

Microprocessors, Microcontrollers and Assembly Language
Project Proposal on
Obstacle Avoidance Voice Instructed Robot with Arduino

Group – 2

Level – 3 (Section A)

Group members

Abrar Mahir Esam – 202114003

Humayra Akter – 202114026

Mayesha Tasnim – 202114041

Course code: CSE-306

Date: 18 April, 2023

Project description

The robot is assembled in a 4-wheel chassis consisting of two geared drive motors. The circuitry is assembled with a power supply. The Arduino UNO cannot drive the motors directly due to much higher current requirement for the motors. Therefore, the L293D motor driver shield is used. The PWM signals from the Arduino UNO is used to control the speed of the.

The core features of the robot are elaborated bellow:

- **Obstacle Avoidance**

Programmed to automatically detect obstacles in its way and redirect its path to avoid crashing onto them. In robotics, obstacle avoidance is the task of satisfying some control objective subject to non-intersection or non-collision position constraints. IR sensors are widely used for measuring distances, so they can be used for obstacles avoidance. Although IR sensors are faster in response time than ultrasonic sensors, ultrasonic sensors are a better alternative for small devices with relatively slower speed.

Arduino has been used as the core control device of the system. Automatic response signals (that are codified via IDE software into Arduino chip) are generated without any external inputs. The system is well placed and designed to automatically move around, avoid objects in its way

- **Voice instruction**

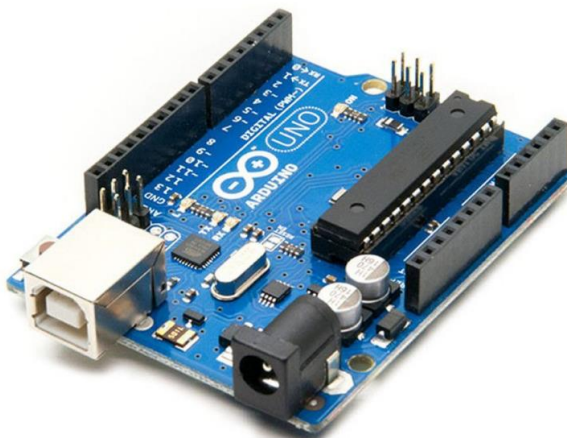
The project uses a mobile phone to communicate with a robot via Bluetooth. The robot senses Bluetooth signals transmitted from the mobile phone. It uses the HC-05 Bluetooth module to sense the command signals and controls the robot. We used the Arduino Bluetooth Control app to control the robot. The heart of the robot is the Arduino UNO. It receives the signals from the HC-05 module via serial communication and controls the motors via the motor driver shield for motion in forward, left and right directions and to stop.

Components and Budget Details

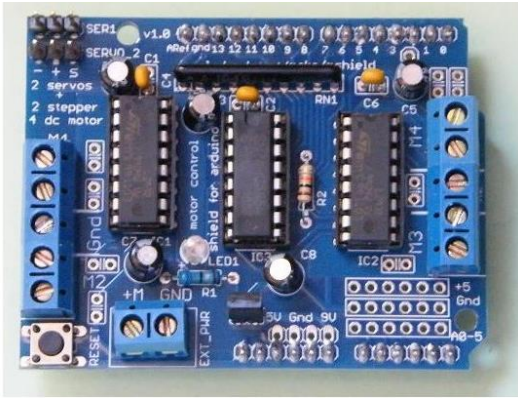
Serial	Component Name	Quantity	Total cost
1	4-wheel robot car chassis	1	735/-
2	Arduino UNO	1	860/-
3	L293D Motor Driver Shield	1	210/-
4	Servo Motor	1	138/-
5	Ultrasonic Sensor	1	90/-
6	HC05 Bluetooth Module	1	265/-
		Total	2298/-



4-wheel robot car chassis



Arduino UNO



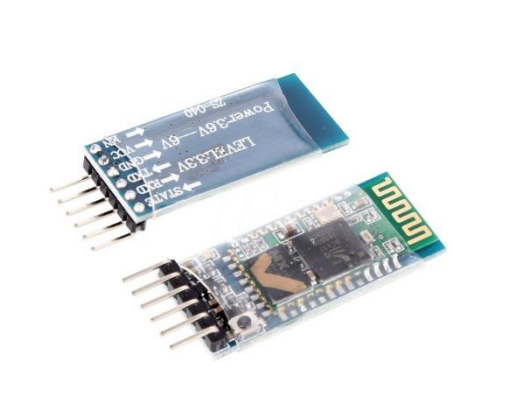
#L293D Motor Driver Shield



#Servo Motor



#Ultrasonic Sensor



#HC05 Bluetooth Module