CS/EE 120B Custom Laboratory Project Proposal
Controlled Sweeping Ultra Sonic Distance Monitor
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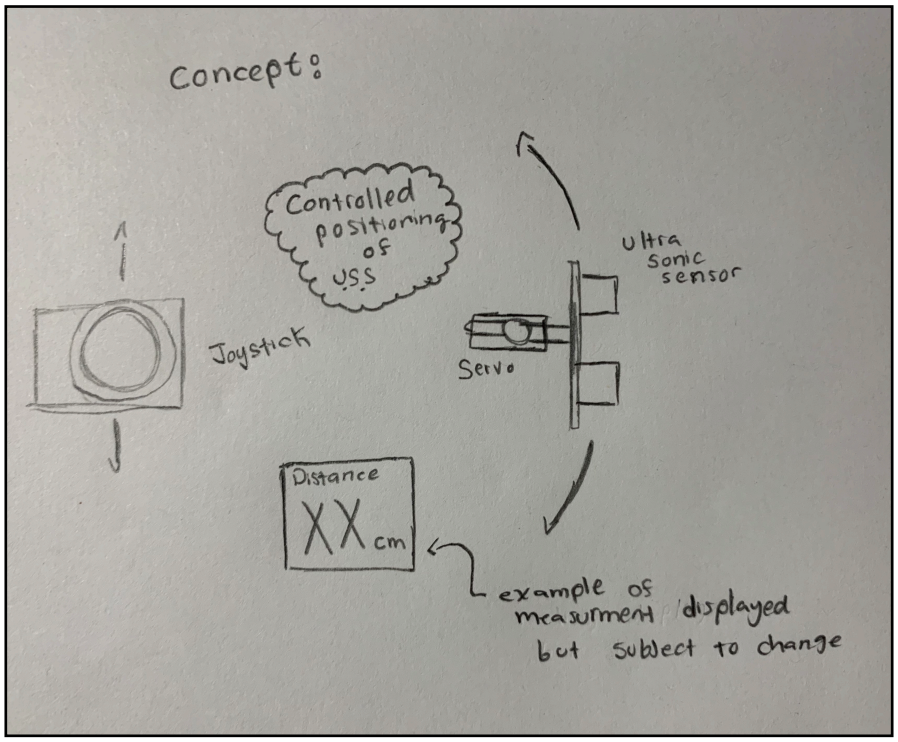
Introduction

The ultra sonic scanner will serve the purpose of providing reliable distance measurements for the distances between the ultrasonic sensor itself and objects within its scanning range. The ultrasonic sensor will be attached onto a servo, which will provide the sensor with an idealistic sweeping angle of 180 degrees. The motion of the servo will be controlled with a joystick, and the distance measured will be displayed onto a Nokia 5110 LCD display for legibility.



Hardware Components

- Elegoo Uno R3 Microcontroller (provided in kit)
- Super Sonic Sensor (provided in kit)
- Servo motor (provided in kit)
- Joystick (provided in kit)
- Nokia 5110 LCD (will purchase)
- Bread Board and Wires (provided in kit)

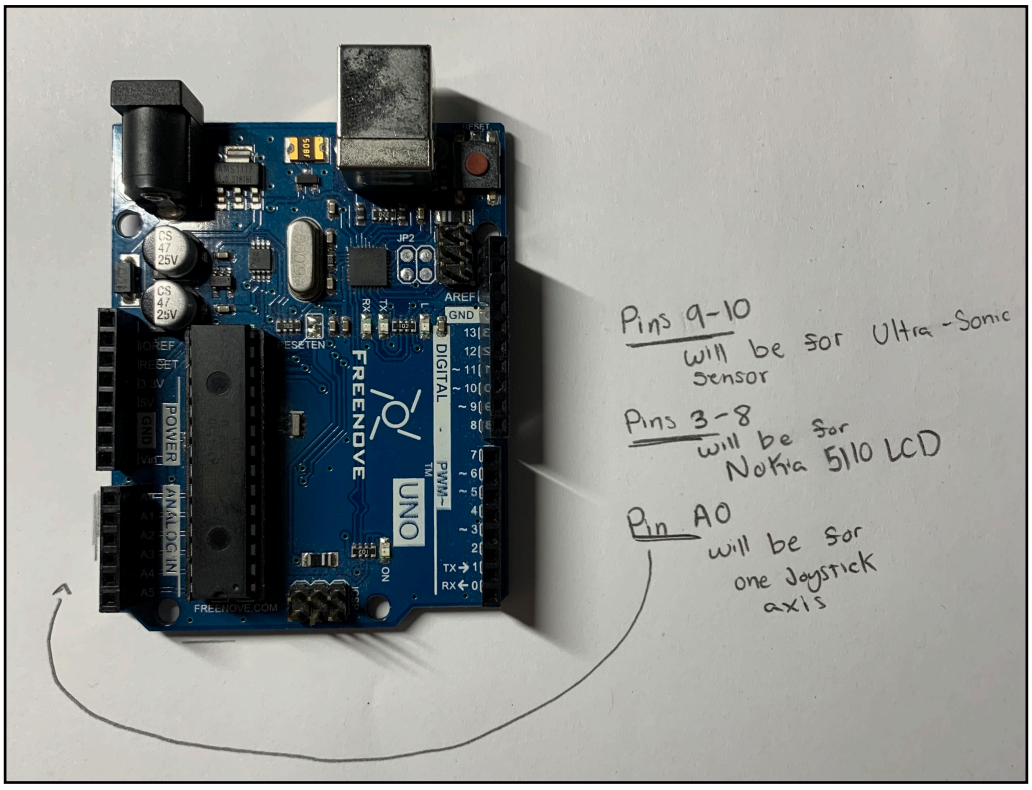
Computing

- Elegoo Uno R3 Microcontroller

Inputs

- Super Sonic Sensor
  - Responsible for measuring distance
- Joystick
  - Will provide input to guide the servo as to where the Ultra Sonic Sensor should be facing

Outputs
- Servo motor
  - Responsible for sweeping motions of sensor
- Nokia 5110 LCD
  - Will be used to display distances



Functionality
The purpose of this devices is to provide to the user the distance measured form the position of the Ultra Sonic Sensor, and possible objects which may be in the direction and the range the sensor is facing at a given time.

As long as there isn't an input from the user, which would be done by utilizing the joystick, the sensor will be performing a sweeping motion with the aid of the servo. If in the case the joystick is providing a non-resting position sigal, the servo motor will move towards the direction indicated by the input signal. Once an input signal is not received within a given amount of time, the sensor will restart its sweeping motion.

The current measured distance will be shown to the user by displaying it to the Nokia 5110 LCD display.

Complexities:

1.Ultra Sonic Sensor to measure distance.
2.Joystick to provide input of desired pointing direction.
3.Nokia 5110 LCD to display measured values of distance to the user.