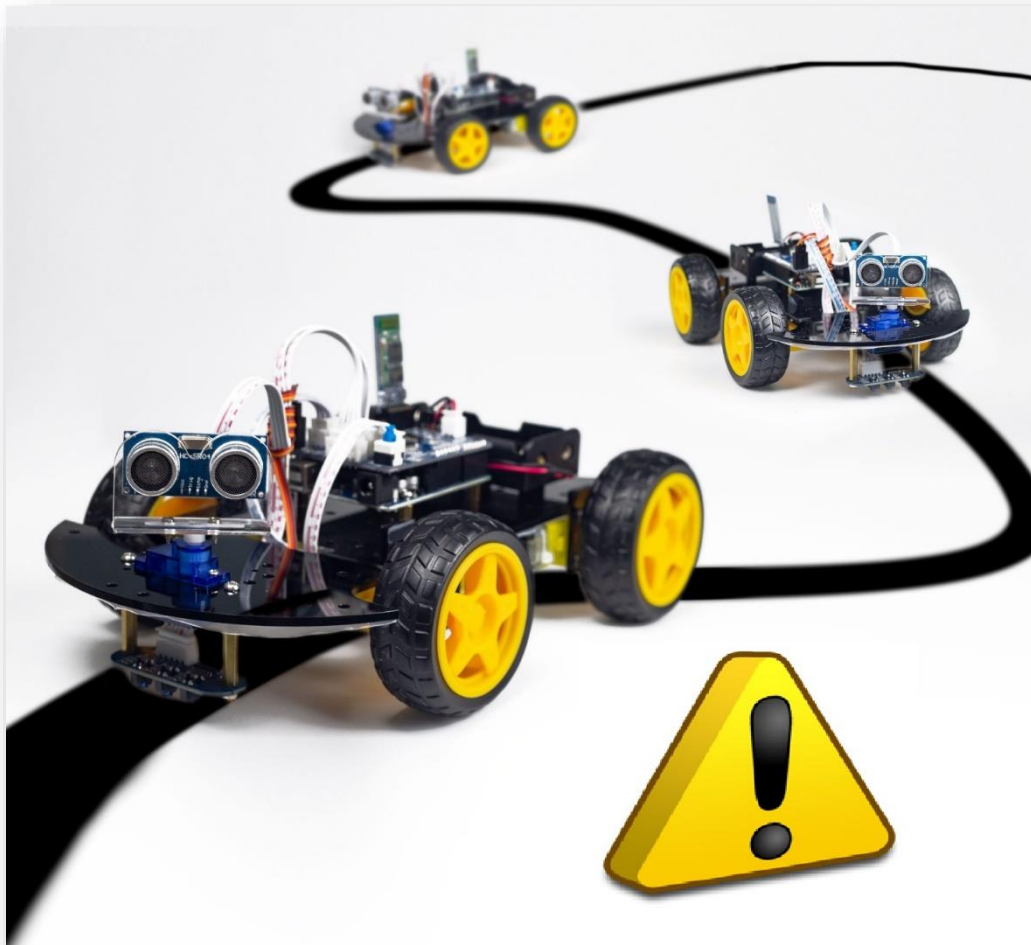# SMART ACCIDENT P.R.O. SYSTEM

(Prevention-Rescue-Occlusion)

Case-Study by:

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Description

- In the recent times, road accidents have become a common phenomenon. A number of lives are wasted due to such accidents every day. However, people tend to ignore the risk of the accidents as well as their after effect, if alive. The government also tend to ignore such a major concern. About 1.25 million deaths are registered every year due to the road accidents. Also, the number of people alive & suffering from after effects are an addition.

- With the invention of IOT, this loss of lives and money can be reduced. IOT is an ideal software component that connects physical and everyday devices to the internet. Devices built based on IOT are capable of communicating with each other over the internet, and they can be controlled to perform different operations.

- Connected vehicles, through the help of IOT, will help to reduce accidents. Due to its highly sophisticated mode of operation, accidents can be foreseen and prevented. The proposed system aims for three objectives: Prevention, Rescue & Occlusion of road accidents. The system uses different physical sensor to determine the current status of the vehicle and helps to predict and consequently, prevent the accident from happening. The system also aims on minimizing the effect of a road accident. For rescue operations, the system provides a notification feature which sends a notification to the emergency contacts as well as to the ambulance of a nearby hospital. These features certainly makes the system a P.R.O. system.

- In years to come, the safety of road users will be assured since accidents would be a rare occurrence. Loss of lives due to faults and ignorance will be as antique as Black and White movie in the future since IOT will be introduced in almost all the road-driven vehicles and will surely prove to be a breakthrough in the context of road safety.

Objective

- The system aims at accomplishing the following objectives:

  - Accident prediction using Machine Learning Algorithms.
  - Airbag opening time optimization.
  - Auto braking system.
  - Notifications to the nearest hospital with location coordinates.
  - Traffic signal clearance for the route of ambulance.
  - Assisting municipal department to identify an accident-prone zone.
  - Assisting traffic department in imposing fine.
  - Real time location of ambulance shared with emergency contacts.
 - Support for Android® as well as IOS® smartphones.
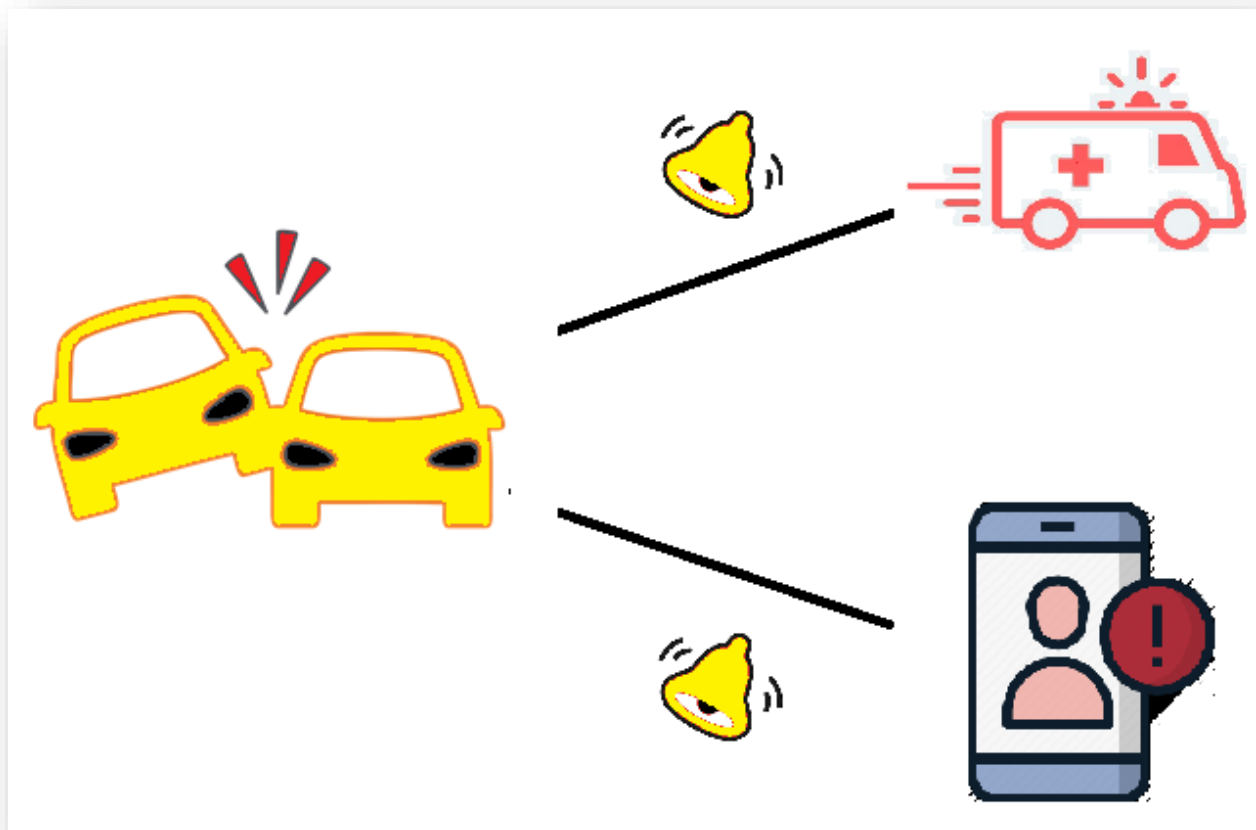
Scope

- The system deals with the following entities:

  - Victim & family
  - Hospital
  - Traffic Department
  - Municipal Department
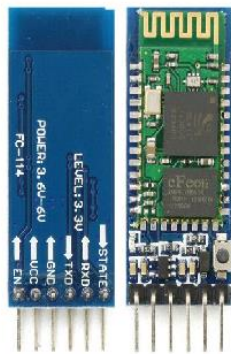 - Insurance Company
  - Car Manufacturer
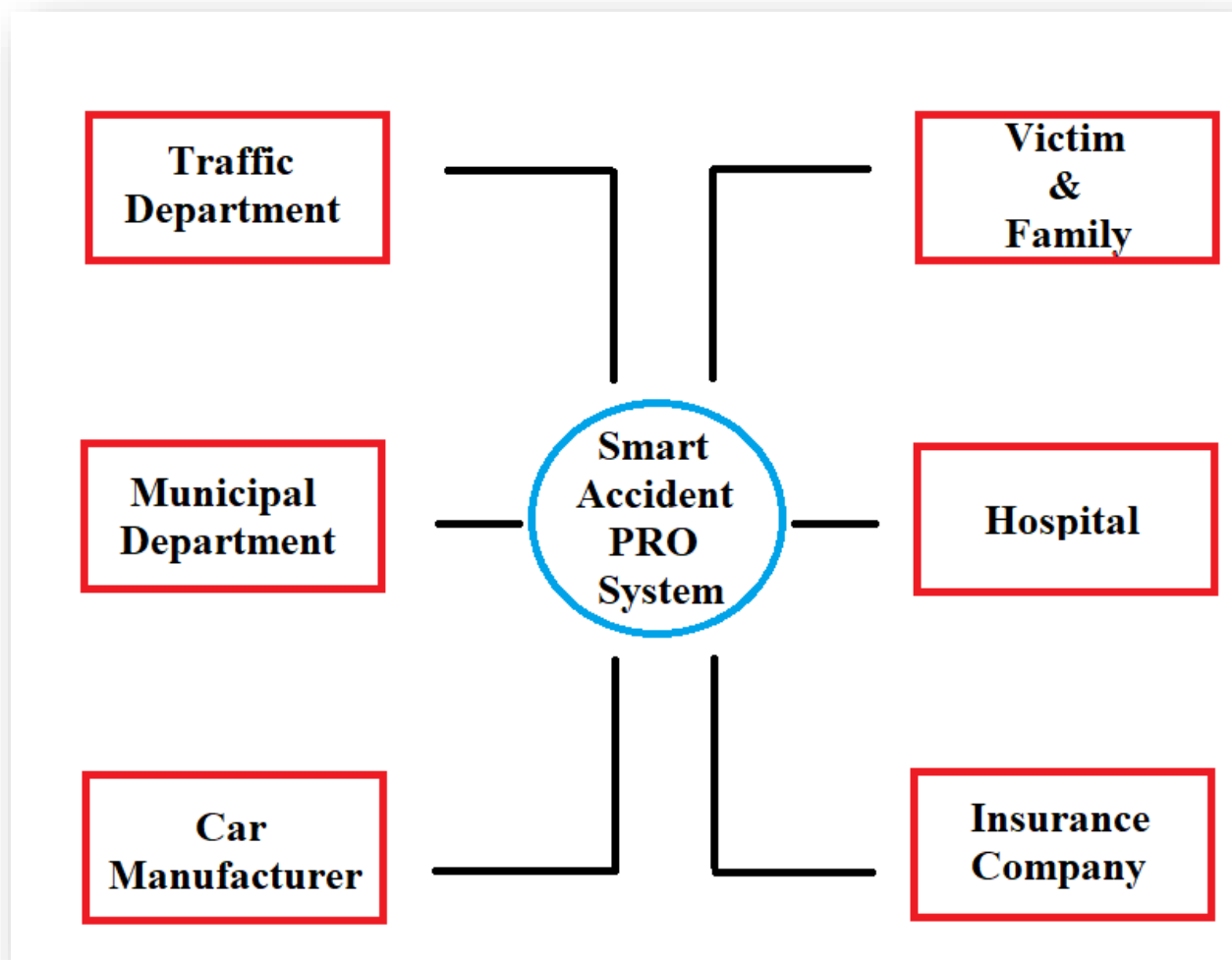
Technical Details

"Things" Included	Information Communicated	Technology Used
Arduino	-	Uno
Ultrasonic Sensor	Distance	Serial
Bluetooth Module	Serial Communication	Wireless
DC Motor	O/P	Rpm
LEDs	O/P	Light
Transistor	Current	NPN
Breadboard	-	-
Battery	Power	Voltage
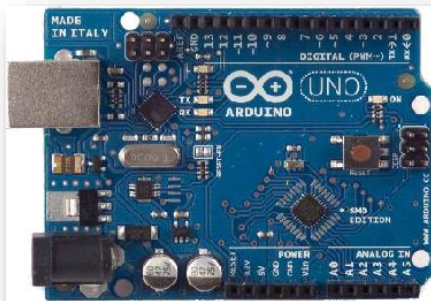
Arduino Uno

Ultrasonic Sensor

Bluetooth Module

DC Motor

LEDs

Breadboard

Battery

Circuit Diagram
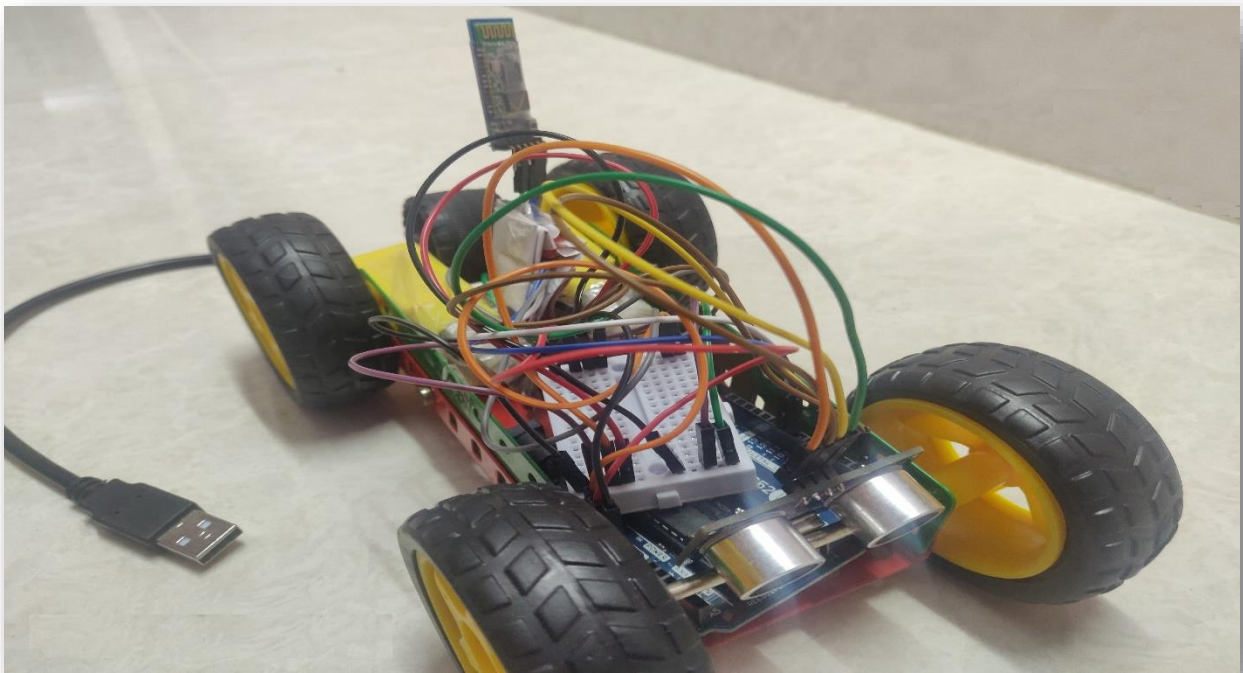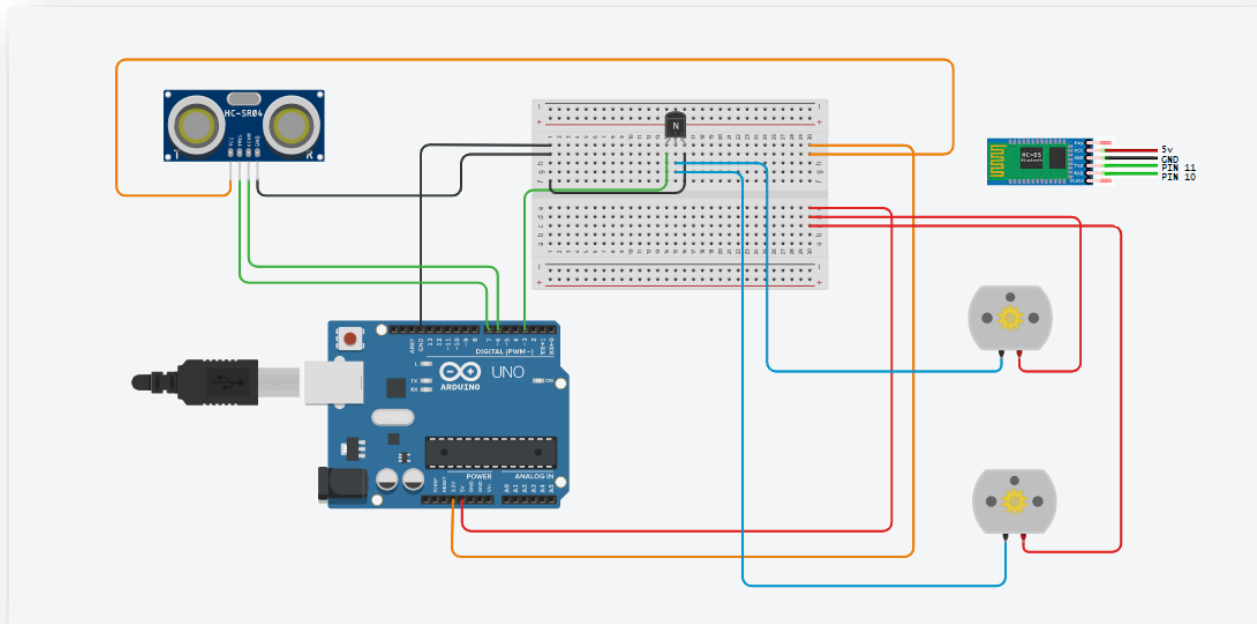
Implementation Details

ULTRASONIC SENSOR	
VCC	PIN-3.3V
GROUND	PIN-GND
TRIG	PIN-7
ECHO	PIN-6
BLUETOOTH MODULE	
VCC	PIN-5V
GROUND	PIN-GND
RX	PIN-10
TX	PIN-11
DC-MOTOR	
TERMINAL-1	PIN-5V
TERMINAL-2	TRANSISTOR-BASE
TRANSISTOR	
COLLECTOR	PIN-3
BASE	DC-MOTOR TERMINAL-1
EMITTER	PIN-GND
LEDs	
ANODE	PIN-4/5
CATHODE	PIN-GND

```
bt_ult

#include <SoftwareSerial.h>

SoftwareSerial BTserial(10, 11); // RX | TX

int motorPin = 3;
const int trigPin = 7;
const int echoPin = 6;
long duration;
int distance;
void setup() {
  BTserial.begin(9600);
  pinMode(trigPin, OUTPUT);
  pinMode(echoPin, INPUT);
  Serial.begin(9600);
  pinMode (motorPin, OUTPUT);
  pinMode (13, OUTPUT);
  pinMode (5, OUTPUT);
  pinMode (2, OUTPUT);
}
void loop() {
```

```
bt_ult

  delayMicroseconds(2);
  digitalWrite(trigPin, HIGH);
  delayMicroseconds(10);
  digitalWrite(trigPin, LOW);
  duration = pulseIn(echoPin, HIGH);
  distance = duration * 0.034 / 2;
  Serial.print("Distance: ");
  Serial.println(distance);


  BTserial.print(distance);
  BTserial.print(",");
  BTserial.print("-");
  BTserial.print(",");
  if(distance<=7){
    BTserial.print("--");
  }
  else{
    BTserial.print("Safe.");
  }
```

```
bt_ult

  if(distance<7){
    BTserial.print("Accident!!!");
  }
  else{
    BTserial.print("--");
  }
  BTserial.print(";");

  if(distance>7){
    digitalWrite (13, HIGH); // led
    digitalWrite (motorPin, HIGH);
    digitalWrite(2,LOW);
    digitalWrite(5,HIGH);
  }
  else{
    digitalWrite (13, LOW); // led
    digitalWrite (motorPin, LOW);
    digitalWrite(5,LOW);
    digitalWrite(2,HIGH);
  }
```