

ECE 511 Project Proposal

Title:

Rear Distance Detection System with Ultrasonic Sensors

Team Members:

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Goals:

- Use ultrasonic sensors to recognize distance between the rear of a car and an object
- Display the measured distance to the driver on an LCD
- Progressively alarm the driver as the object gets closer with an LED and a piezo-speaker

Description:

In order to allow a driver to park safely and avoid collisions with other objects, we use an MSP430 with three ultrasonic sensors to report the distance of approaching objects. As an object moves closer to the car, the LED will begin to flash yellow and the speaker will beep at a faster rate. When an object is closer than safe distance to the car, the LED will stay on red and the speaker will beep continuously. The LCD will also display the word “STOP” for the driver to see. Each of the components listed in the next section will be directly interfaced with the MSP430 using the available general purpose input/output (GPIO) ports. An internal timer will be used as an interrupt to update the state of the LED, LCD and speakers. Input from the ultrasonic sensors will be polled every tenth second from the GPIO ports.

Hardware Components:

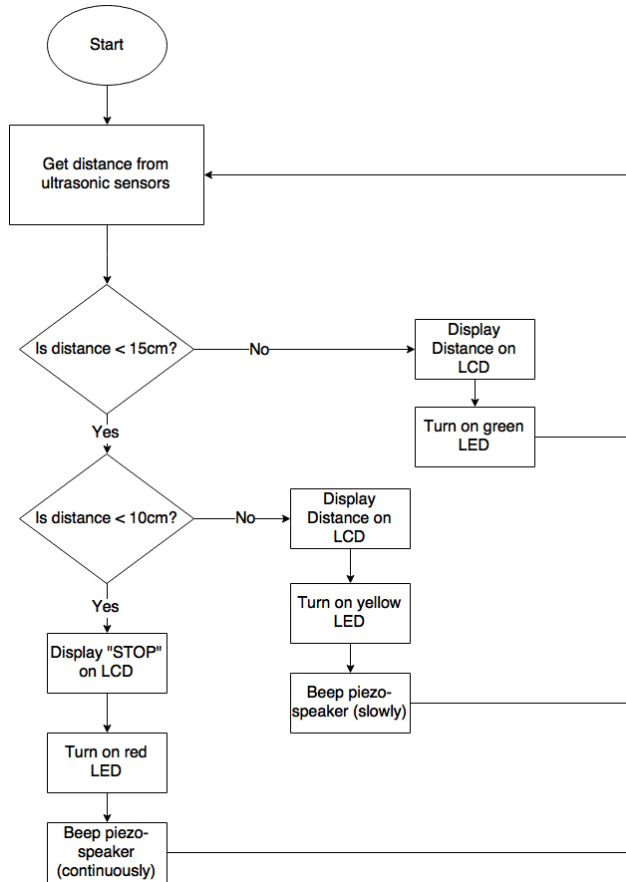
- MSP430FR6989 Launchpad (1)
- RGB LED (1)
- Ultrasonic Sensors (3)
- Piezo-Speaker (1)
- MSP430's LCD Display (1)

MSP430 Features Utilized:

- Internal Timer (LCD, LED and Speaker Updates)

- General Purpose Input/Output Pins (Input Monitoring from External Hardware)
- LCD Display (Distance Updates to Driver)

Program Flow Chart:



Block Diagram:

