Group 5:
Progress
Report 1
ECE 511

OBSTACLE DETECTION AND AVOIDANCE ROBOT

Yasaswi Garimella,
Pravalika Reddy,
Sirisha Kurakula.

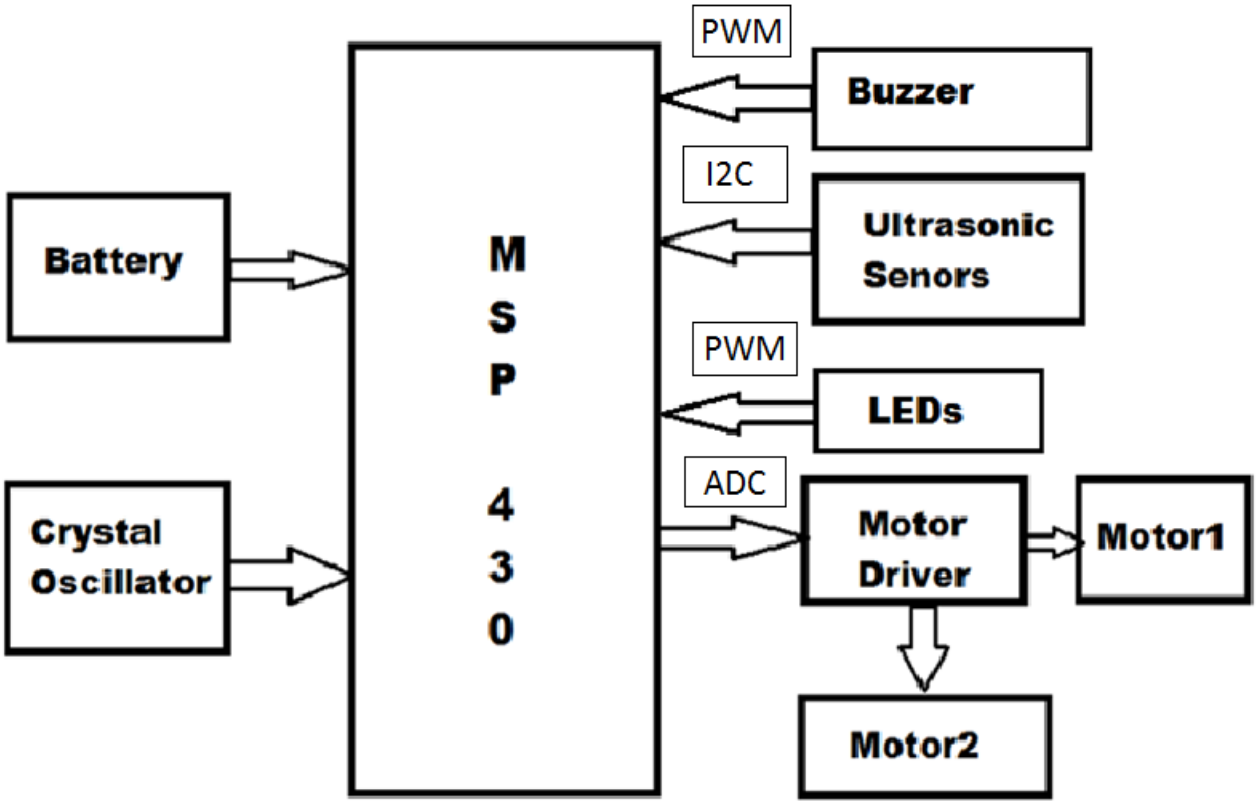
OVERVIEW

OBSTACLE DETECTION AND AVOIDANCE ROBOT

OBSTACLE DETECTION AND AVOIDANCE ROBOT

- Major Components:
  - Hardware:
    - Microcontroller MSP430.
    - Ultrasonic sensors.
    - DC motors and L293D (Dual H-Bridge Motor Driver).
    - Light Emitting Diodes (LEDs).
    - Buzzer.
  - Software:
    - Code Composer Studio.

BLOCK DIAGRAM



OVERALL PROGRESS

- Ordered Components
  - L293D H-Bridge Motor
  - MSP 430
  - Ultrasonic Sensors
  - DC Motors
- Received Components
  - Buzzer
  - LEDs

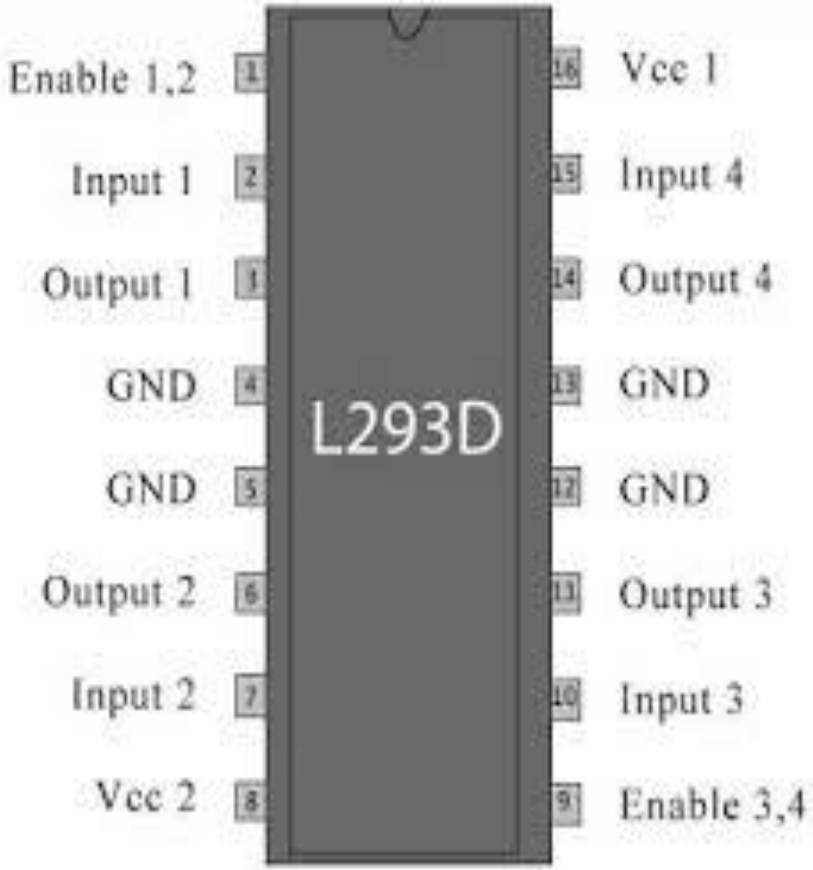
ULTRASONIC SENSOR

- Ultra sonic sensors are used for detecting the obstacle.
- Active ultrasonic sensors generate high frequency sound waves. They go and hit the obstacle and the echo is received by the sensor.
- The time interval between sending the signal and receiving the echo is used in measuring the distance of the obstacle.
- Interfacing: Uses I2C protocol. (Serial communication)

MOTOR

- Motor is interfaced with MSP 430 through H bridge(L293D).
- The speed of the motor depends upon the input of ultra sonic sensor.

H-BRIDGE(L293D)



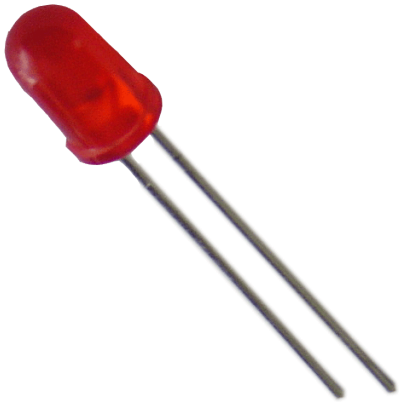
- We use IC L293D for moving left and right.
- Supply voltage is 4.5v to 36v.
- Interfacing: Motors are connected to H bridge(Motor driver) and then to microcontroller to the Digital I/O pins.

BUZZER

- It is an Audio Signaling device.
- Generally buzzers are of 3 types :
  - Mechanical
  - Electromechanical
  - Piezoelectric
- Interfacing:
  - It has 2 pins: One pin is connected to the Square wave coming out from the microcontroller and the other pin is connected to the ground.

LIGHT-EMITTING DIODE (LED)

- It is a simple pn-junction diode and a semi conductor light source.
- When it is activated it emits light.
- It uses 3.3-5 volts.
- Types of LEDs are:
  - Simple Glowing LED
  - Bi color
  - Tri color
  - Decorative multi color
  - Alphanumeric
- Interfacing: They are connected to the digital I/O pins of the microcontroller.



TASKS TO BE PERFORMED

- Debugging of each component once it has arrived.
- Interfacing the buzzer and LED.
- Bringing all together for testing.
- If time permits, we will create PCB for final device.

TASK DIVISION

- Pravalika Reddy: Hardware Interfacing
- Sirisha Kurakula: Software Interfacing
- Yasaswi Garimella: Testing and debugging

ALTERNATE PLAN

- If we face any problems with PWM in buzzer, then we will go for simple on and off buzzer.
- Same with Motor. If we will face trouble in controlling the speed then we will go with simple on and off motor.

THANK YOU !!!