Junior Design Project Report

CSE 299

Design of An Intelligent Autonomous Accident Prevention Detection And Vehicle Monitoring System

Submitted By

Md.Mamun Howlader-1610240042

Md,Habibullah Khan-1610961042

Mahabubur Rahman- 1521272042

Supervisor

Dr. Ahsanur Rahman (Ara2)

Assistant Professor

ELECTRICAL AND COMPUTER ENGINEERING

NORTH SOUTH UNIVERSITY

SUMMER-19

Agreement Form

We take great pleasure in submitting our senior design project report on "Design of An Intelligent Autonomous Accident Prevention Detection And Vehicle Monitoring System". This report is prepared as a requirement of the Junior Design Project CSE299 which is a one semester long design course. This course involves multidisciplinary teams of students who build and test IOT devices, websites, mobile apps or engineering processes. Design projects are selected from proposal submitted by the students, or recommended by the course instructor, or text book design problems.

We would like to request you to accept this report as a partial fulfillment of Bachelor of Science degree under Electrical and Computer Engineering Department of North South University.

Declared By:

……
Name:Md.Mamun Howlader
ID:1610240042

……
Name:Md.Habibullah Khan
ID: 1610961042

……
Name:Mahabubur Rahman
ID: 1521272042

Approved By:

……

Supervisor
Dr. Ahsanur Rahman
Assistant Professor, Department of Electrical and Computer Engineering
North South University, Dhaka, Bangladesh

.....

Dr. K.M.A. Salam
Professor & Chair, Department of Electrical and Computer Engineering
North South University, Dhaka, Bangladesh

[Design of An Intelligent Autonomous Accident Prevention Detection And Vehicle Monitoring System]

Abstract:

Today road accident is the massive problem in our country. Everyday so many people are injured and also lost their life by vehicle accident. Most Of The time the victim loses their life because we can not rescue them in time. So every year we lost so many lives by car accident. In our society most of the parents give their car to their children for driving, they don't know where their son is. Most of the time they faces accident but their parents don't know about that. As a result they lost their children. On the other side Application base car sharing services is popular now a days. Most of time time the owner of the vehicles don't know about the present condition of the car. Even the don't know which path the car visits.

In our capital or big cities, there is huge traffic on the roads. So it's very common scene when a vehicle pass another vehicle one of the vehicles got scratches.

So we want to make a device that send us notification when and where the accident occurred and also send the notification to the emergency number that also up to the users.

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CHAPTER 1

INTRODUCTION

1.1 Project Statement:

Today road accident is the massive problem in our country. Everyday so many people are injured and also lost their life by vehicle accident. Most Of The time the victim loses their life because we can not rescue them in timely. So every year we lost so many lives by car accident. In our society most of the parents give their car to their children for driving, they don't know where their son is. Most of the time they faces accident but their parents don't know about that. As a result they lost their children.

So we want to make a device that send us notification when and where the accident occurred and also send the notification to the emergency number that also up to the users

1.2 Motivation:

We make a device with arduino and multiple sensor with GPS module and GSM module that will send the victim current information when he got accident and also help the driver to drive their car in the cloudy or foggy weather .It will send exact GPS location to the emergency services and vehicles owner or many people(it will depend on owner) .Owner can monitor his vehicles any time .If the vehicles have been stolen , owner can easily trace its location. Drivers can take necessary actions to avoid collision .Also driver can easily park at rare gear for rare side collision avoid system

1.3 Background Research

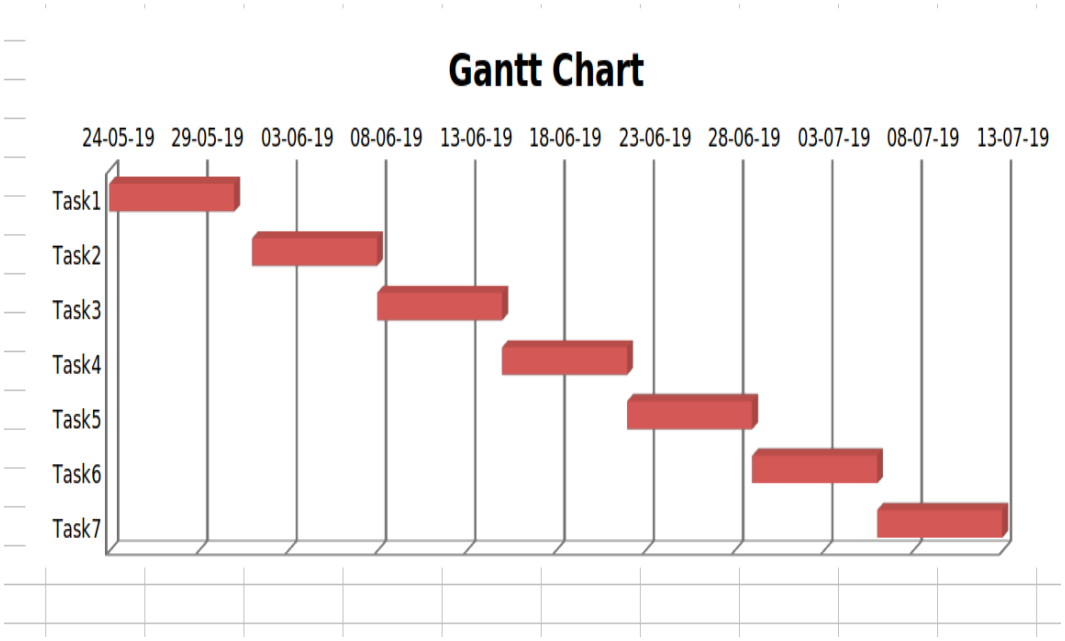
we searched so many project idea on search engine to know about how we improve our idea and apply on our project. We got some idea from those type of project but most of the project is based on accident detection and buzzer system but they don't send the notification to the emergency numbers. But we want to add some specialty on our project that send the notification to the emergency number like Police ,nearest hospital etc. and also send the notification to the victim priority numbers. On this notification victims current location will be sent by this sms.

CHAPTER 2

PROJECT PLAN

2.1 Timeline:

Task Number	Date To Start	Days To Finish	Work
Task1	24-05-19	7	Will buy the tools and testing them r okay or not,will design the circuit diagram of gps module part.
Task2	01-06-19	7	Will complete the full circuit diagram and start arduino code for gps module and gsm module code.
Task3	08-06-19	7	Will complete previous code and start collision avoiding and notification code.
Task4	15-06-19	7	Will complete collision avoiding code and assemble the tools of collision avoiding part.
Task5	22-06-19	7	Complete the previous part and starting assemble the gps and gsm tools with code.
Task6	29-06-19	7	Assemble the sensors ,with both of part and will attach both part.
Task7	06-07-19	7	After attaching will go for a testing.
			Holiday-Eid-Ul_Adha
			Project will be ready for present.



2.2 Division of Work:

Name	Task
Md.Mamun Howlader	Coding and helping to make that device successfully.
Md.Habibullah Khan	Making Circuit diagram and work for doing this project.
Mahabubur Rahman	Testing and work for doing this project.

CHAPTER 3

PROJECT DESIGN

3.1 Tools Used:

1.Arduino Uno

2.Arduino Nano

3.GSM 800l

4.GPS VK-16e

5.16*2 LCD Display

6.Demo Engine Motor

7.Buzzer

8.Registar

9.Hc-Sr04-ultrasonic sensor

10.LED Lights

11.Jumper wire

Table 2.1: Description of Tools

Tool	What it does	Other similar Tools (if any)	Why selected this tool
Arduino Nano	Arduino is an open-source electronics platform based on easy-to-use hardware and software. Arduino boards are able to read inputs - light on a sensor, a finger on a button, or a Twitter message - and turn it into an output - activating a motor, turning on an LED, publishing something online.	Raspberry pi	Raspberry pi is very costly and too heavy to work for this.
Arduino Uno	Arduino is an open-source electronics platform based on easy-to-use hardware and software. Arduino boards are able to read inputs - light on a	Raspberry pi	Raspberry pi is very costly and too heavy to work for this.

	sensor, a finger on a button, or a Twitter message - and turn it into an output - activating a motor, turning on an LED, publishing something online.		
GSM 900a	The SIM900A is a complete Dual-band GSM/GPRS solution in a SMT module which can be embedded in the customer applications allowing you to benefit from small dimensions and cost-effective solutions.Featuring an industry-standard interface, the SIM900A delivers GSM/GPRS 900/1800MHz performance for voice, SMS, Data,	Gsm 800,800l,900D	Gsm 900A is too easy to handle.
GPS Module NEO-6M	The NEO-6M GPS module is a well-performing complete GPS receiver with a built-in 25 x 25 x 4mm ceramic antenna, which provides a strong satellite search capability. With the power and signal indicators, you can monitor the status of the module.	NEO-7M	NEO-6M is ,much available then NEO-7M.
16*2 LCD Display	An LCD is an electronic display module which uses liquid crystal to produce a visible image.	**N/A**	
Demo Engine Motor	IT's mainly used to indicate that our current source converted into ac to dc and cool the environment of transformer area.	**N/A**	
Buzzer	It gives a sound for notification.	N/A	
Registar	It mainly control the flow of current.		
Hc-Sr04-ultrasonic sensor	Ultrasonic sensors work by emitting sound waves at a frequency too high for humans to hear. They then wait for the	N/A	

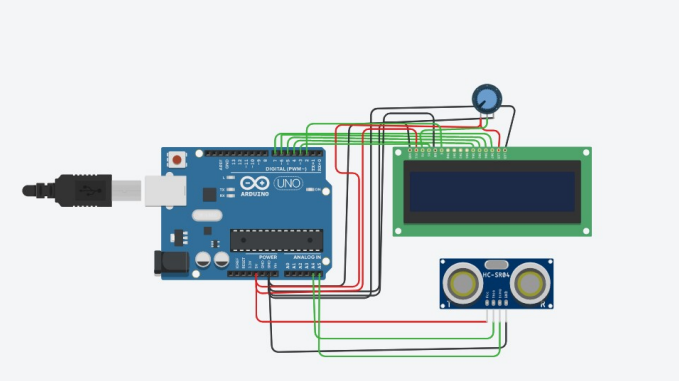
	sound to be reflected back, calculating distance based on the time required. This is similar to how radar measures the time it takes a radio wave to return after hitting an object.		
220 to 12 volt step down transformar	It will convert 220 volt ac current to 12 volt ac current.	Adaptors	Transformer is more reliable then adaptors.
Jumper wire	Jumper wire connects tools to each other.	N/A	

Table 2.2: Sources of Tools

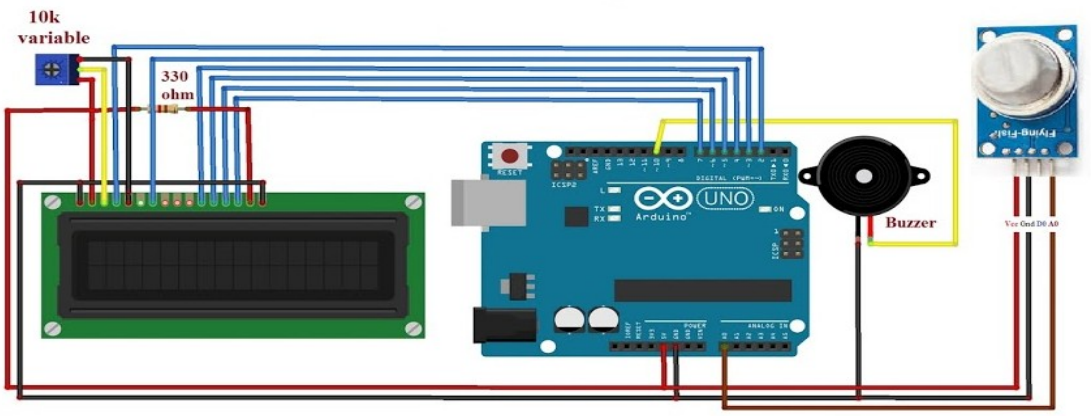
Tool	**Source**	**Cost (if any)**
Arduino Uno	Robiul Electronics,mirpur.	3*400=1200
Arduino Nano	Robiul Electronics,mirpur.	3*300=900
GSM 900a	Robiul Electronics,mirpur.	1300
GPS VK-16e	Robiul Electronics,mirpur.	800
16*2 LCD Display	Robiul Electronics,mirpur.	120
Demo Engine Motor	Robiul Electronics,mirpur.	25
Buzzer	Robiul Electronics,mirpur.	4*5=20
Registar	Robiul Electronics,mirpur.	50
Hc-Sr04-ultrasonic sensor	Robiul Electronics,mirpur.	3*220=660

Transformar	Robiul Electronics,mirpur.	400
Jumper wire	Robiul Electronics,mirpur.	300

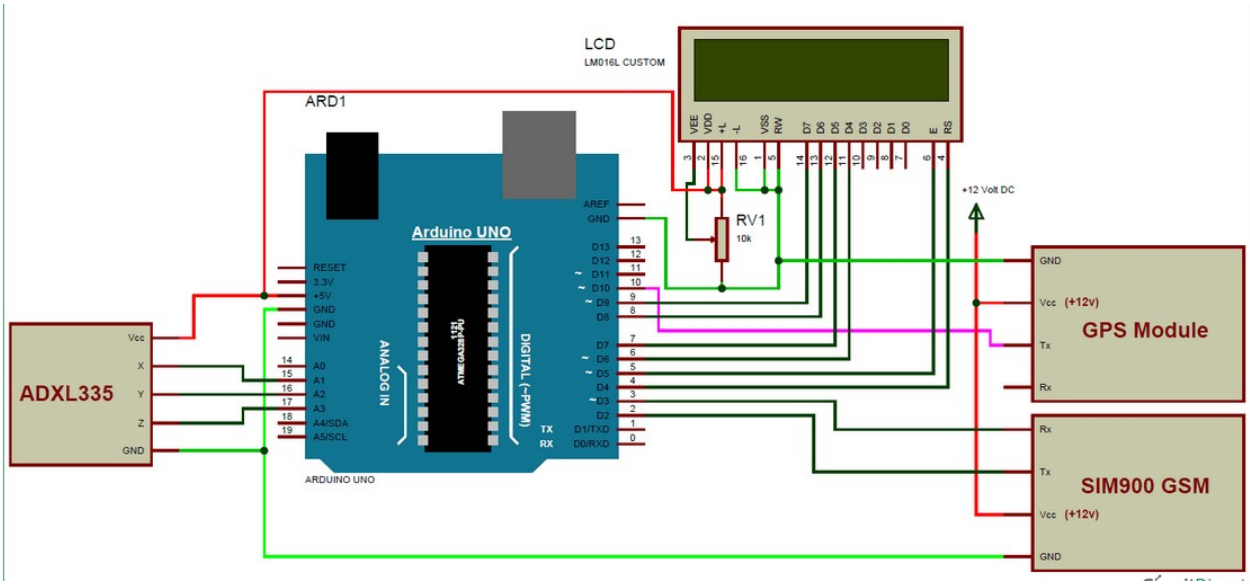
3.2 Technical Design



This the circuit diagram that a sonar sensor and a lcd display are connected to the arduino uno and that give us the real distance between the two car is come closer at exact distance it send us notifications.



On this circuit diagram there is a mq5 gas sensor and a buzzer and a display connected with the arduino uno. It will send us notification if the engine become over hit or if the gas is leakage and alert us also buzzing.



On This circuit A GPS module that send the exact location of the car and a GSM module that send the notification to the mobile phone are connected to the arduino and a lsd display also connected to the arduino to see the result of this.

Arduino Uno: https://components101.com/microcontrollers/arduino-uno
GPS Module: https://www.electroschematics.com/14423/neo-6m-gps-module/
GSM module: https://electronicsforu.com/resources/gsm-module
Sonar sensor: https://howtomechatronics.com/tutorials/arduino/ultrasonic-sensor-hc-sr04/
Gas Sensor: https://www.waveshare.com/mq-5-gas-sensor.htm

CHAPTER 4

PROJECT DESCRIPTION

4.1 Availability:

Here is the gitlab link for the codes of Arduino-https://gitlab.com/Mamun707/cse299 .I already add you as a guest on this project.(MD.Mamun Howlader)
Here is the contact information of my team met –Md.Habibullah Khan(phone-01676924750)

4.2 High Level Description

We implemented this project by using Arduino and other tools that already discussed before We use sonar sensor for sending the notification of the remote car and if our get accident it will message the driver .We implemented a gas sensing system on this device by using mq5 sensor that send the condition of the engine if the engine become hot and if the gas leakage is occurred. Then we implemented a black-box that store the car condition, If the car is got accident it will store the information of the car condition when its got accident. We implemented a GPS system that send the notification to the owner where the car is,

4.3 Key Features:

1.Give the exact location of the car

2.Give the result if the engine is heat excessively

3.Give the result if the gas is leakage on your car

4.give the alert message if your car get closed to another car a specific distance.

5.If the car is got accident , it will send the notification to the nearest police station and hospital and other contact that the owner is provided.

CHAPTER 5

PROJECT SUMMARY

5.1 Results and Comparison:

This project is totally new idea. In previous one part of our idea implemented but not like us. We make this more efficiently to compete the serious problem of roads accidental problem. In previous they make just a accident notification with a switch but here we made our device with a lots of features and automatic accident identification and sending notification system with gps location.

In our device we added vehicles collision avoiding and monitoring system,engine temperature monitoring system, gas leakage and monitoring system,accident detection and send notification with gps location and a black box for vehicles.

5.2 Non-technical Issues and Solutions:

We faced a lots of non-technical issue:

Time constraint: Sometimes we couldn't complete in time. So we have to work more next week to overcame this situations.
Financial constraint: We found many of our tools was not in good position or dead so we had to face financial problems.
Resource constraint: We work for a very new idea so we faced some resource crisis. We got those from inter net.

5.3 Technical Issues and Solutions:

Technical issue is very common that we faced to develop our device.

Circuit diagram: We mainly faced in our circuit diagram part. There was no well-known site to develop the circuit diagram part. But at last we found tinkercad.com and there we develop our this part.

5.4 Future Direction:

We made this device step by step. We divided all the device in some part. And by this way we completed our project.

5.5 Conclusion:

After compete the project we tested several time. And every time we got positive result. Every time we got accurate results.

REFERENCES

- Use ieee format
- Group similar references

APPENDIX A

INDIVIDUAL CONTRIBUTIONS

APPENDIX B

[Who did which part of the project, who implemented which feature, who bought/collected tools, who wrote which part of the report, who surveyed users and/or tested the final product/tools, etc.]

MAPPING WITH COURSES

APPENDIX C

Mapping with BS courses

SI	Course Code	Course Title	Course contents that were used in this project and how
			• •