

A.U.R.A.S

Autonomous Ultrasonic Robot for Area Scanning

Project Progress Report 1

ECE 511

Fall 2014

George Mason University

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Group: 2

Team Members:

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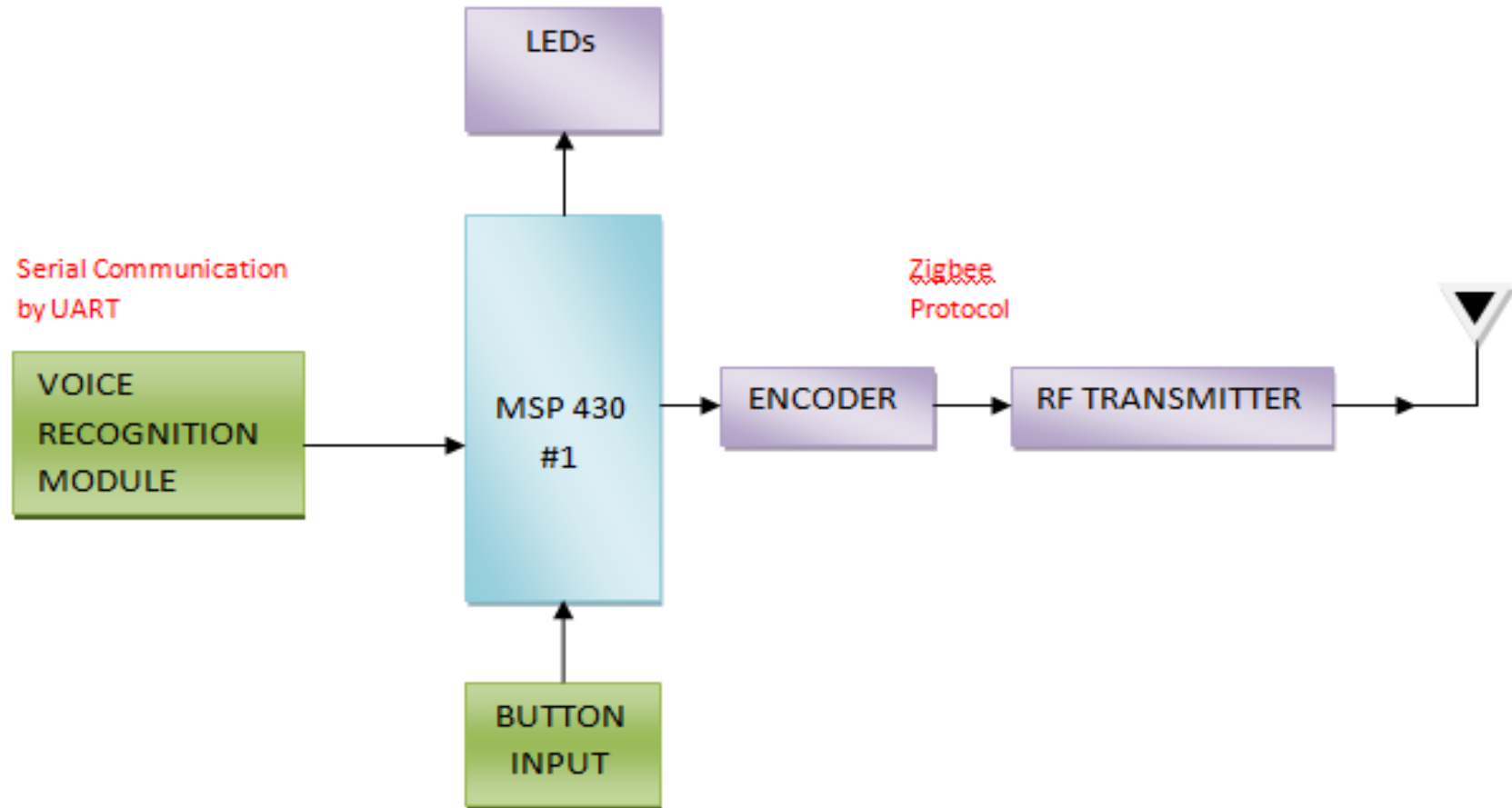
Gagandeep Singh Bamrah

Ankita Pandey

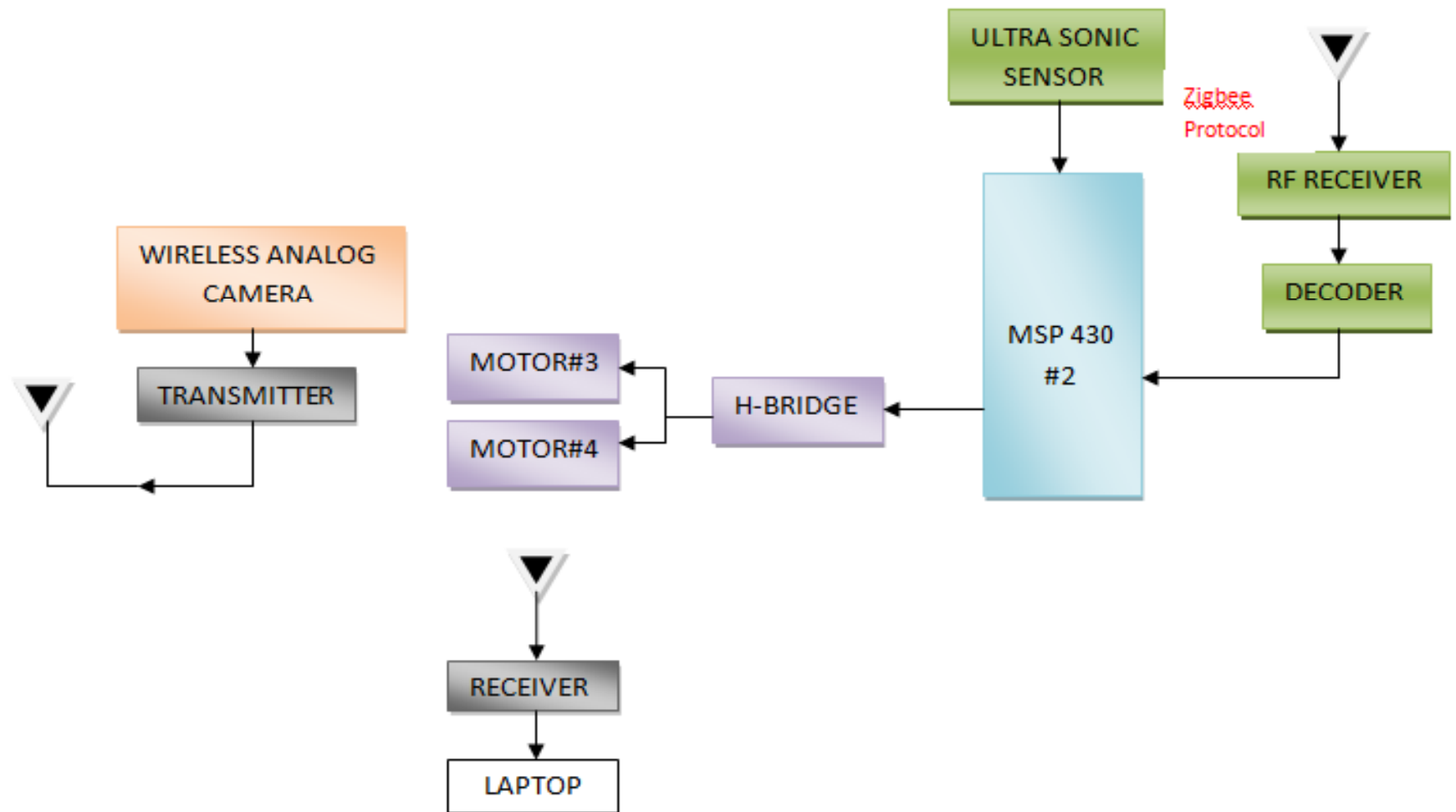
Major Features

- Ability to avoid obstacles using ultrasonic sensors
- Ability to operate in manual as well as autonomous mode
- Ability to provide surveillance and act as a first response unit
- Ability to accept voice commands wirelessly

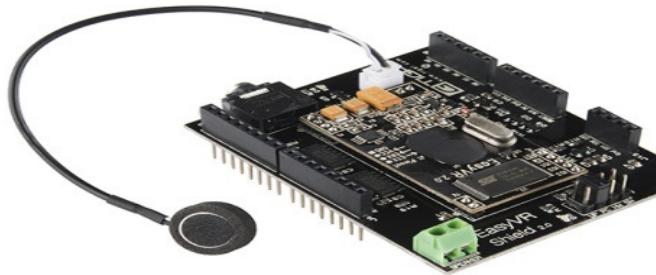
Block Diagram1(Handheld Controller)



Block Diagram 1(A.U.R.A.S)



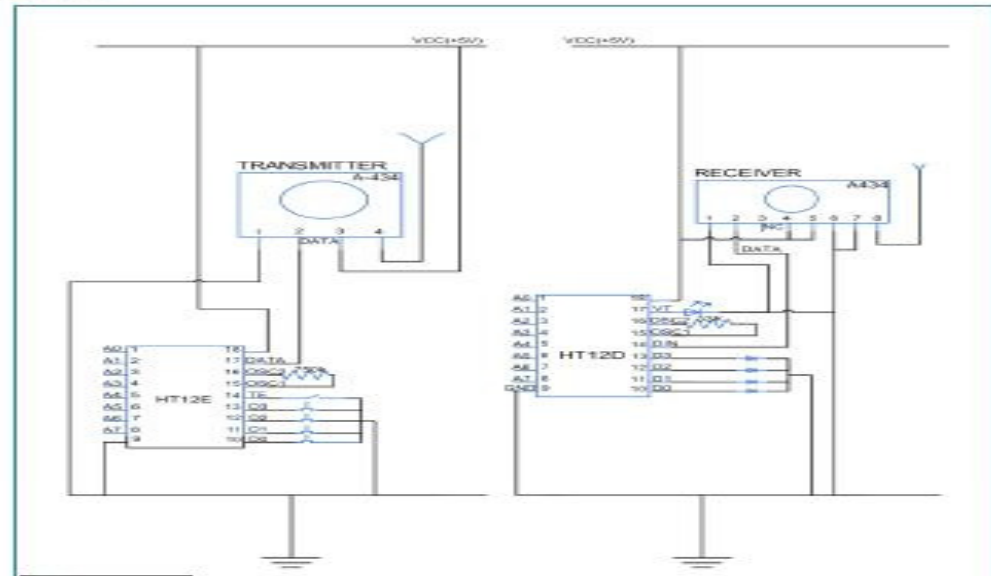
Major Components (1)



Easy VR Speech Recognition Module v2.0

- Module can be used with any host with an UART interface (powered at 3.3V - 5V) .

Circuit Diagram



Transmitter Receiver Schematic

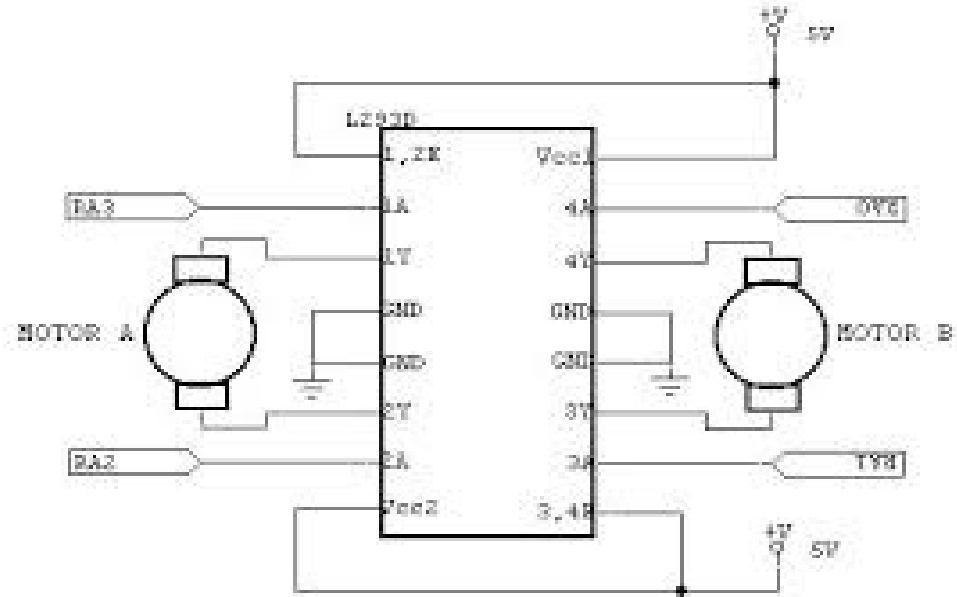
- Frequency: 315Mhz.
- Modulation: ASK
- Receiver Data Output: High - $1/2 V_{cc}$, Low - 0.7v
- Transmitter Input Voltage: 3-12V
(high voltage = more transmitting power)
- HT12E (Encoder) and HT12D(Decoder) are added to make sure other RF links in the range do not interfere with our signals
- Interfaced to MSP430 using I2C

Major Components (2)



Electronic Motor

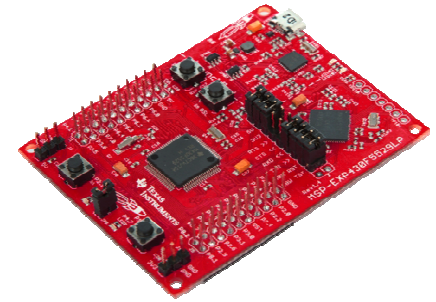
- 12 Volts DC
- 100 RPM
- Torque: 90 N*cm
- It will be used as a rear wheel drive



H-Bridge Interfacing for Motor

- 600mA output Current Capability per channel
- 1.2 A Peak Output current per channel
- Logical “0” input voltage up to 1.5V

Major Components (3)



Push Buttons

- Momentary Tactile Tact Push
- Bouncing: max 3ms on ,8ms off
- Voltage 5V

HC-SR04 Ranging Detector Mod Distance Sensor

- There are 4 pins out of the module: VCC , Trig, Echo, GND
- Power supply :5V DC,
- Ranging distance : 2cm~500 cm
- Resolution: 0.3 cm

The Module automatically sends eight 40 kHz and detect whether there is a pulse signal back

MSP430 Microcontroller

- 25MHz
- 128KB Flash
- 8kB RAM
- 16ch 12-bit ADC
- Comparator
- 4 16-bit Timers
- Up to 2 I2C, 4 SPI, 2 UART

The Game Plan

Task Division:

Devaraj :	Interfacing voice recognition module with MSP430
Ankita:	Interfacing RF link module with MSP430
Gagandeep:	Interfacing H-bridge and motors with MSP430
Nikhila:	Interfacing Ultrasonic sensors with MSP430

Project Status

Input Control:	Ordered and received push buttons , LED's. Ordered Voice recognition module
Motors:	Ordered and received Motors and H-bridge
Sensing and Detection :	Ordered and received Ultrasonic Sensors

Thank You