MINI PROJECT

(2021-22)

"E-VAHAN"

End Term Project Report

Institute of Engineering & Technology

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Declaration

I/we hereby declare that the work which is being presented in the Bachelor of technology. Project **"E-VAHAN"**, in partial fulfillment of the requirements for the award of the ***Bachelor of Technology*** in Computer Science and Engineering and submitted to the Department of Computer Engineering and Applications of GLA University, Mathura, is an authentic record of my/our own work carried under the supervision of **Mr. Mandeep Singh , Technical Trainer, Dept. of CEA,GLA University.**

The contents of this project report, in full or in parts, have not been submitted to any other Institute or University for the award of any degree.

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<u>Certificate</u>

This is to certify that the project entitled "E-Vahan", carried out in Mini Project – I , is a bonafide work by Abhya Jain, Anshika Agarwal, Akarsh Agarwal , Anindya Triwedi and Sarthak Agarwal and is submitted in partial fulfillment of the requirements for the award of the degree Bachelor of Technology (ComputerScience & Engineering).

Signature of Supervisor:

Name of Supervisor: Mr.Mandeep Singh

Date: 25 November 2021

ACKNOWLEDGEMENT

Presenting the ascribed project paper report in this very simple and official form, we would like to place my deep gratitude to GLA University for providing us the instructor Mr. Mandeep Singh, our technical trainer and supervisor.

He has been helping us since Day 1 in this project. He provided us with the roadmap, the basic guidelines explaining on how to work on the project. He has been conducting regular meeting to check the progress of the project and providing us with the resources related to the project. Without his help, we wouldn't have been able to complete this project.

And at last but not the least we would like to thank our dear parents for helping us to grab this opportunity to get trained and also my colleagues who helped me find resources during the training.

Thanking You

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ABSTRACT

The Internet of Things (IoT) is making human life easy in all aspects. The applications it offers are beyond comprehension. IoT is an abstract idea, a notion which interconnects all devices, tools, and gadgets over the Internet to enable these devices to communicate with one another. IoT finds application in various areas, such as intelligent cars and their safety, security, navigation, and efficient fuel consumption. This project puts forth a solution to achieve the desired outcome of saving precious human lives . In this context, we propose to develop a system, we are designing and deploying a system that not only avoids accidents but also to take action accordingly. This research aims at dealing with the issues that cause fatal crashes and also integrates measures to ensure safety. Life without transportation is impossible to imagine; it makes far off places easy to reach and greatly reduces the travel time. But the problems which surface due to the ever-increasing number of vehicles on the road cannot be ignored. The project aims to eradicate a few of the major reasons of car crashes and also aims to integrate post-crash measures.

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CHAPTER-1

INTRODUCTION

CONTEXT

This Web Application "E-Vahan" has been submitted in partial fulfilment of the requirements for the award of the degree of Bachelor of Technology in Computer Science and Engineering at GLA University, Mathura supervised by Mr. Mandeep Singh . This project will be completed soon and will been executed in modules, meetings will be organized to check the progress of the work and for instructions and guidelines.

MOTIVATION

The Internet of Things (IoT) is making human life easy in all aspects. The applications it offers are beyond comprehension. IoT is an abstract idea, a notion which interconnects all devices, tools, and gadgets over the Internet to enable these devices to communicate with one another. It utilizes information technology, network technology, and embedded technology. Various sensors and tracking devices are coupled to deliver the desired outcome thus making lives easier. IoT finds application in various areas, such as intelligent cars and their safety, security, navigation, and efficient fuel consumption. This project puts forth a solution to achieve the desired outcome of saving precious human lives that are lost . In the proposed system, we are designing and deploying a system that not only avoids accidents but also to take action accordingly.

OBJECTIVE

The proposed project aims to achieve the following :

• To ensure the driver is not drowsy, eye-blink sensors are deployed in the automobile.

• To circumvent a crash, a proximity sensor is deployed to discover the interruption in front of the automobile on the path.

• To ensure post-crash safety an alert system is deployed which makes use of a GPS system to attain the geographical location of the crashed vehicle and it is sent to a responsible and authorized individual. The accident is detected with the use of a vibration sensor.

• An RFID can be affixed to an object and used to track tools, equipment, inventory, assets, people, or other objects.

• A Fuel Sensor is affixed to make accurate measurements of fuel level in vehicle tanks.

EXISTING SYSTEM

The proposed system utilizes an embedded system based on the Internet of Things and the Global System for Mobile Communication (GSM) To avoid an accident, when the system is initiated, the seat belt is checked using a pressure sensor. If the driver is not wearing a seat belt, the engine is turned off. After this, three things – tiredness and obstacles – are checked using the eyeblink sensor and the proximity sensor, respectively. If there is any obstacle present, then the buzzer beeps to tell the driver. If the driver is feeling sleepy or drowsy, the eye blink sensor detects it and switches off the engine.

1) The system utilizes GSM technology for the communication of code pattern to transmit location coordinates.

2) The system is Arduino Uno based.

3) The system should be able to communicate even from physically far off distances.

4) The system uses a proximity sensor, fuel sensor , RFID , eye-blink sensor, buzzer and humidity sensor.

5) To practically put together all the components and execute them, the composition of various sensing devices in our system is as shown in the figure below.
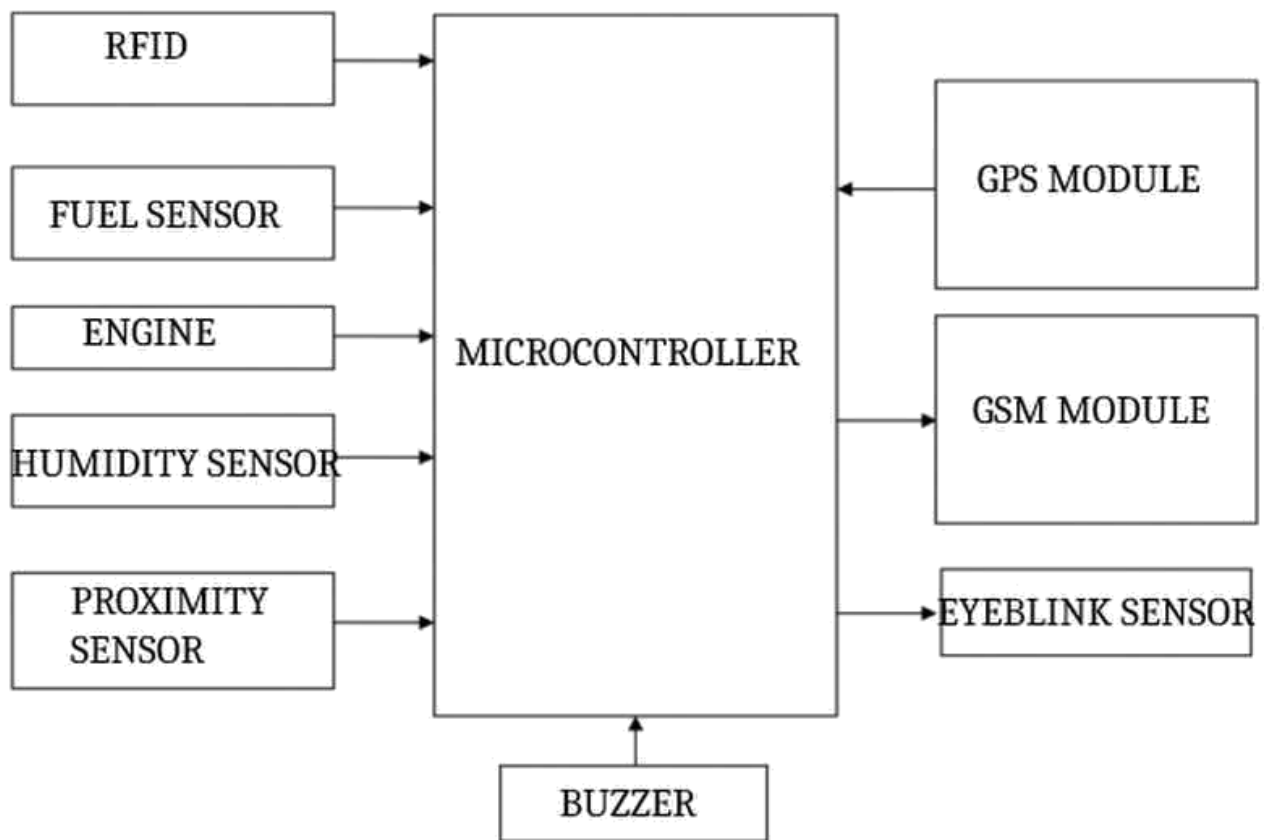
SOURCES

The source of our project (including all the project work, documentations and presentations) will is available at the following link :

https://github.com/abhyaaa/E-vahan.git

CHAPTER -2

SOFTWARE REQUIREMENT ANALYSIS

PROBLEM STATEMENT

The arrangement of the idea to implement the functional requirements is elucidated under the heading system design. The arrangement of the idea to implement the non-functional requirements is elucidated in the system architecture section of this project report. The imperative functional requirements of this project's objective accomplishment are:

1) The automotive system should have the capability to determine the mental awareness of the driver in terms of if he is feeling sleepy.

2) The automotive system should have the capability to check whether the vehicle is not coming too close to the vehicle in front.

3) The automotive system should have the capability to determine whether an accident has already taken place and thus should have the capability of sending the location coordinates of accident to a responsible person with the help of GSM technology.

The assumptions and dependencies are established in the beginning itself to give us a lucid understanding of the implementation of the product:

• Need of an appropriate GPS module to deliver exact geographical location coordinates.

• The driver should be wearing the spectacles eye gear integrated with the eye-blink sensor.

• The system should always be connected to Internet.

• Proper placement of numerous proximity sensors can be added.

HARDWARE AND SOFTWARE REQUIREMENTS

<u>Hardware Requirement</u>

- Processor : Intel i3

- Operating System : Windows 7/8/10

- RAM : 4+GB

- Hardware Devices : Computer System

- Hard disk : 64 GB

- Display : 1366 x 768

<u>Software Requirement</u>

- Technology Implemented : IOT

- Language Used : integrated C

- Database : AWS Cloud

- User Interface Design : HTML , CSS

- Web Browser : Chrome

MODULES AND FUNCTIONALITIES

This project deals with problems which cause accidents and attempts to ensure safety. This project addresses various reasons that lead to fatal accidents. Roads are unpredictable and at every turn of the road can be fatal accidents present and one cannot rely on the driving sense of other drivers and the pedestrians. One needs to be self-aware of the environment and the vehicles around. The driver should take all the precautions and be mindful of the people on the road as well because every life has value. Common reasons for accidents are the

lack of concentration of the driver on the road because of some distraction or because of lack of sleep of the driver. The product aims to provide the following functions:

• External forces should not result in the damaging of the system.

• The framework must be able to explicitly identify and discover problems related to the components.

• The issue detected should be reported back to the system.

About the Sensors

GPS Module

GPS modules contain tiny processors and antennas that directly receive data sent by satellites through dedicated RF frequencies. ... The four well-known Global Navigation Satellite System include GPS, BDS(Beidou), GLONASS and GALILEO four satellite navigation systems.

GSM MODULE

A GSM modem or GSM module is a hardware device that uses GSM mobile telephone technology to provide a data link to a remote network. From the view of the mobile phone network, they are essentially identical to an ordinary mobile phone, including the need for a SIM to identify themselves to the network.

EYEBLINK SENSOR

This Eye Blink Sensor is IR based. The Variation Across the eye will vary as per eye blink . If the eye is closed means the output is high otherwise output is low. This to know the eye is closing or opening position.

FUEL SENSOR

Fuel sensor is a device designed to make accurate measurements of fuel level in vehicle tanks. According to these measurements a GPS tracking and telematics platform features the following data: fuel level in the tank of a vehicle. fuel consumption per time period. average fuel consumption.

HUMIDITY SENSOR
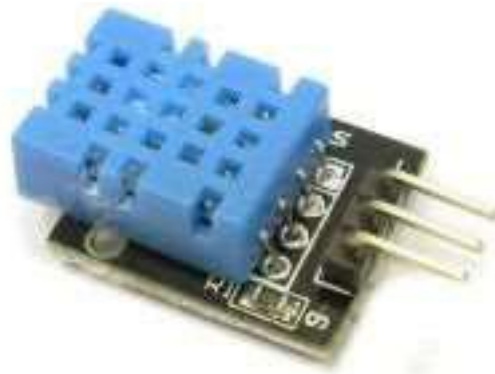
A humidity sensor is an electronic device that measures the humidity in its environment and converts its findings into a corresponding electrical signal. In contrast, absolute humidity is measured without reference to temperature. The two most common RH sensors are the capacitive and resistive humidity sensors

RFID sensors

What are RFID Sensors? RFID sensor tags **detect environmental changes and events and communicate the data wirelessly to an RFID reader**. These telemetry products are ideal in situations where measurements need to be remotely and automatically captured.

Proximity Sensor
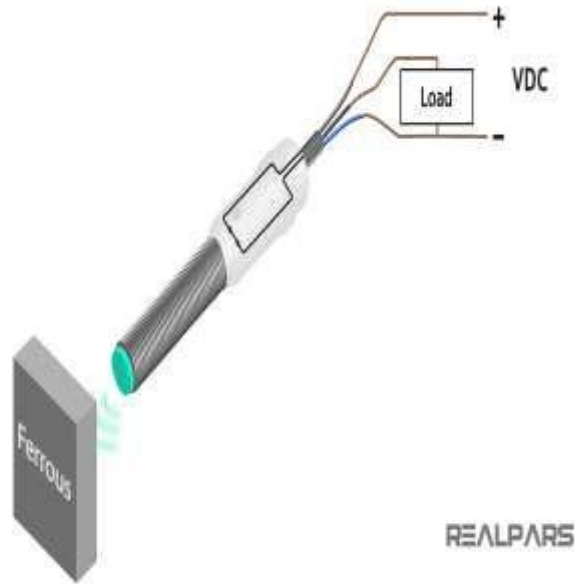
A **proximity sensor** is a sensor able to detect the presence of nearby objects without any physical contact.
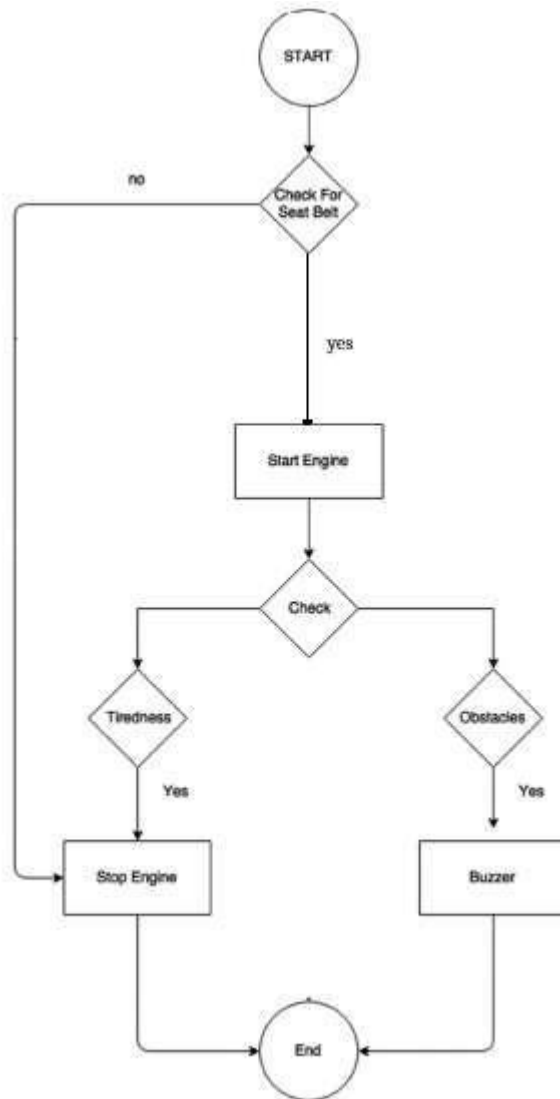
Arduino

Arduino is an open-source hardware and software company, project, and user community that designs and manufactures single-board microcontrollers and microcontroller kits for building digital devices.

CHAPTER- 3

SOFTWARE DESIGN

USE-CASE DIAGRAM:

UML Diagram (Activity Diagram)

Technologies Used

IOT

The Internet of Things (IoT) is a system of interrelated computing devices, mechanical and digital machines, objects, animals or people that are provided with unique identifiers and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction.

Why Use IOT ?

With the internet of things, many devices can connect to each other and send information across. Due to their utility and high levels of automation, there has been an increase in the number of devices being connected to the internet.

.

Languages Used

Integrated C

C is a general-purpose, procedural computer programming language supporting structured programming, lexical variable scope, and recursion, with a static type system. By design, C provides constructs that map efficiently to typical machine instructions. It has found lasting use in applications previously coded in assembly language. Such applications include operating systems and various application software for computer architectures that range from supercomputers to PLCs and embedded systems.
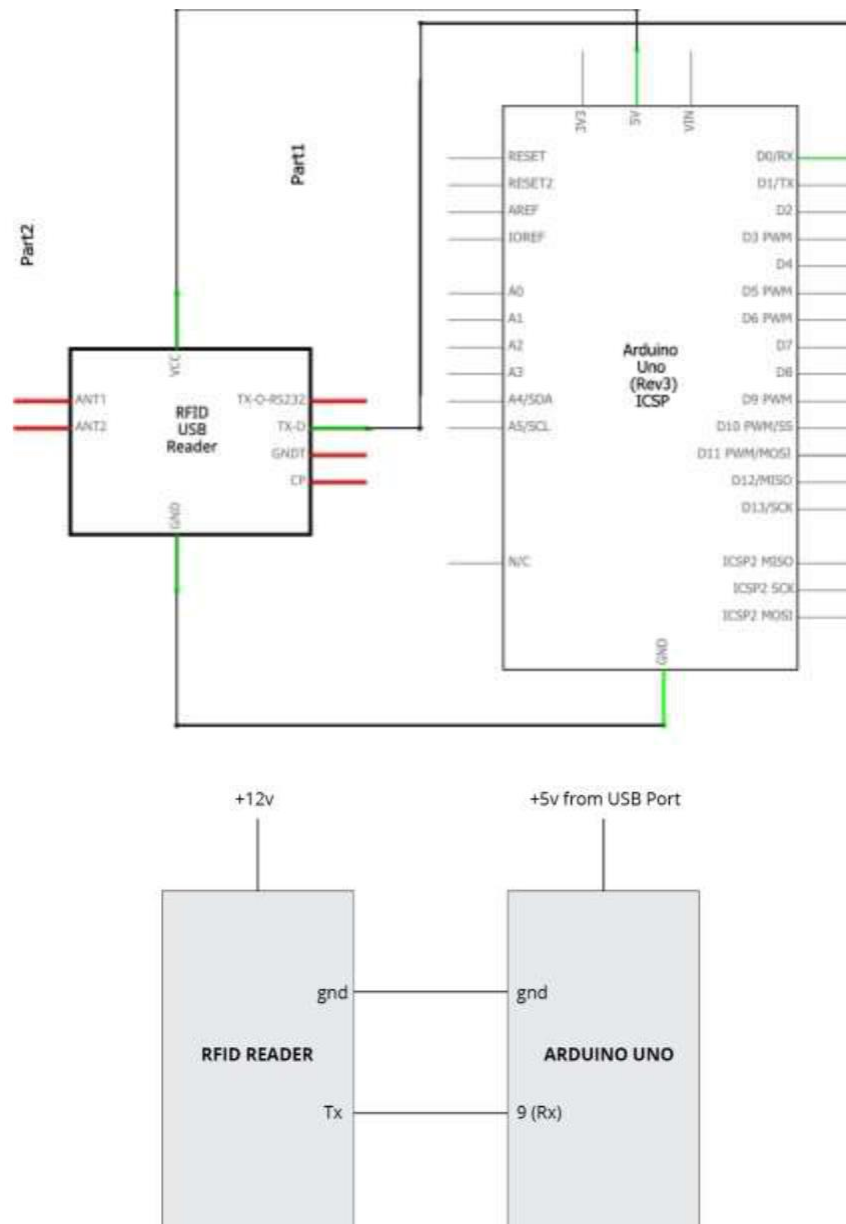
Applications of C

1. Operating Systems - The first operating system to be developed using a high-level programming language was UNIX, which was designed in the C programming language. Later on, Microsoft Windows and various Android applications were scripted in C.

2. Embedded Systems - The C programming language is considered an optimum choice when it comes to scripting applications and drivers of embedded systems, as it is closely related to machine hardware.
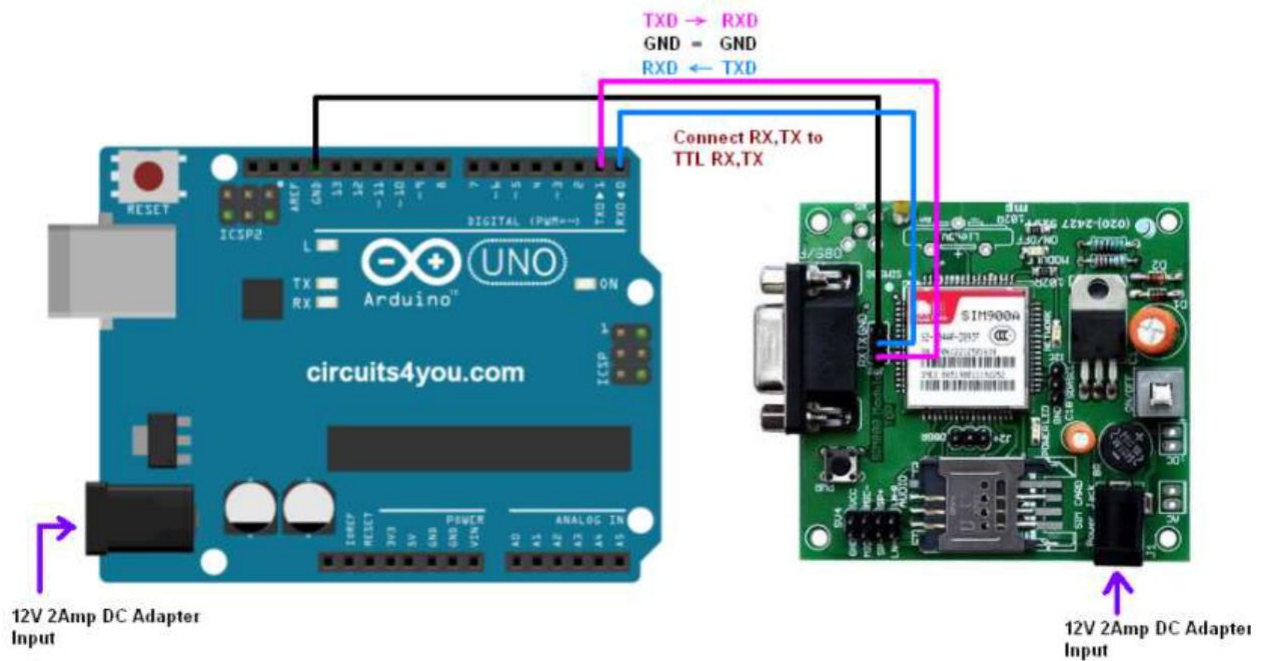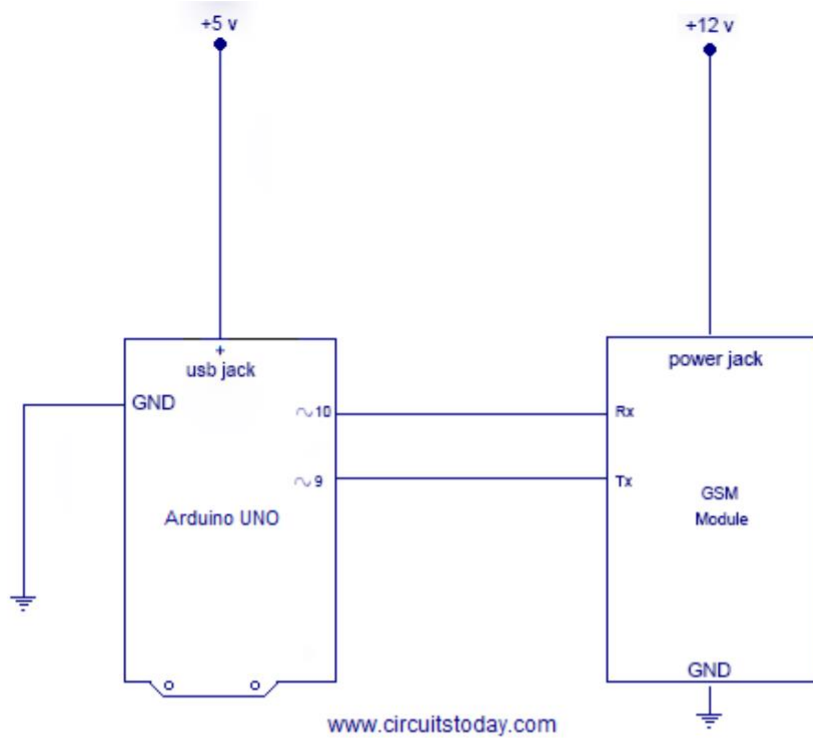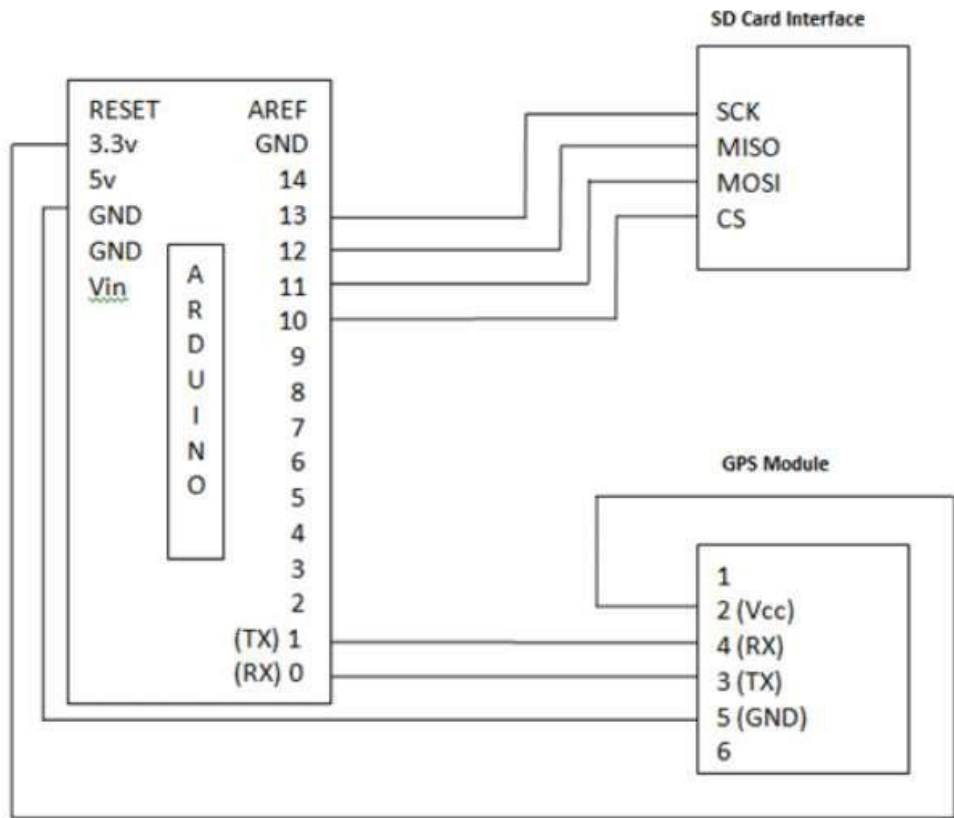
CHAPTER -5

IMPLEMENTATION TILL DATE

RFID

RFID schematic showing Part2 RFID USB Reader connected to Part1 Arduino Uno (Rev3) ICSP with pins: RESET, RESET2, AREF, IOREF, A0, A1, A2, A3, A4/SDA, A5/SCL, N/C on the left; 3V3, 5V, VIN on top; D0/RX, D1/TX, D2, D3 PWM, D4, D5 PWM, D6 PWM, D7, D8, D9 PWM, D10 PWM/SS, D11 PWM/MOSI, D12/MISO, D13/SCK, ICSP2 MISO, ICSP2 SCK, ICSP2 MOSI on the right; GND at bottom. RFID USB Reader pins: ANT1, ANT2, VCC, TX-O-RS232, TX-D, GNDT, CP, GND.

Interfacing RFID Reader to Arduino

- RFID READER with +12v, gnd, Tx
- ARDUINO UNO with +5v from USB Port, gnd, 9 (Rx)

GSM MODULE:-

www.circuitstoday.com

TXD → RXD
GND = GND
RXD ← TXD

Connect RX,TX to
TTL RX,TX
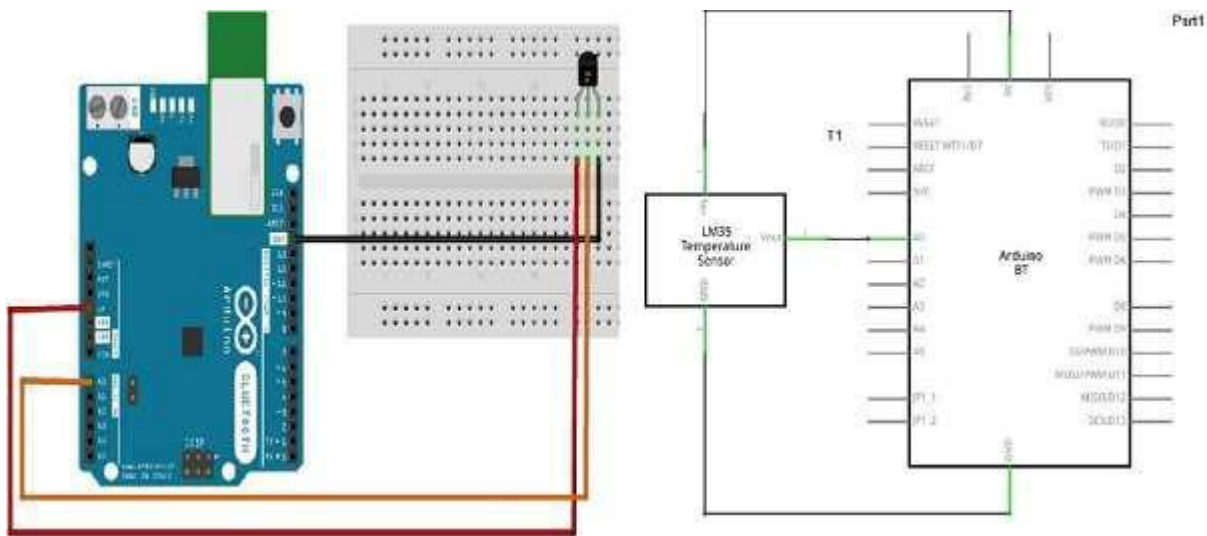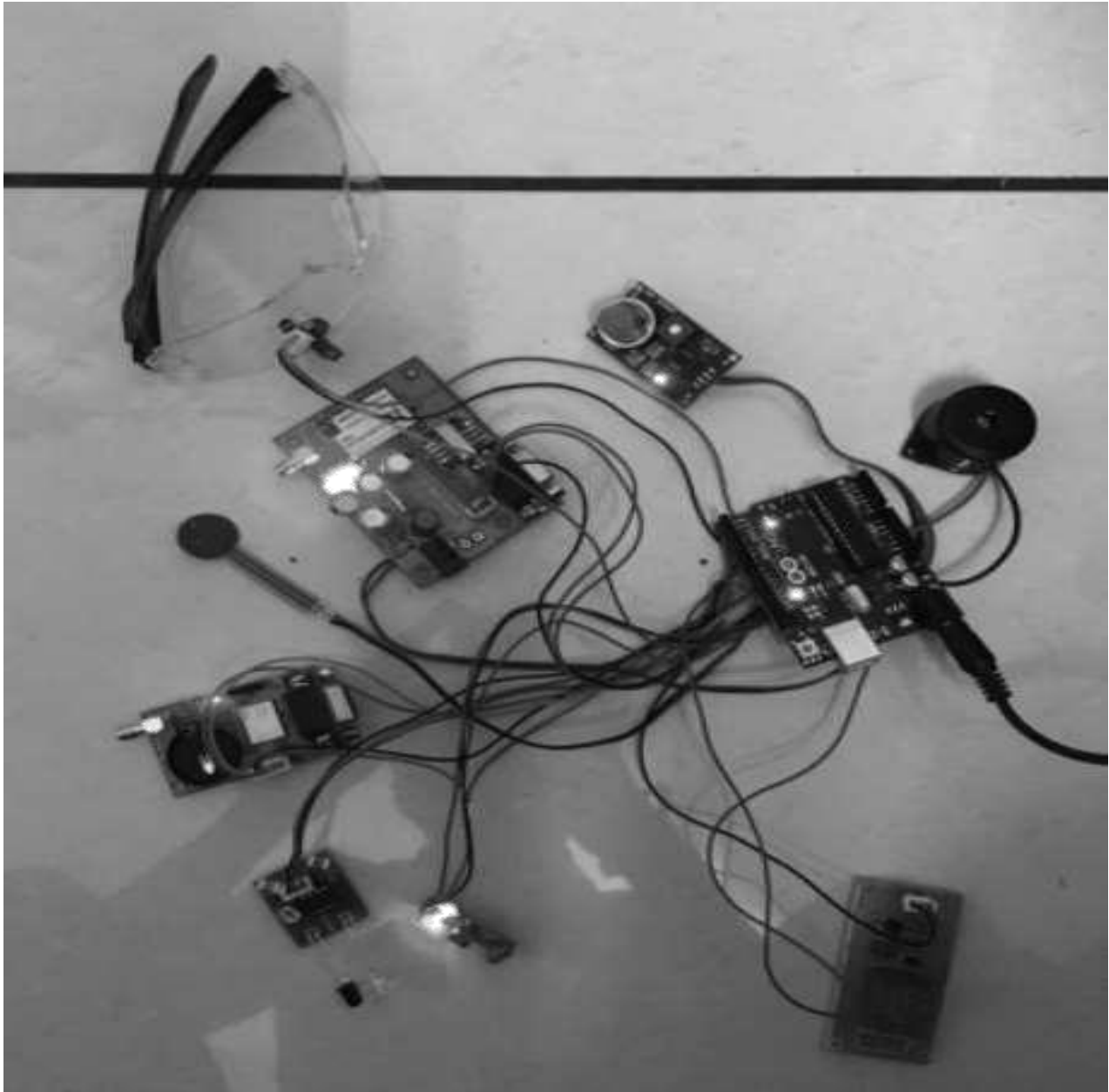
12V 2Amp DC Adapter
Input

12V 2Amp DC Adapter
Input

GPS MODULE:-

DHT Sensor

A competent Smart Vehicle Security and Safety System integrated with a humidity sensor, eye-blink sensor, proximity sensor, RFID and fuel sensor using the concept of GPS and GSM has been implemented. The sensors are integrated with the Arduino board. Areas with outreach problems that experience bad network connectivity or in remote areas with no network connectivity available can be an issue.

CHAPTER - 6

TESTING

TILL DATE

Unit Testing :

Test cases	Description	Expected Outcome	Result
1	Connection with RFID using Relay	Vehicle motor starts	Fail
2	Dht11 sensor	To check the temperature and humidity	Pass
3	Proximetre sensor	To check the distance between the vehicle and obstacle	Pass
4	GPS module	To check the location	Pass
5	GSM module	To check the connectivity	Fail
6	Aurdino	Check all pins are working	Pass

7	Eye blink Sensor	To check driver is sleepy	Pass
8	Module is working	All module working properly	pass

CHAPTER -7

CONCLUSION

By the way of concluding this project is good at cost efficient and easy in assembling the circuit also highly efficient in means of practical.

REFERENCES

www.google.com

DCS and IIOT lab

THANK YOU