

Team UCC

Progress Presentation #3

Senior Design II



Presented by:

Crepin Mahop

De'Shawnn Woods II

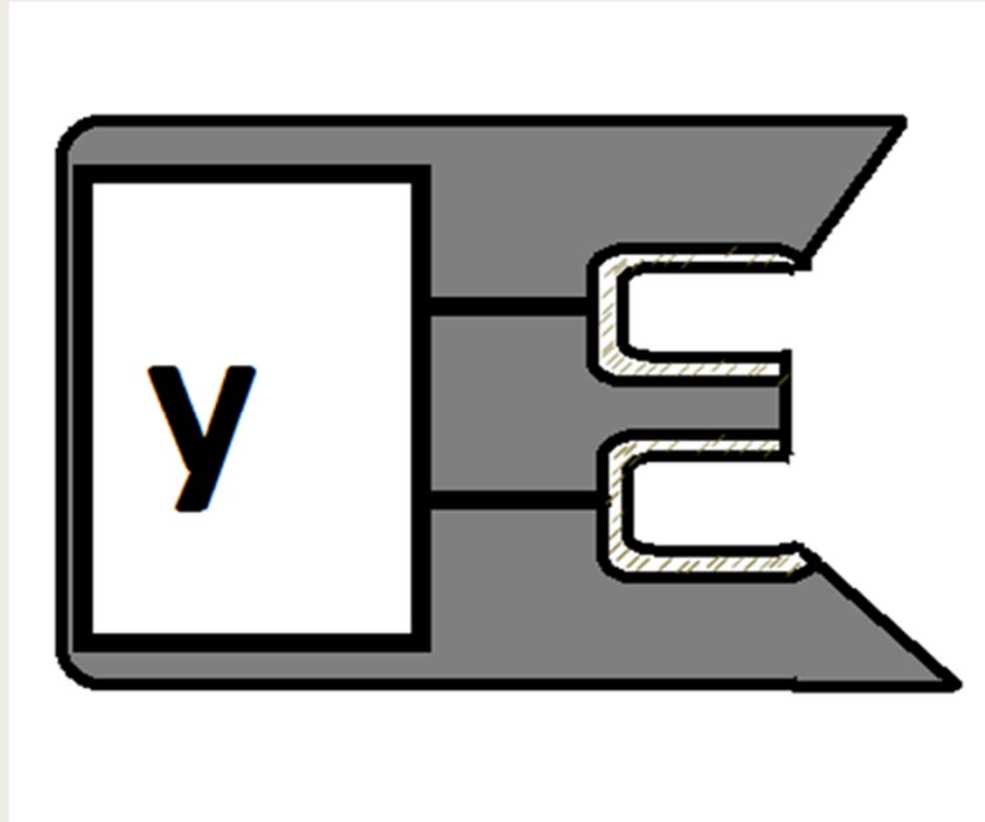
Kerri Chambers

Joshua Ajayi

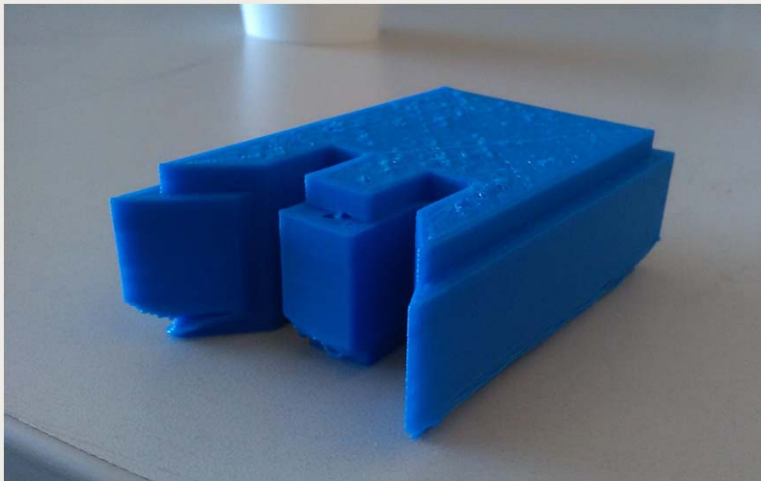
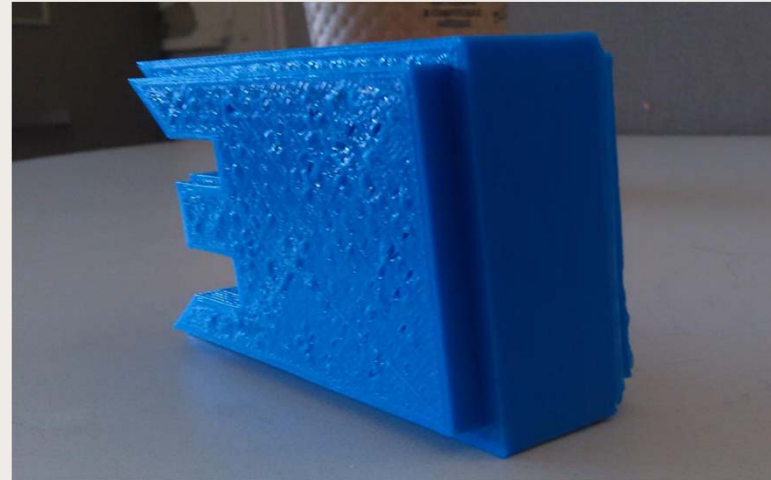
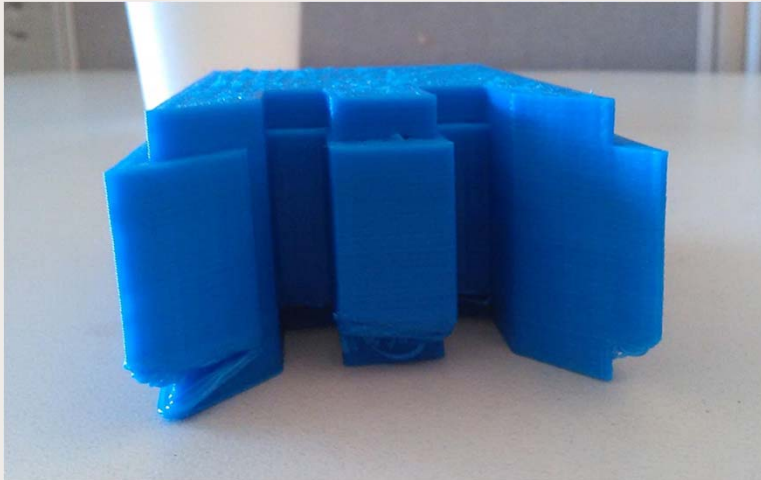
NORTHROP GRUMMAN

Date: March 3, 2015

Charging Station Connector



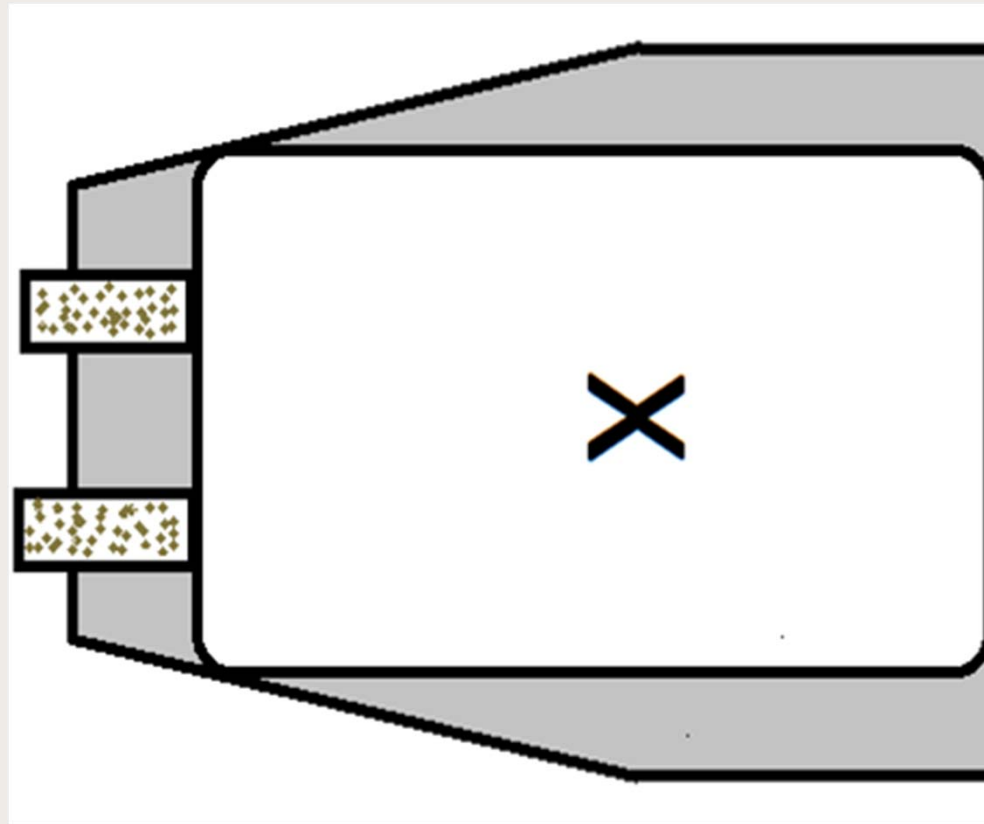
3D Print of Charging Station Connector



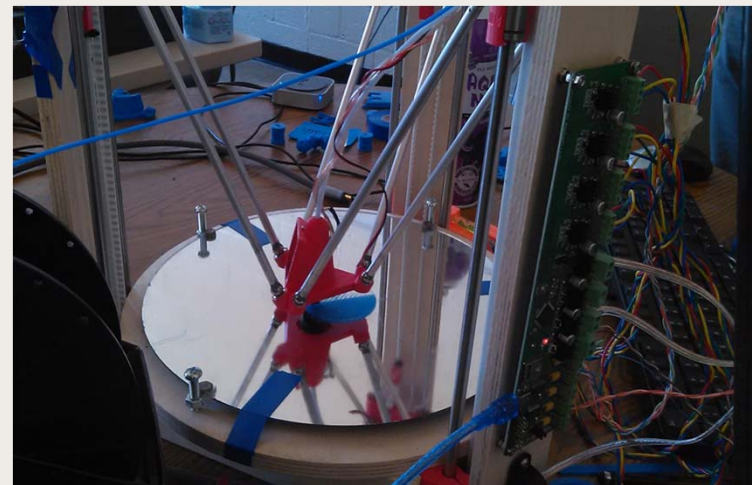
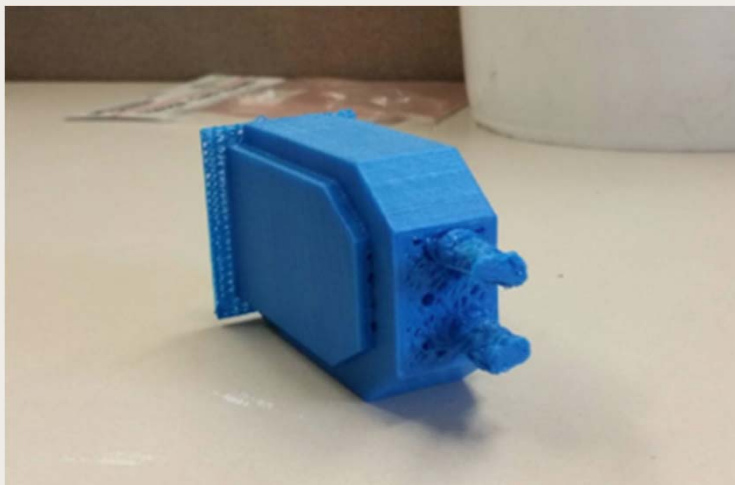
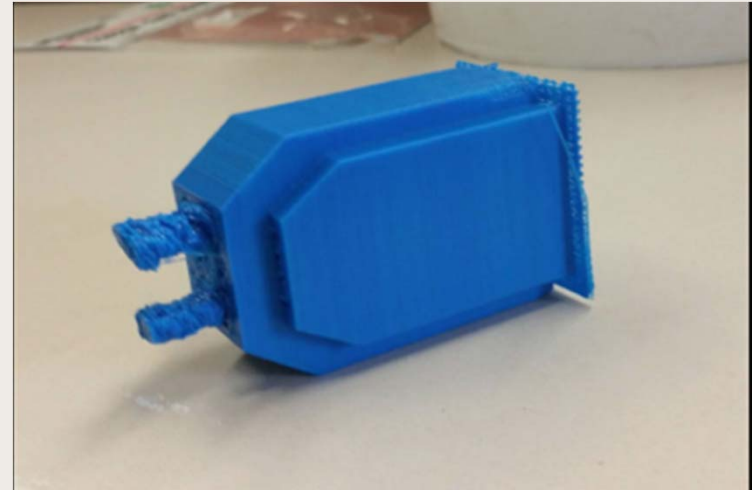
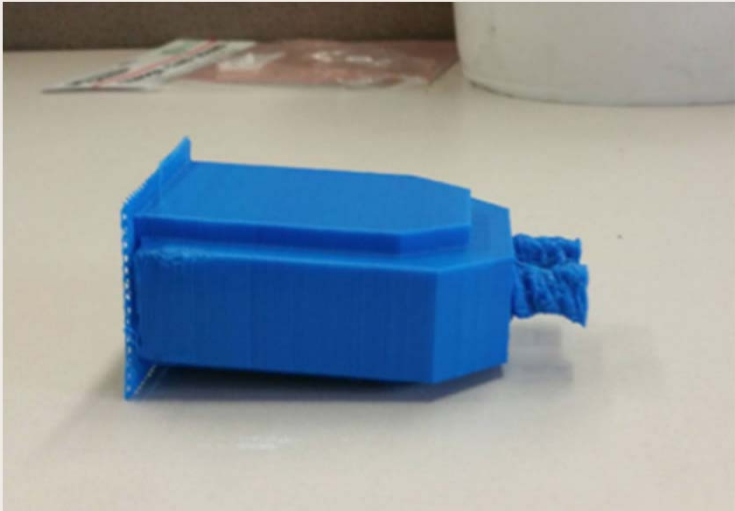
Analysis of 3D Charging Station Connector

- Once the 3D print of the charging station connector was complete, we know that there are certain areas that need to be fixed and altered for a cleaner & precise look.
 - One side of the connector socket section is not the same size as the opposite side of connector socket section.
 - The detail from the design was not fully implemented onto both sides of the connector.
 - To help with the connection, we decide to make the sockets have a circular design, because we feel that it will align more precisely.

Unmanned Underwater Vehicle Connector



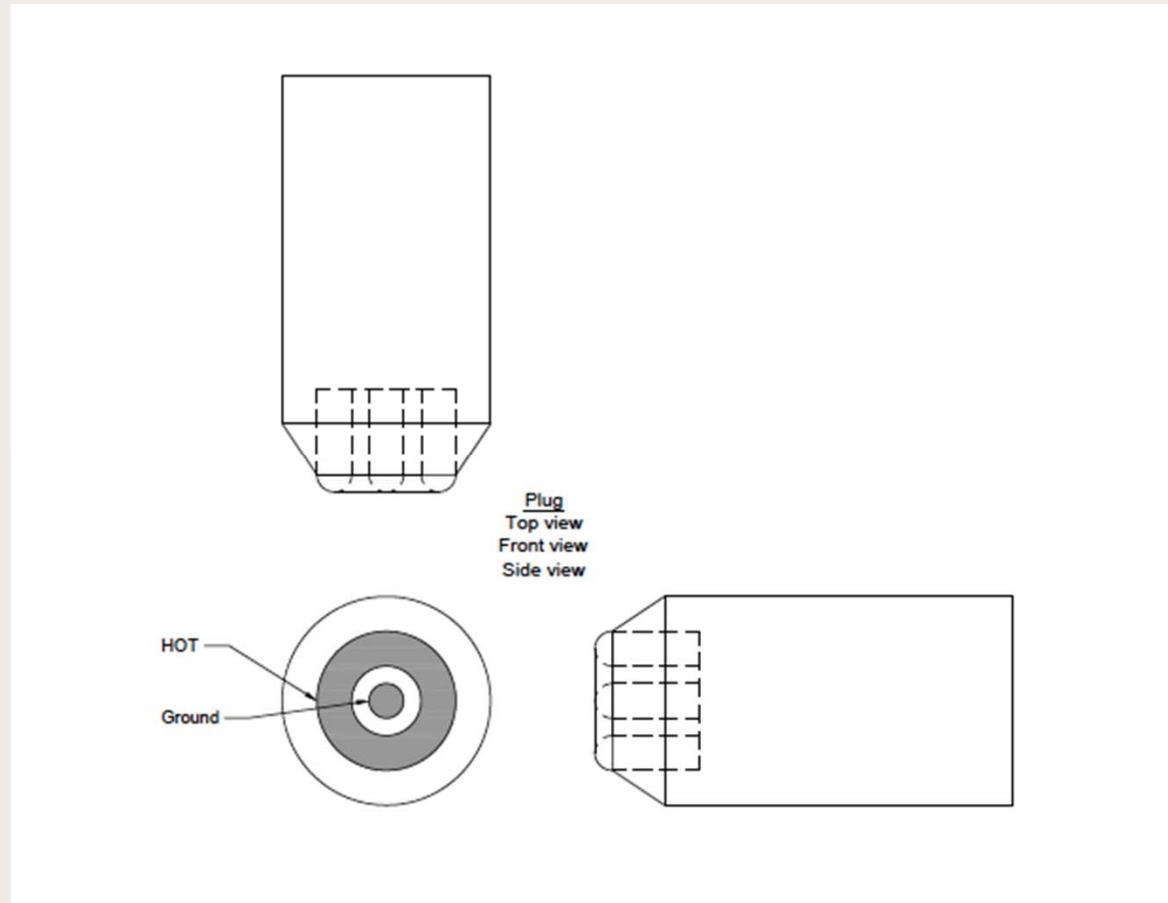
3D Print Unmanned Underwater Vehicle Connector



Analysis of 3D Unmanned Underwater Vehicle Connector

- Once the 3D print of the Unmanned Underwater Vehicle connector was complete, we know that there are certain areas that need to be fixed and altered for a cleaner & precise look.
 - The back side of connector was not as smooth as we thought it would be, so we need to flush the back sides out so it will all be smooth
 - Besides the back area of the connector, everything else with the connector seemed to print fine and clearly.
 - We made the connector plugs have a cone circular shape circular design, so that the connection transition will be a lot smoother and easier, in comparison to the rectangular design before

NEW Design: Unmanned Underwater Vehicle Connector Plugs



Design Requirements

- Input Power: 48 V DC, 25 A
- Capable of functioning in seawater as well as fresh water (\geq 100 meters deep)
- Capable of functioning in temperatures between -2°C and 50°C
- Surviving in temperatures between -40°C and 70°C
- Capable of spending 25 years submerged in seawater
- Capable of carrying a 2.4 or 5GHz 802.11 signal across the connector.

Current & Future Schedule

<u>#</u>	<u>Task</u>	<u>Start</u>	<u>End</u>	<u>Duration (Days)</u>
1	Establish RF Connection in Incremental Steps	2/27/2015	3/6/2015	8
2	Begin to wind the inductors and alter design to fix issues presented before	2/27/2015	3/6/2015	8
3	Fabricate Niobium Connectors via Howard University Machine Shop	2/27/2015	3/13/2015	14
4	Mechanical and Electrical Sub-System Component Integration	2/27/2015	3/13/2015	14
5	Integration Testing	3/13/2015	3/20/2015	8
6	Prepare Report Material for Critical Design Review	3/6/2015	4/3/2015	28
7	System Demonstration	4/9/2015		1

Highlights of the Period

- Created a 3D Print of the connectors for the Unmanned Underwater Vehicle and the Charging Station.
- Received the parts to wind the inductor for the circuit.
- Decided to create a more smooth and easier design for the Unmanned Underwater Vehicle connector plugs, that implements the cone circular shape design for ease of connection.
- The arduino boards have been altered and fixed, waiting for parts to test arduino boards fully.

Lowlights of the Period

- The parts to begin winding the inductor was received late.
- For the arduino boards, our purchase list can not be fulfilled because we are waiting to receive the funds to purchase the items.
- The back side of connector for the Unmanned Underwater Vehicle was not as smooth as we thought it would be.
- Our sponsor, James was sick with the Flu so he was not able to come out to Howard so we could use his network analyzer

Risk Mitigation Measures

<u>Risk</u>	<u>Probability</u>	<u>Impact</u>	<u>Risk Control & Management</u>
not receiving the necessary part for the implementation of the prototype	45%	delaying th project completion	-request funding from from our faculty advisor -using personal fund to order the necessary part
not having the necessary knowledge on how to use the machine shop on the Niobium metal	55%	Not having the desired shape of the niobium pieces	Get in contact with faculty members in the mechanical department that are proficient in the usage of the machine shop of CEASC
not having the necessary time to go through prototype testing	35%	Uncertainty on the full operation of the prototype	Speeding the assembling process as well as the prototype 3d housing printing process to save time.

Focus of Next Period Activities

- Acquire the materials to show full and proper connection between the two arduino boards
- Create the housing assembly packaging for the two connectors.
- Wind the inductors for the circuit board, and make sure that the inductor works properly.
- Begin integrating the parts together to show a full system assembly and shown the final product