. The proposed works and implementation are described in Section 2 and 3 respectively. Section 4,5and 6 discuss about the software description and results respectively. At last, Section 7 concludes the paper with conclusion.

2.PROPOSED SYSTEM

Road accidents are increasing day by day because the riders are not using the helmet and due to consumption of alcohol. In today's world, huge numbers of people are dying on road accidents. By using smart helmet, the accidents can be detected. The main target of the project is designing a smart helmet for accident avoidance and alcohol detection. The ultrasonic sensor checks if the person is wearing the helmet or not. The MO5 sensor recognizes the alcoholic substance in the rider's breath. If the person is not wearing the helmet and if he consumes alcohol, the bike will not start. If there is no sign of alcoholic substance present and helmet is used, then only the bike will start. At the point when the rider met with an accident, the sensor recognizes the condition of the motorbike and reports the accident. Then the GPS in the bike will send the location of the accident place to main server of the nearby hospitals.

*3.*IMPLEMENTATION

A.ULTRASONIC SENSOR

Ultrasonic sensors work by emitting sound waves at a frequency too high for humans to hear. They then wait for the sound to be reflected back, calculating distance based on the time required. This is similar to how radar measures

the time it takes a radio wave to return after hitting an object. **Ultrasonic sensors can** measure the distance to a wide range of objects regardless of shape, colour or surface texture. They are also able to measure an approaching or receding object.

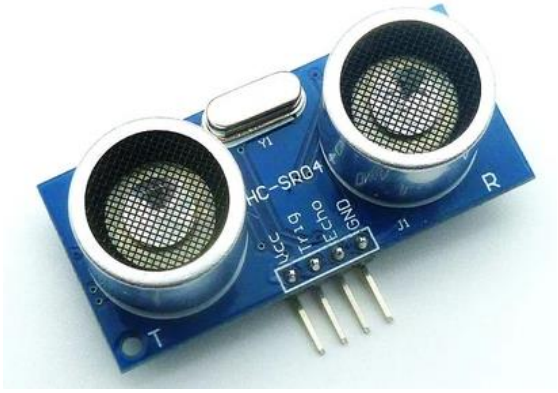


Fig A:Ultrasonic sensor

B.MQ5 SENSOR

Grove - Gas Sensor(**MQ5**) The Grove - Gas Sensor(**MQ5**) module is useful for gas leakage detection (in home and industry). It is suitable for detecting H2, LPG, CH4, CO, Alcohol. Due to its high sensitivity and fast response time, measurements can be taken as soon as possible.

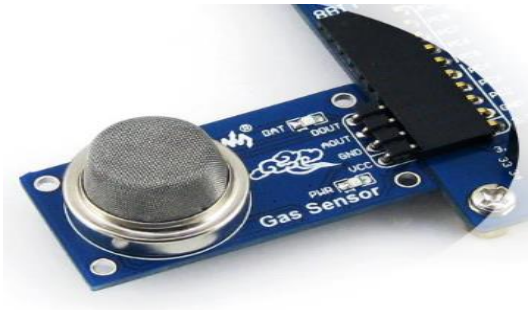


Fig B:MQ5 Sensor

C.ARDUINO UNO

The **Arduino Uno** is a microcontroller board based on the ATmega328. It has 20 digital input/output pins (of which 6 can be **used** as PWM outputs and 6 can be **used** as analog inputs), a 16 MHz resonator, a USB connection, a power jack, an in-circuit system programming (ICSP) header, and a reset button.

Fig C:Arduino uno

D.GSM MODULE

GSM is a mobile communication **modem**. it is stands for global system for mobile communication. A **GSM** digitizes and reduces the data, then sends it down through a channel with two different streams of client data, each in its own particular time slot.

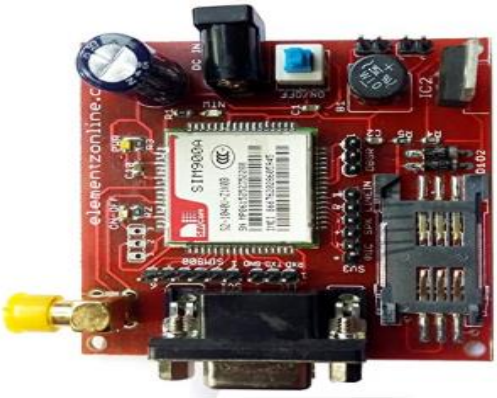


Fig D:GSM Module

E.VIBRATION SENSOR

Vibration Sensor can distinguish whether any impact development or vibration occurs. It yields a low beat flag when vibration is recognized. Vibration sensor is the digital input device. Inside the sensor comparison circuit is present which is used to give voltage to the controller. The VCC is pin of the sensor is interfaced with 5V pin of the microcontroller. The ground is interfaced with the ground of the microcontroller. The A0 pin of the sensor is interfaced with the RA1 pin of the Microcontroller. It identifies the vibration in the range of0-1023.

Fig E:Vibration sensor

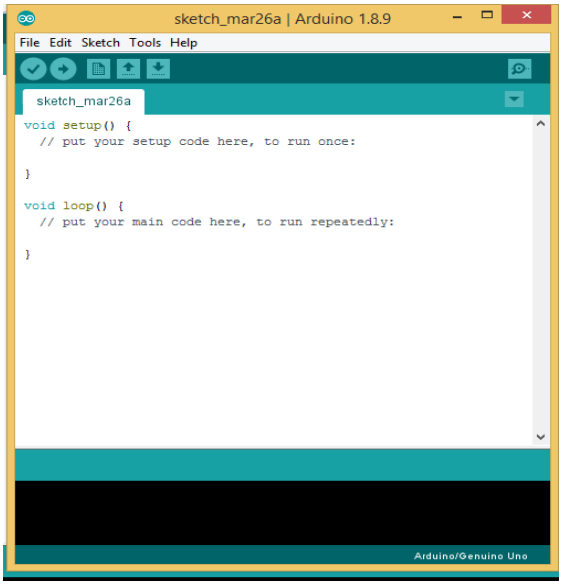
F.MOTOR

An electric **motor** is an electrical machine that converts electrical energy into mechanical energy. Most electric **motors** operate through the interaction between the **motor's** magnetic field and electric current in a wire winding to generate force in the form of rotation of a shaft.

Fig F:Motor

4. SOFTWARE DESCRIPTION

Arduino is a prototype platform (open-source) based on an easy-to-use hardware and software. It consists of a circuit board, which can be programed (referred to as a microcontroller) and a ready-made software called Arduino IDE (Integrated Development Environment), which is used to write and upload the computer code to the physical board.



The key features are:

1.Arduino boards are able to read analog or digital input signals from different sensors and turn it into an output such as activating a motor, turning LED on/off, connect to the cloud and many other actions.

2.You can control your board functions by sending a set of instructions to the microcontroller on the board via Arduino IDE (referred to as uploading software).

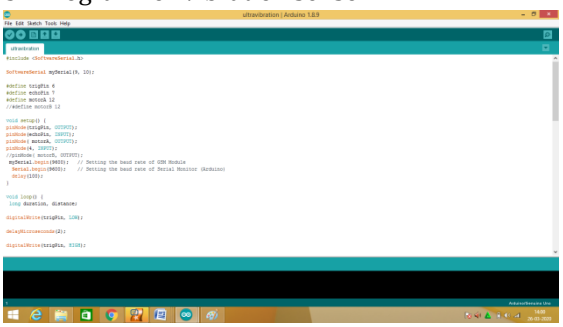
3.Unlike most previous programmable circuit boards, Arduino does not need an extra piece of hardware (called a programmer) in order to load a new code onto the board. You can simply use a USB cable.

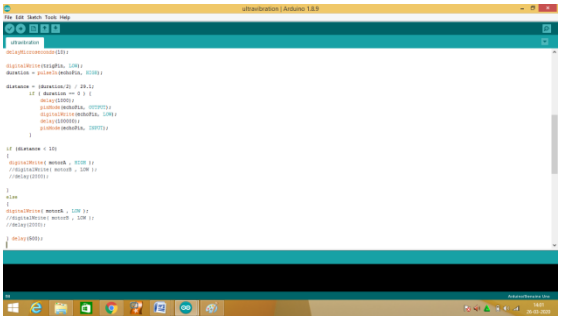
4.Additionally, the Arduino IDE uses a simplified version of C++, making it easier to learn to program.

5.Finally, Arduino provides a standard form factor that breaks the functions of the microcontroller into a more accessible package.

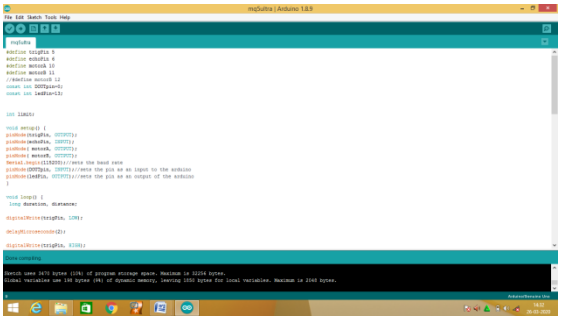
5.SIMULATION RESULT

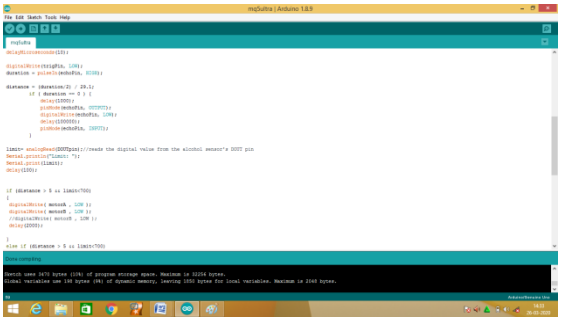
5.1Program for vibration sensor



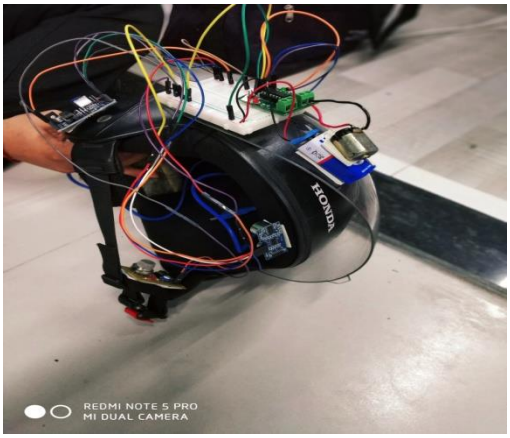


5.2 Program for mq5 sensor





6. HARDWARE RESULT



7.CONCLUSION

Thus we have designed a smart helmet, which would possibly save the life's of people and make the people ride bikes without consumption of alcohol. we developed a smart helmet based system which was successfully able to detect whether the rider as worn the helmet or not. This helmet can reduce number of road accidents that takes place every day. It ensures the safety of the biker as well as sends the message to the ambulance. Also, death rate can drastically be reduced by implementing this circuit as mandatory while driving and make everyone's life easier and smoother.

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