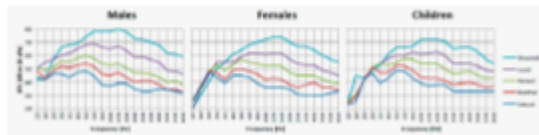
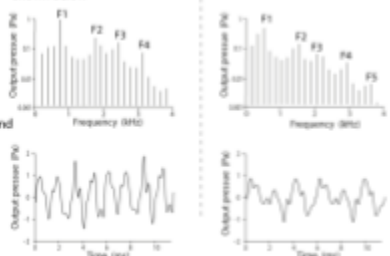


Unique Human Voice and Harmonic Frequencies Similar To Fingerprints



In a linear system the output sounds are the product of the source function and the filter function and will have the pressure spectra and waveforms shown below

OUTPUT SOUND

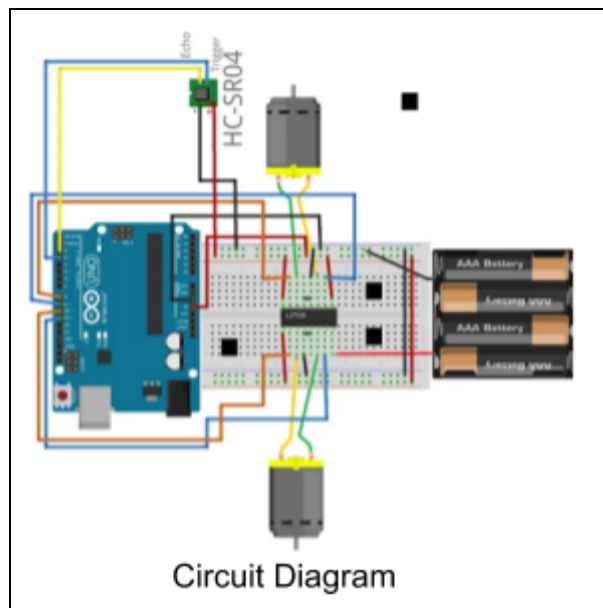


Bluetooth Module Testing

Trial	Successful Connection Between Android Device and Bluetooth Module	Connection Time (Seconds)	Observations
First Trial	No	N/A	The tablet was unable to connect with the Bluetooth Module.
Second Trial	No	N/A	The bluetooth module was not connecting to the tablet. The module was replaced.
Third Trial	Yes	0.0737	After replacing the module, the tablet and Bluetooth module were able to connect.
Fourth Trial	Yes	0.0530	The module is consistently connecting to the tablet.
Fifth Trial	Yes	0.0320	After replacing the Bluetooth module, it is able to connect with the tablet.

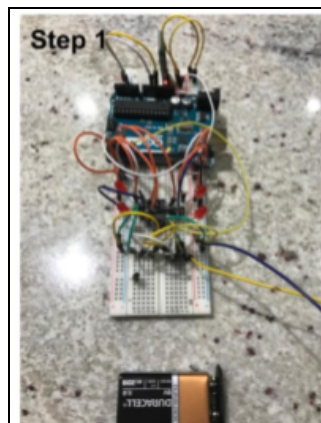
Performance Analysis

Trial	Robot Acknowledgement Time to the commands (Seconds)	Robot Rotation
First	1.879	90 degrees
Second	1.038	0 degrees
Third	1.709	180 degrees
Fourth	1.022	-90 degrees
Average	1.412	



Voice Command Testing

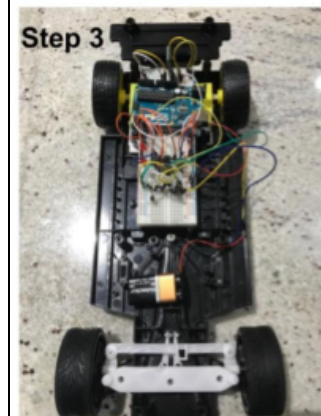
Iteration	Results	Observations
Command 1- 'Go' (Robot in forward motion)		
First Iteration	No	Neither of the wheels functioned
Second Iteration	No	Wheels were rotating in different directions
Third Iteration	Yes	Both wheels worked properly
Fourth Iteration	Yes	Function verified
Command 2- 'Back' (Robot in backward motion)		
First Iteration	No	Robot moved forward instead of backward
Second Iteration	No	Neither wheels turned
Third Iteration	Yes	Both wheels operated properly
Fourth Iteration	Yes	The command function has been verified.
Command 3- 'Right' (Robot turns right)		
First Iteration	No	Robot did not respond
Second Iteration	No	Robot did not respond
Third Iteration	No	Software debugged and reloaded
Multiple other iterations	No	Troubleshooted circuit
Second last Iteration	Yes	Both wheels followed the command properly
Last iteration	Yes	Function Verified
Command 4- 'Left' (Robot turns left)		
First Iteration	Yes	Robot responded to the command
Second Iteration	No	Left motor died
Third Iteration	No	Motor troubleshooted and replaced
Fourth Iteration	Yes	Robot followed the function commanded.
Fifth Iteration	Yes	Both wheels worked properly



Basic Circuit with LED Testing



Motor and Wheels installed in the frame



Circuit connected with Motors



Completely Assembled Robot