

AHSANULLAH UNIVERSITY OF SCIENCE & TECHNOLOGY

Project Report On

“Car Safety System”

CSE 3216: Microcontroller Based System Design Lab

SPRING 2021

Group: B2

Submitted To

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Date of Submission: 16 March 2022

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Objectives

The main objective of this project is to reduce the occurrence of car accidents and its consequences. Our advanced system will ensure the safety of the passengers, detect an impending collision, and alert the driver. The project aims at warning passengers to fasten seatbelts, detecting the obstacles in front of the car, and opening the airbag when the collision occurs with heavy obstacles, giving an alert when the speed is very high. The whole system will be controlled through the android interface.

Social Values

Day by day, the number of vehicles as well as road accidents are increasing. This system makes the car protected by preventing the chance of major accidents. Seat belts are the best defense against passengers and drivers. So, if anyone misses wearing a seat belt, our system will alert him/her and compel him to buckle up. Forward collision warning is also a part of this system and it gives you an alert if something in the road ahead from stopped vehicles to pedestrians, cyclists, and animals. Automatic emergency braking can activate the brakes if you ignore the forward collision alerts which will be very effective to save us from the accident. Most fatal accidents occur due to over speeding. So, if the car reaches high speed (100 km/hour), then our system will provide an alert. But by any chance when there is a moderate to severe crash, then an airbag will open to protect us. Airbags reduce the chance that your upper body or head will strike the vehicle's interior during a crash. In the event of a collision, the vehicle will conduct an automatic crash notification call. This is how you can make your journey secure by using this system.

Required Components

The following parts and tools are required for building this project -

- Arduino UNO R3
- Bread Board
- LDR Module
- Connecting Wires
- HC 05 Bluetooth Module
- IR Module
- 10K Potentiometer
- HC SR04 Ultrasonic Sensor
- NPN Transistor
- Buzzer
- LED
- GY-521 Module
- AI thinker A9G GSM/GPRS Module
- Load Sensor 50kg
- USB to TTL Converter

Working Procedure

- ❖ Many drivers stay busy with phone or other work and they do not notice sudden obstacles. Our Ultrasonic Sensor will detect sudden obstacles and alarm the driver through Buzzer & LED.
- ❖ IR Sensor emits the light when any object comes too close behind the car.
- ❖ SIM 900A GSM Module sends it to an emergency contact during critical situations.
- ❖ Bluetooth Module helps the user to connect our device through the smartphone.

Budget Comparison

Estimated Budget

Equipment	Quantity	Budget (Tk)
Arduino Mega 2560 R3	1	1450
SIM9001 GSM GPRS	1	700
NEO-6M GPS	1	450
Accelerometer ADXL335	1	390
Vero Board (Dotted)	1	25
HX711AD Weight Sensor	1	140
12V 300RPM DC Motor	2	520
Buzzer	1	15
HC-05 Bluetooth Module	1	275
Connecting Wire	As required	100
8 Volt Battery	2	110
Ultrasonic Sensor	1	100
Total		4275

Actual Cost

Equipment	Quantity	Budget (Tk)
Arduino UNO R3	1	650
Bread Board	3	190
LDR Module	1	45
Connecting Wires	4	200
HC 05 Bluetooth Module	1	250
IR Module	1	35
10K Potentiometer	2	20
HC SR04 Ultrasonic Sensor	1	65
NPN Transistor	5	10
Buzzer	1	10
LED	6	06
GY-521 Module	1	160
AI thinker A9G GSM/GPRS Module	1	1500
USB to TTL Converter	2	220
9 Volt Battery	1	90
Total		3451

Difference of cost = (Estimated Budget – Actual Cost)

= BDT (4275-3451)

= BDT 824

Contribution of Team Members

We, 4 members of our group, worked together in the varsity campus, from the very first, to come up with the project idea, setting up our project plan, connect the components, coding the system, and building the prototype till the end of completing the project. Hence, the contribution of all the team members was equal.

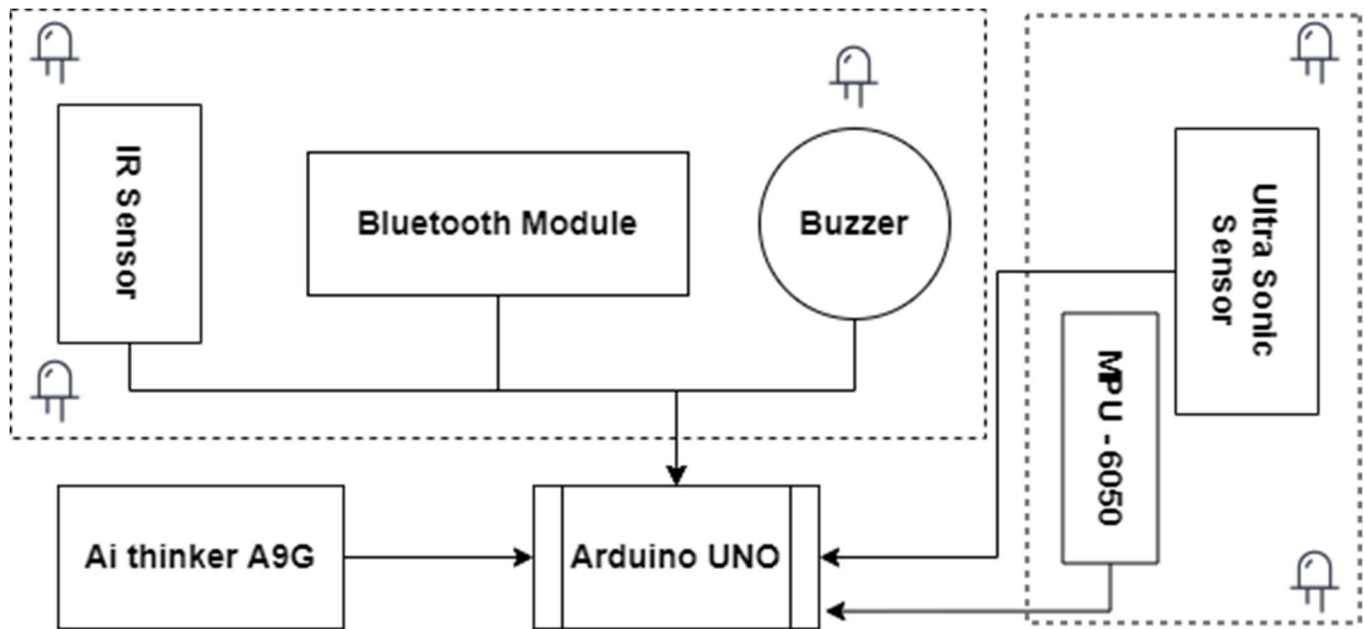
Depending on it, the percentage can be,

- Shohanur Rahman – 18.02.04.127 – 25%
- Samina Mahjabeen – 18.02.04.129 – 25%
- Md. Zahidul Haque – 18.02.04.136 – 25%
- S. M. Tasnimul Hasan – 18.02.04.142 – 25%

Challenges of the Project

Collecting all the required components was a great challenge. After buying many components, we found out that many of them were not working properly. Then we had to find out the components which were able to work properly for our project. While coding, we faced many errors in our code. Then we added many libraries to solve those errors.

Final Block Diagram:



Conclusion

In this Arduino-based project, we will implement a Car Safety System. Our system will reduce the occurrence of car accidents and their consequences. Road accidents are increasing day by day in recent times. Our advanced system will ensure the safety of the passengers. Our users can make their journey safe & secure by using this system.