**UCR CS 122A Fall 2016**

**RC Bluetooth Auto Drive Car**

**High Level Description:**

This custom lab is a bluetooth remote controlled car with a obstacle detection mode. The vehicle will be able to be controlled by the user through an Android bluetooth serial transmitter phone app which the user will have to download through google play. The vehicle also has an auto drive mode in which it will detect oncoming obstacles using an ultrasonic sensor. The distance of the oncoming obstacle will be displayed in hex values on the LED bar located at the center of the car.

**User Guide:**

* Download a bluetooth transmitting application from google play on your Android phone.
* Configure the values sent through the transmitter accordingly to the values received by the vehicle.
* Upon the LCD screen, select the mode you want the vehicle to be in.
  + The top button is for scrolling through the options.
  + The middle button is for selecting the mode you want.
  + The bottom button is for resetting the car back into its original “inactive” mode.
* If RC mode is selected, use the connected phone to control the vehicle.
* If AUTO mode is selected, the vehicle will begin to drive forward until an obstacle is detected.

*NOTE:*

In AUTO mode, because of the skewed position of the ultrasonic sensor, there are times where an incoming obstacle may be missed therefore causing a slight collision. When this happens, either wait for the car to backup or physically reset the car in position.

**Technologies and Components:**

2x ATmega1284, HC-06 Bluetooth Module, HC-SR04 Ultrasonic Sensor, 2x L293D Motor Drivers,

4x DC Motors, 8-bit LCD, 3x buttons, LED Bus, 4x AA Batteries, Portable Battery Pack, AVR Studio 6.1

**Link to Demo Video:**

[**https://www.youtube.com/watch?v=6nuU5UxcJmA**](https://www.youtube.com/watch?v=6nuU5UxcJmA)

**Source Files:**

* All of the source files included in FreeRTOS\_lab (look under src folder)
* CS122A\_Final\_Project.c - C code for microcontroller 1 of vehicle
* CS122A\_Final\_Project\_P2.c - C code for microcontroller 2 of vehicle
* usart\_ATmega1284.h - C code to enable USART in both microcontrollers
* io.c/io.h - C code to enable LCD screen and display characters

**Sources:**

* IEEE
* UCR CS122A LAB
* ATmega1284P Datasheet