

ECE 511, Microprocessors
Group 4
Project Proposal

TITLE: Obstacle Detection with Bluetooth controlled vehicle motion

GOAL:

The goal of our project is to control a car whose operation is based on hand motion and to detect obstacles within a particular range. The accelerometer is attached to the user's hand which decides the direction of the movement of the car. The communication between the accelerometer and the car is ensured by using a Bluetooth module. An ultrasonic sensor is interfaced to the MSP 430 which would sense the obstacle in front of the vehicle. This setup allows the user to have a better control over the car as it is operated through movement of the hand.

Features:

The idea behind using hand gestures is to remove the use of remote controllers.

The different stages of the project will be:

1. To interface the accelerometer with the MSP1 which translates the gestures into Bluetooth signals.
2. To interface a H-Bridge with MSP2 which receives the Bluetooth signals and runs the motors of the car.
3. A Bluetooth module is used to ensure communication between the two MSPs, so that the hand gestures get converted to motor directions.
4. An ultrasonic sensor is used as an obstacle detector which would detect obstacles in its path and the H-bridge would slow down the motors of the car such that, it would not collide with obstacles.

Components:

- 2 MSP430FR6989
- Accelerometer module (ADXL 335)
- Motor driver IC (L293D)
- Ultrasonic Sensor (SRF 05)
- 2 Bluetooth module (CC2560)
- H-bridge
- LED

Modules used in MSP:

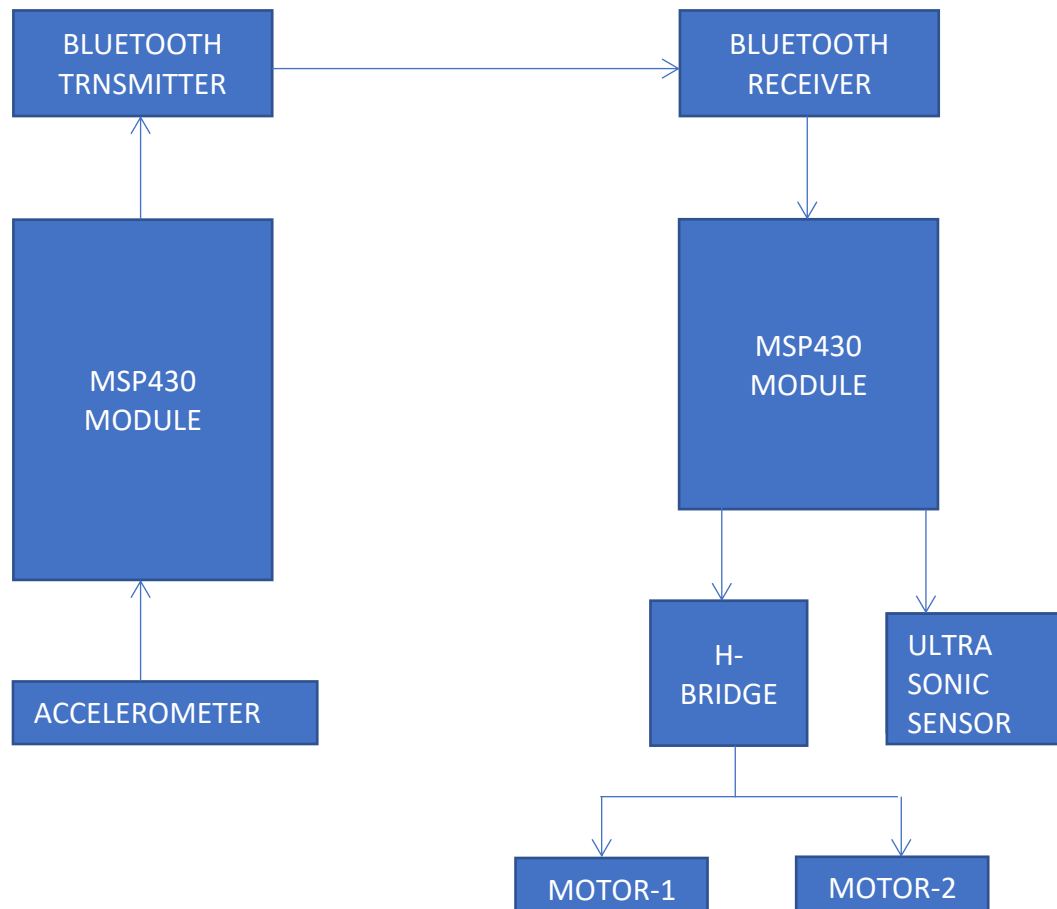
- Bluetooth module is interfaced to the microcontroller using UART pins of the MSP.
- Timer pins of the MSP will drive H-bridge.
- General Purpose pins of the MSP would be connected to LEDs to indicate proper working of each component.
- The ultrasonic sensor would be interfaced to the general purpose pins as well.

Division of Task:

Microcontroller programming – Aishwarya and Priya

Hardware interfacing – Sasank Das and Rohit

Block Diagram



References:

- MSP 430 datasheet
(<http://www.ti.com/lit/ds/symlink/msp430g2253.pdf>)
- Bluetooth module datasheet
(http://www.ti.com/pdfs/wtbu/cc2560_slyt377.pdf)
- Accelerometer data sheet
(http://www.analog.com/static/importedfiles/data_sheets/ADXL335.pdf)
- Motor driver IC datasheet
(<http://www.alldatasheet.com/datasheetpdf/pdf/245718/FAIRCHILD/LM78XX.html>)
- Ultrasonic sensor datasheet.
(<http://www.picaxe.com/docs/srf005.pdf>)