

Meeting Minutes

9/4/2018 3:30PM to 4:30PM

International Ballroom, Student Union Building

Colton Artis, Stephan Hain, Brady Hislop, Kiana Pitman, Jacob Miller, Dan Cordon

Item	Notes and Discussion	Action
Introduction	The members of the project were introduced to each other as well as the introduction of the graduate mentor (Jacob Miller) and the project instructor (Dan Cordon).	NA
Team Member Contract	A contract template was provided for the group and was filled out appropriately for the knowledge available at the time. The contract is subject to change, and will do so as deemed appropriate.	Brady Hislop will be typing the formal report that will each member will sign for the next meeting.
Setting up Further Communication	Time and day for weekly meetings were established based on each member's availability. The decided meeting time is on Thursday, between 4:00pm and 4:30pm in Daniel Cordon's office. The group decided on using GroupMe app as a form of communication, but Jacob Miller and Dan Cordon will be reached via email or dropping by their offices.	Kiana Pitman will be setting up a group with GroupMe. Brady Hislop will be contacting the clients to try and set up a meeting with them for Friday, 9/7/18.
Project Discussion	Using Google Docs was decided on for sharing and storing relevant project documents. The group discussed some of the tasks to be assigned. Task assignments are subject to change.	NA

Next meeting will take place on Thursday, September 13

9/13/2018 4:00 PM to 5:00PM

McClure 207

Colton Artis, Stephen Hain, Kiana Pitman, Brady Hislop, Jacob Miller, Dan Cordon, and Eric Mittelstaedt

Item	Notes and Discussion	Action
Client Questions	The members of the team were able to ask the client questions and gain an idea of what the goal of the project.	N/A

Budget	We discussed starting on a preliminary budget.	Brady is in charge of setting up the initial budget.
Acoustic design	We discussed some ideas on the acoustic designs that may work for this project. We are looking at a high aspect ratio model right now with hopes that it will constructively interfere with the transducers stacked on top of one another.	Brady and Colton can work together on the acoustic design and seeing whether or not the aspect ratio works as we are thinking that it will.

Electrical design	We discussed the proper testing equipment for Kiana and Stephen to allow them to see the signals that are being sent through the transducers.	Kiana and Stephen said they would try to obtain a oscilloscope.
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The next planned meeting is September 20th.

9/20/2018 4:00 PM to 4:30PM

Janssen Engineering Building 126A

Colton Artis, Stephen Hain, Kiana Pitman, Brady Hislop, Dan Cordon

Item	Notes and Discussion	Action
Electric Signals	Discussed how to pulse transducers. Talked about how to send signals as well as the possibility of pulsing multiple transducers at once	Kiana and Stephen said they would try to test more on the electrical signals on Thursday the 27th.
Slide	Discussed the creation of a slide to allow for accurate measurement of the acoustic beam width	Colton and Brady said they would work together to create a slide for the testing of transducer beam width.
Frequency	Discussed which frequency that should be used for the transducers. Based upon angle width as well as money concerns on how many transducers can be bought.	Whole team is working together to ensure that this design works not only for the acoustics but also the electrical side of the project.
Schedule	Discussed how we would like to	Whole working together to move

	progress in the next few weeks as we attempted to make as much headway on the project that we can in the next few weeks.	ahead with the schedule.
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9/27/2018 4:00 PM to 4:30PM

Janssen Engineering Building 126A

Colton Artis, Kiana Pitman, Brady Hislop, Dan Cordon and Jacob Miller

Item	Notes and Discussion	Action
Rectangular Frame	We discussed that building anything other than a rectangular frame would bring extreme challenges to the Engineering of the frame. We were also given a suggestion from Jacob about the Extruded Aluminums that we may be able to use for the frame.	Colton and Brady are going to finish the building of our 3D printed parts for testing purposes and then we will look into the extruded aluminum.
Pic 32 testing and Renting Amplifiers	We discussed the testing of the Pic 32 and then how Kiana feels that an amplifier could be rented to do testing with. Also once this testing is completed this would allow them to purchase the proper amplifier without having to take on a large initial cost for an amplifier that may not do the job.	Kiana and Stephen are planning on testing the pic32 in the lab and then going from there.
Pic 32 Further	We discussed the possibility of the need for two Pic 32's to allow a large number of transducers to be pulsed at the same time.	Kiana and Stephen plan on testing in the lab to determine if this is necessary.
Finishing Parts	We discussed the need to	Colton and Brady will work

	finish the 3D printed parts that we need for testing. Furthermore, we discussed the need to make sure that we do this as soon as possible to allow us to test the beam width of the transducers as soon as possible.	together to finish the necessary parts for the slide.
Snapshot Preparations	We discussed the need to set up a Gant Chart, Schedule and a slightly better budget for the coming snapshot.	Whole team plans to work together to determine the schedule for the project for the semester.

10/04/2018 4:00 PM to 4:30PM

Janssen Engineering Building 126A

Colton Artis, Stephen Hain, Kiana Pitman, Brady Hislop, Jacob Miller

Item	Notes and Discussion	Action
Pic32 Testing	Kiana and Stephen plan to do testing of the PIC32 in the coming week	Kiana and Stephen
Testing of Acoustics	Plan on testing the transducers this weekend in order to get more accurate knowledge of the transducers beam width	Brady and Colton will test the transducer beam width

Snapshot	Discussed how we would like to present our project at the first snapshot day. Summaries and various portfolio updates.	Kiana Summaries, Brady and Colton holder
Problem Statement	Discussed the need for a definition of the problem we are trying to solve.	Team
Input	Discussed the input and output of the signals using the PIC 32	Team
Look over Acoustic Design	Discussed the need to look over the acoustics designs we are considering	Colton and Brady
Mindworks	Look over mindworks to figure out what we need to have for Snapshot	Team

10/11/2018 4:00 PM to 4:30PM

Janssen Engineering Building 126A

Colton Artis, Stephen Hain, Kiana Pitman, Brady Hislop, Dan Cordon Jacob Miller

Item	Notes and Discussion	Action
Dr. Anderson's PicoScope	He needs his picoscope back. This affects our testing ability. We can try and borrow it periodically, buy a new one, or test without it. We may only need one for a couple of weeks, because the testing will start to be done with the pic32.	Brady will talk with Dr. Anderson about borrowing it occasionally.
Coding from shared drive was	Shared drives were wiped	Kiana and Stephan will try

wiped	over the summer. A lot of coding was lost. Some code was recovered that was on Kiana's USB.	and recover some of the code they had that will be useful for testing.
MatLab to process the data	MatLab has a section with built in shapes that allow the user to assign values and it will map out the interior.	Colton will look into the function to see if the user can provide lines with average values that will process the data for us.
Extruded Aluminum	We discussed the precision of lengths. We want the final product to be a square meter, but the testing is set up to be done with 1/4th of a square meter.	Colton look into McMaster Carr in order to find prices and bundles that we can purchase.
Previous mapping demonstrations	The research team has an example of how they mapped the data.	Brady will consult the team to try and obtain an example of the work to show during next meeting.

10/18/2018 4:00 PM to 4:30PM

Janssen Engineering Building 126A

Colton Artis, Stephen Hain, Kiana Pitman, Brady Hislop, Dan Cordon

Item	Notes and Discussion	Action
Extruded Aluminum Frame	Discussed the possibility of building the frame out of extruded aluminum to ensure that little to no deflection is occurring in the frame. We also discussed the want to build this frame so that testing could be done properly. We are also planning on building a small scale version before	Brady and Colton are working together to put together all of the necessary parts to get working on the frame.

	upgrading to a larger version next semester.	
Transducers vs. hydrophones	Discussed the need to decide whether we want to use hydrophones or transducers for the sending and receiving of the acoustic signals this is a mechanical and electrical issue.	Brady is going to send the information about hydrophones to Kiana and Stephen to determine if they work for the EE side of things the believe on the mechanical side is that the hydrophones will be more sensitive to the signal from the sending transducer.
Logbooks	Dr. Dan discussed the need for logbooks to be improved to have more talking points about the project in them, this includes better drawing and more discussion of what is occurring in the project and where we are headed with the project	Team will aim to improve their logbooks for the end of semester review.
End of Semester Goals for ME's	Discussed the goal for the mechanical side of the project by the end of the semester. This included building of the extruded aluminum frame as well as the prototyping of the holder to keep the transducers from moving once they have been set in place and calibrated.	Brady and Colton will work together to build the extruded aluminum frame and prototype holders for the transducers.
End of Semester Goals for EE's	Discussed the goal for the electrical side of the project. This included the goal of sending one signal and receiving three, while working through the coding and electrical issues. Additionally they hope to select an amplifier by the end of the semester.	Stephen and Kiana will work together to try to reach their end of the semester goals.

Testing	Discussed how we would like to test the sending and receiving of the signals. We plan on starting with one transducer sending from the midpoint of a side opposite to the three receiving transducers.	Team will work together to create the mechanical frame and electronics to make this system come together before the end of the semester.
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10/25/2018 4:00 PM to 4:30PM

Janssen Engineering Building 126A

Colton Artis, Stephen Hain, Kiana Pitman, Brady Hislop, Jacob Miller

Item	Notes and Discussion	Action
PIC32	Discussed the fact that Kiana and Stephen have found their code allowing them to start testing in the lab with the PIC32, additionally Dr. Budwig provided Kiana and Stephen with an amplifier that will allow them to do testing	Kiana and Stephen are going to try and secure a PIC 32 by the meeting next week so that they can begin testing the lab additionally Kiana will be getting a key to the lab allowing Stephen and her to do testing without having to have Brady open up the lab.
Hydrophones	Discussed the fact that Teledyne had really good opportunities for the Hydrophones, the depth rating for the hydrophones is not great however, we felt that for the proof of concept this would still be satisfactory. Also Kiana and Stephen felt that hydrophones would not need to be filtered like the transducers would.	The team will work together to see if the hydrophone are a viable option for us.

Construction of the aluminum frame and transducer holders	Discussed that we would like to start building the extruded aluminum frame by this coming week. This will allow us to move forward with the design of the transducer holders as well once we have an idea as to what the holder connector to the frame needs to look like.	Colton and Brady will work together to start building the extruded aluminum frame.
Rubber Gasket	Discussed that for the transducer holders a rubber gasket may be a good idea to ensure one that the transducer is held snug while two ensuring that the transducer does not propagate sound through the frame creating a unwanted signal in the receiving transducers.	

11/1/2018 4:00 PM to 4:30PM

Janssen Engineering Building 126A

Colton Artis, Stephen Hain, Kiana Pitman, Brady Hislop, Jacob Miller, Dan Cordon

Items	Notes and Discussion	Action
Design Review	There was discussion of when the design review should be scheduled the thought at this point is the design review should wait until after we have more data to share with the reviewers	Team will work together to gather as much data as possible before Thanksgiving break to ensure that when we decided to do the Design Review we are ready to go.
Amplifier	It was mentioned that the	Brady will contact Dr. Budwig

	amplifier that Brady picked up from Dr. Budwig's former project was not an amplifier.	and see if there is more information on the amplifier that he was thinking the team could use.
Pulsing of Transducers	Kiana and Stephen mentioned the possibility of having another way of pulsing the transducer that was more cost effective than renting of an amplifier. There thought was to use a 200 volt power supply and a switch to pulse the transducers at the wanted frequencies.	Kiana and Stephen will brainstorm ideas on how to pull this off.
Extruded Aluminum Frame and Transducer holders	There was discussion about the frame since the sides and legs have been cut. The next step will be purchasing of the connectors over the weekend. Additionally, there was discussion about the transducer holders and the need for Colton and Brady to get started on prototyping the holders.	Brady will order connectors and Colton and Brady will prototype transducer holders.

11/8/2018 4:00 PM to 4:30PM

Janssen Engineering Building 126A

Colton Artis, Stephen Hain, Kiana Pitman, Brady Hislop, Dan Cordon

Items	Notes and Discussion	Action
Prototyping Transducer Holder	Discussed how we want to go about prototyping transducer holders for the project. We plan on first obtaining a plastic that will allow for easier machining than a	Brady and Colton are planning on working together to get the material and start building the prototype for the transducer.

	metal would. We may decide to stick with the plastic especially for this proof of concept design.	
Uncertainty Analysis	Discussed the need to compile and uncertainty analysis for the project to ensure that we are getting the accuracy of measurements of the time of flight that we are hoping for.	Team plans to work together to calculate all of the uncertainties that are present in the system.
Wiki page	Discussed with Stephen the aspects of the Wikipage that he needs more information on such as pictures and a small bio on ourselves.	Team will get as much information to Stephen as possible so that he has adequate information to set-up the wiki page.
Oscilloscope	Discussed the want to get an oscilloscope into the lab so that Kiana and Stephen can measure the electrical properties of the transducers.	Stephen will email Dr.Cordon so that they can attempt to get a oscilloscope into the Acoustics lab.

11/15/2018 4:00 PM to 4:30PM

Janssen Engineering Building 126A

Colton Artis, Stephen Hain, Kiana Pitman, Brady Hislop, Dan Cordon, Jacob Miller

Items	Notes and Discussion	Action
Design Review	10:30am -Friday Nov. 30th	Team decided this was the best time for everyone to come together to have our design review.
Dr. Budwig	Discussed the fact that Dr.Budwig would be in Moscow on Thursday and	Team will compile all of the work from the semester and have it ready to present for

	Friday Nov.29th and 30th. He will not be able to make it to the team meeting on Thursday however he will stop by on Nov. 30th at Snapshot Day and will be present for the Design Review on Nov. 30th as well.	Snapshot Day and the Design Review.
Raw Material	Dr. Cordon suggested some materials that he feels will work the best for the prototyping of the transducer holders.	Brady will order the needed materials in order for the holders to be prototyped.
Propagation of Sound	Discussed the possibility of the sound propagating through the frame. Also discussed that this should not be an issue however, there are ways that this can be mitigated including the use of rubber.	Team will work together to mitigate the possibility of sound propagating through the frame.

11/29/2018 4:00 PM to 4:30PM

Janssen Engineering Building 126A

Colton Artis, Stephen Hain, Kiana Pitman, Brady Hislop, Jacob Miller

Items	Notes and Discussion	Action
Snapshot Preparation	Discussed the items that we need to have completed by tomorrow Snapshot Day. We are mostly completed however there are some small things that we need to add to the portfolio and complete for the	Team will work to compile all needed documents by tomorrow morning.
Transducer Holder	Discussed how we would like	Colton and Brady will work

	to prototype new holders to design for the ease of machining and to ensure that the part allowed for a rigid frame.	with Jacob to determine the best method of creating the holder.
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