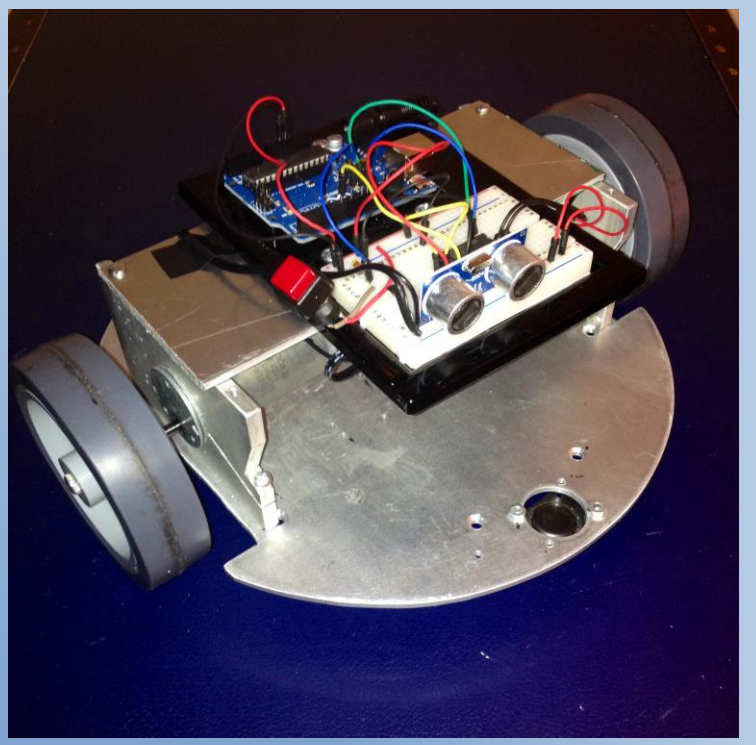
Setup Procedure

To setup LUCI, perform the following steps:

1. Turn on the power by plugging the Arduino into a USB port.
2. Plug in the 9V battery into the correct portion of the breadboard.
3. Open the final project code in Arduino and upload to LUCI via the COM7 Port.
4. Open Arduino Serial Monitor.
5. Place LUCI where she can turn in a complete circle to take readings.

Operational Procedure

1. Once the code is correctly uploaded, the user will push the red button to start the program.
2. After the red button has been pushed once, there is a delay of one second so that the user can get out of the way before the code executes.
3. LUCI will turn in a complete 360° circle. LUCI will store 44 distance readings into EEPROM memory.
4. Once the circle is finished, the user will press the red button again to upload the data to the Serial Monitor.
5. The user will then copy and paste the data into our MATLAB program to graph the data.
6. A screen will come up with the plotted data of how LUCI sees everything at a certain distance.



Documentation Statement:

Ultrasonic code referenced from
http://www.arduino.cc/en/Tutorial/Ping
The official Arduino Reference page for basic hardware and syntax.
http://subinsebastien.tumblr.com for wiring the motor chip

Parts List:

1. One Arduino Uno with an Additional Breadboard
2. 2 12V DC Motors
3. Metal plate for body
4. 2 wheels
5. 1 Ultrasonic Sensor
6. 1 10kΩ resistor
7. One Push Button
8. Various Wires

L.U.C.I.

Landbased

Ultrasonic

Communications

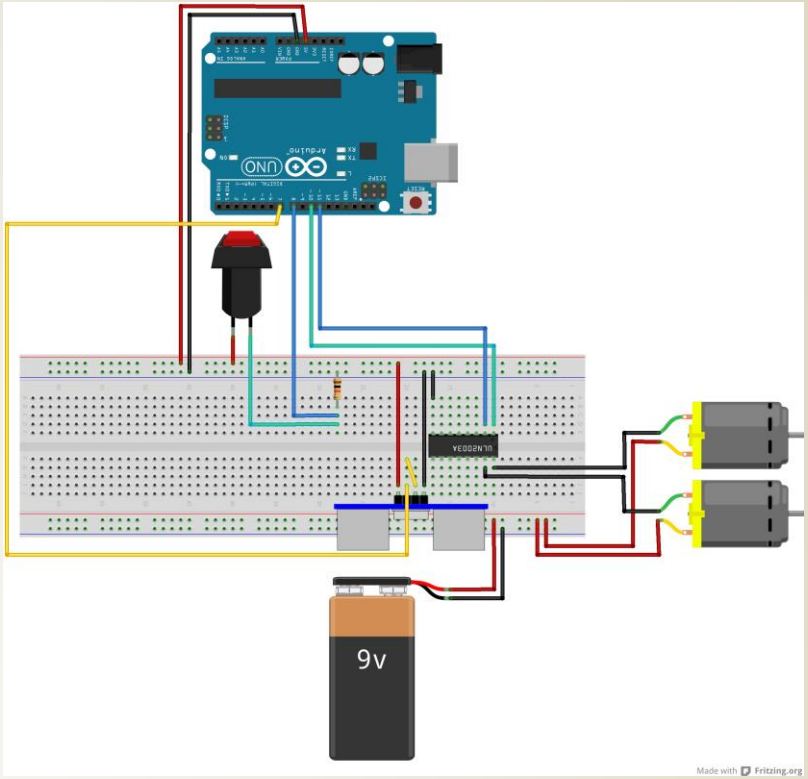
Interface

360° Room Mapping

C3C Nathan Ruprecht, C3C Brian Yarbrough

Project Specifications:

- *Uses techniques of software/hardware integration to allow for 360° mapping*
- *Turns in a complete circle*
- *Takes readings from ultrasonic sensor*
- *Saves readings*
- *Displays the readings in Matlab with the reading number on the x-axis and distance on the y-axis*



Above: A graphical representation of LUCI was created using Fritzing, a software program that allows the user to create electronic project designs in a software environment that looks similar to the picture. Fritzing will then automatically route the connections to create a traditional schematic showing the wiring connections for the project (see figure to right).

The figure above shows the components and connections for the project. Colored lines represent wired connections.

Some parts used in the actual project, such as the motors which were acquired already attached to the metal body. The placement of the components on the breadboard (resistor, sensor, and ULN chip) are exactly the same as on LUCI, but the other parts (battery, button, motors) are placed differently than reality to make the design easier to follow.

Arduino Pin Descriptions:

Analog

Pin 0 – Not Connected
Pin 1 – Not Connected
Pin 2 – Not Connected
Pin 3 – Not Connected
Pin 4 – Not Connected
Pin 5 – Not Connected

Power

5V pin – Power Breadboard
Ground pin – Power Breadboard
9V battery – Power Motors

Digital

Pin 0 – Not Connected
Pin 1 – Not Connected
Pin 2 – Not Connected
Pin 3 – Not Connected
Pin 4 – Not Connected
Pin 5 – Not Connected
Pin 6 – Not Connected
Pin 7 – To Ultrasonic Sensor
Pin 8 – To Button
Pin 9 – Not Connected
Pin 10 – To ULN2003A (Right Motor)
Pin 11 – To ULN2003A (Left Motor)
Pin 12 – Not Connected
Pin 13 – Not Connected

Below: This is a traditional wiring schematic showing the connections.