

## **Detail Report of Project: Obstacle avoiding car**



**Pak-Turk MAARIF Int'l Schools and  
Colleges, Islampura, Lahore.**

**TEKNOFEST**

**AEROSPACE AND TECHNOLOGY FESTIVAL**

**SMART TRANSPORTATION COMPETITION**

**PROJECT DETAIL REPORT**

**PROJECT NAME:** Obstacle avoiding car

**TEAM NAME:** The Achievers-OA

**TEAM ID:** T3-22887-202

**TEAM LEVEL:** Primary School-Secondary School

**TEAM MEMBERS:** Asim Rizwan

**ADVISOR NAME:** Sadia Ejaz

## Project Detail Report

### 1. Project Summary:

Our project is based on an obstacle avoiding car which can automatically sense the obstacle in its way and avoid it by changing the direction. This design allows the robot to navigate in unknown environment by avoiding collisions which is primary requirement for autonomous mobile vehicle. Its designed as four wheeled car having board at its top and ultrasonic sensor at the front to avoid the obstacles.

### 2. Problem/ Issue:

Road accident is a major issue in many countries, mostly fast moving vehicles face collision on roads. Usually to avoid the collision and accidents on the road the road breakers and traffic police wardens are controlling the flow of traffic.

Even if the person is cable of following the traffic rules sometimes the weather conditions abruptly changes and the driver cannot control the happenings.

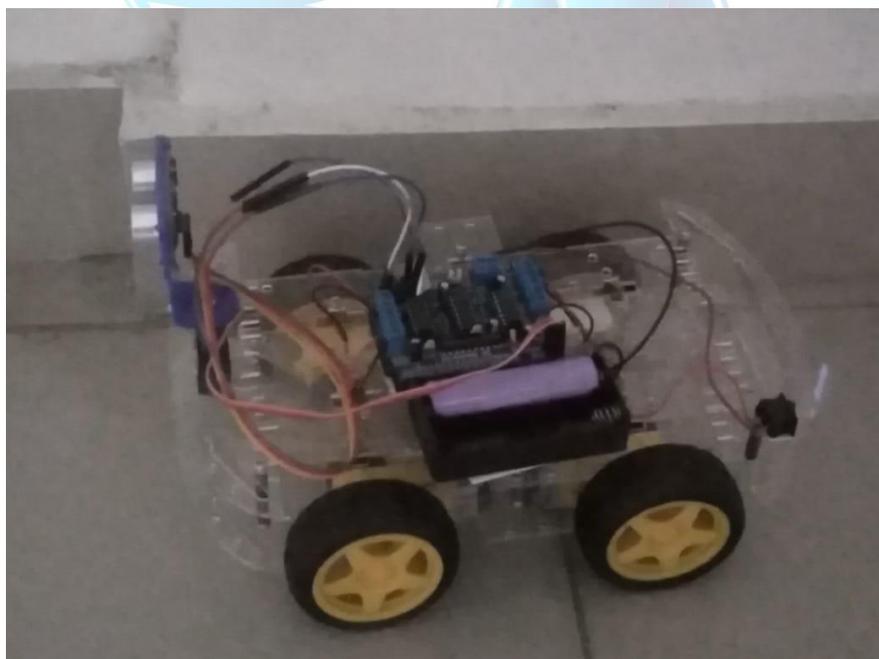
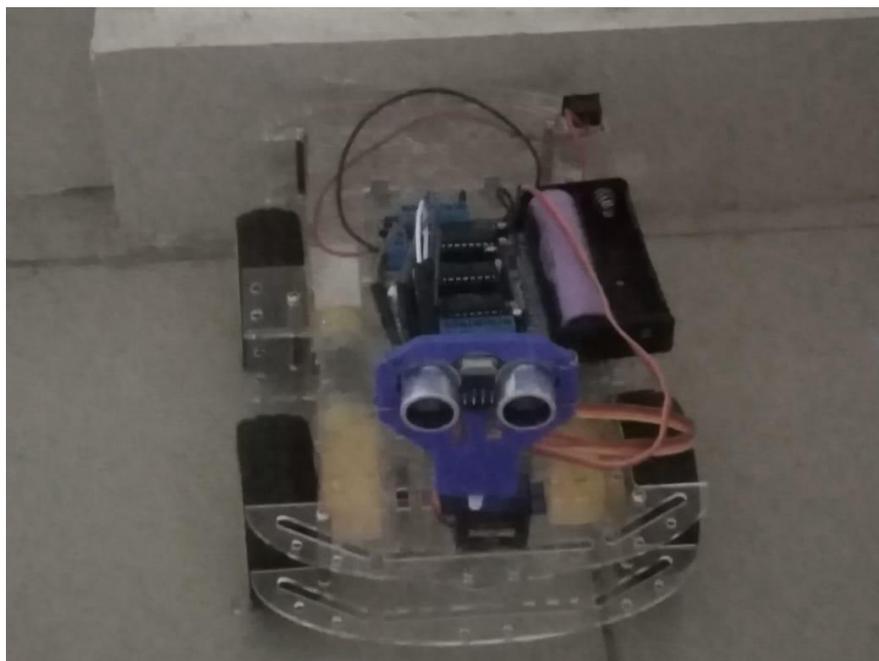
Another issue is the unctrollable condition that if a person gets sleepy during the driving it can also cause collisions with nearby objects.



### 3. Solution

This project will solve the problems describe above in the issue. While the vehicle is moving on the road. The sensor will be active all the time to detect any obstacle coming in its way. When obstacle is detected the ultrasonic sensor attached at the front of the car will send the

signal to the main board. The signals will be sent to through H- bridge to change the direction of the wheels.



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#### 4. Method

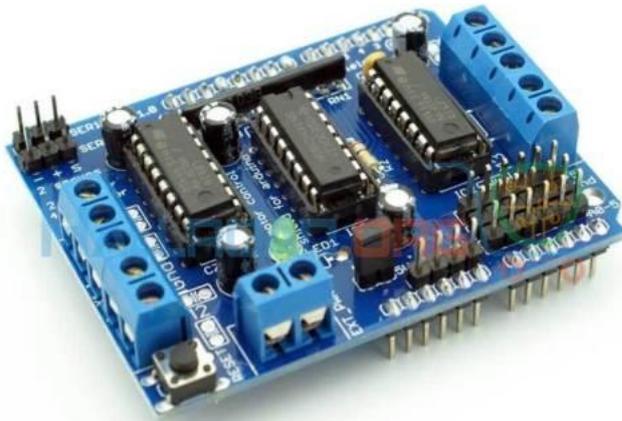
In our prototype we are using HC-SR04 ultrasonic sensor which is mounted on the top and at the front on tower pro for rotating the sensor as it needs to detect the obstacle.



This sensor sends ultrasonic waves in the air and when these waves are hit by the object. These waves are sent back to the ultrasonic receiver module [1]. The signals are sent to the Arduino Uno which is a microcontroller board and has 14 digital input and output. The coding is through



the software which will execute the input and generate the output to control the wheels [2] The L293D is a dual H-Bridge motor follows the instruction given by the arduino and control the speed and direction of the 4 DC motors [3]



5 V DC Motors are used to control the wheels [4].



All these components are mounted on chassis with four wheels on the side.



[www.e-pro.pk](http://www.e-pro.pk)

The experiment with the prototype was done and observed that as the vehicle detected the obstacle it moved in the right side direction and detected until there was no obstacle in its path and continue the moving forward.

### 5. Innovative Aspect

The innovative aspect of our project is that it is very cheap. The components are easily available in the market. The software is easy to handle and to update..

## 6. Applicability

On larger scale this project can be implemented on the regular cars we drive in everyday life. This idea can be embedded within the cars.

## 7. Estimated cost and Project Scheduling

The components used in making prototype are described below with cost

Arduino Uno (1) = 3.98 \$

Tower pro (1) = 4.23 \$

HC-SR04 Ultrasonic Sensor.(1) = 0.86 \$

L293D Motor Driver Module.(1) = 2.14 \$

Chassis.(2) with 5V DC Motors.(4) = 6.74 \$

3200 mAh Battery.(2) = 3.06 \$

Jumper Wires.(4) = 1 \$

Total = 22.01 \$

This is an extremely low cost project

## 8. Target Group of the Project Idea (Users):

Any person, ambulances, civilians and crime control cars can use this idea as it is very helpful and control accidents.

## 9. Risks

If the height of the obstacle is smaller than the place where the sensor is attached then the sensor will not be able to detect it and it can cause damage to the wheels. The sensor movement can be jammed.

## 10. Project Team

Name Surname	Mission In The Project	School	Project or problem related experience
Asim Rizwan	Planning , Designing	Pak Turk Maarif Int`l Nil Schools and Colleges, Islampura Lahore.	
Sadia Ejaz	Consultation	Pak Turk Maarif Int`l Nil Schools and Colleges, Islampura Lahore.	

## 11. Resources

1. <https://components101.com/ultrasonic-sensor-working-pinout-datasheet>
2. <https://store.arduino.cc/usa/arduino-uno-rev3>
3. <https://howtomechatronics.com/tutorials/arduino/arduino-dc-motor-control-tutorial-1298n-pwm-h-bridge/#:~:text=The%20L298N%20is%20a%20dual,and%20explain%20how%20it%20works.>
4. [https://www.google.com/search?q=5v+dc+motors&rlz=1C1CHBF\\_enPK842PK842&oq=5V+DC+Motors&aqs=chrome.0.0l8.1351j0j8&sourceid=chrome&ie=UTF-8](https://www.google.com/search?q=5v+dc+motors&rlz=1C1CHBF_enPK842PK842&oq=5V+DC+Motors&aqs=chrome.0.0l8.1351j0j8&sourceid=chrome&ie=UTF-8)
5. [https://www.google.com/search?q=Chassis&rlz=1C1CHBF\\_enPK842PK842&oq=Chassis&aqs=chrome..69i57j0l7.1635j0j8&sourceid=chrome&ie=UTF-8](https://www.google.com/search?q=Chassis&rlz=1C1CHBF_enPK842PK842&oq=Chassis&aqs=chrome..69i57j0l7.1635j0j8&sourceid=chrome&ie=UTF-8)

