

EE 491: Wireless Recharging System

Client: National Carwash Solutions

**Weekly Report #7
10/29/18 - 11/2/18**

Team:

**Benjamin Gisler
Miguel Hennemann
Kyle Henricksen
Doruk Er**

Faculty Advisor: Craig Rupp

Weekly Summary:

We received the parts we had ordered and have finally begun putting together the components to test the various mechanics of the re-charging system. We set up 2 different testing circuits. The first circuit was the H-bridge circuit connected with the gate driver IC. The second circuit was just the function generator connected to the transmitter coil, where we placed the receiver coil at different distances apart from it and hooked up an oscilloscope to the output. We got to see the waveform that was transferred wirelessly between the transmitter and receiver. Seeing the primary function of our project was very exciting. We also updated our design schematic based on new components we have added. We've also caught up on Status Reports and should be able to keep them consistent from here on out.

Past Week Accomplishments:

Name	Accomplishments
Miguel Hennemann	I found out that a gate driver IC is required for the design that we have. Ordered all necessary components required for the design of our prototype.
Benjamin Gisler	Prepared solder, Flux and soldering iron for use in assembling our prototype.
Kyle Henricksen	Taught group how to update the website through basic principles of web design, and worked on the Design Document, Algorithm was refactored.
Doruk Er	Found multiple candidates of buck/boost converters for the rectification side of our system. Learned about frequency effects on coil's resonance range. Achieved a different perspective on H-bridge usage for alternative test cases.

Pending Issues:

Name	Issues
Miguel Hennemann	Although we have all the necessary components for our project, we are having trouble getting it to function as expected. We are hoping it is easily fixable. There are some capacitors in the diagram for the IC that we are unsure about because they have no values linked to them.
Benjamin Gisler	Not only are some variables not labeled in the recommended design from our IC, we are also not getting the desired output even with place holder components.
Kyle Henricksen	Really need an arduino, a battery pack, and several LED's to properly test the system without relying on more speculative numbers.
Doruk Er	Our H-bridge implementation still needs modification and troubleshooting as it doesn't fully behave as expected.

Individual Contributions:

<u>Name</u>	<u>Individual Contributions</u>	<u>Hours this week</u>	<u>Hours Cumulative</u>
Miguel Hennemann	Aided in putting together the components that were recently ordered. Also tested the coils individually and investigated their ability to transfer power over a variety of distances.	7	39
Benamin Gisler	Finished soldering components, assembled and tested	8	37.5

	our first prototype of our power transmitting circuit. Did some basic debugging and rewiring.		
Kyle Henricksen	Inspired team to get Status Reports done, Refactored program to work based on singular battery pack.	5	31
Doruk Er	Assisted in the assembly and test processes, discussed power generation limitations for testing with our advisor for the second time.	6.5	38

Plans for the Upcoming Week:

Name	Plans
Miguel Hennemann	We plan to refine our design a little more, as it did not work the way we wanted. We will spend more time in the lab debugging and looking for issues. I will also contact the manufacturer regarding the unknown capacitor values in their recommended connection diagram.
Benjamin Gisler	Now that we have our needed circuits, we plan to further debug our circuit. I plan to make the wiring on our circuit be much cleaner and easier to follow to further aid our debugging process.
Kyle Henricksen	Get a battery Pack, Arduino, and LED's, and begin rudimentary testing of algorithm and current charge detection for purposes of accurate modulation.
Doruk Er	Test the H-bridge separately once again to examine circuit response. Introduce the

	coils to the breadboard after getting the expected output from H-bridge. Solve noticed problems that rise upon these tests. Check the transmission efficiency and range.
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Summary of Weekly Advisor Meeting:

We met with Craig at the TLA and began building and testing our various circuits. Craig first helped us in testing the transmitter and receiver coils. He also helped us test our H-bridge circuit. We spent some time in the lab trying to figure out pin connections and what were the outputs of those pins. It was really nice to finally sit down, design and test our circuit after weeks of talking about the concept.

