ASSIGNMENT/ASSESSMENT ITEM COVER SHEET

Student Name: Clayton (FIRST NAME) Carlon (FAMILY / LAST NAME)

Student Number: 3 3 2 7 9 8 6 Email: clayton.carlon@uon.edu.au

Course Code	Course Title
ELEC4840	Final Year Engineering Project Part A
(Example) ABCD1234	*(Example)* Intro to University

Campus of Study: Callaghan (eg Callaghan, Ourimbah, Port Macquarie)

Assessment Item Title: Meeting Notes Due Date/Time: 2/6/2023

Tutorial Group (If applicable): Word Count (If applicable):

Lecturer/Tutor Name: Dr. Behnam Akhavan

Extension Granted: ○ Yes ◉ No Granted Until:

Please attach a copy of your extension approval

NB: STUDENTS MAY EXPECT THAT THIS ASSIGNMENT WILL BE RETURNED WITHIN 3 WEEKS OF THE DUE DATE OF SUBMISSION

Please tick box if applicable

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I verify that I have completed the online Academic Integrity Module and adhered to its principles

☐ *Students within the School of Education:*
"I understand that a minimum standard of correct referencing and academic literacy is required to pass all written assignments in the School of Education; and I have read and understood the School of Education *Course Outline Policy Supplement*, which includes important information related to assessment policies and procedures.

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I certify that this assessment item has not been submitted previously for academic credit in this or any other course. I certify that I have not given a copy or have shown a copy of this assessment item to another student enrolled in the course.

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DATE STAMP HERE

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Turnitin ID: (if applicable)

Signature: Date: 2/6/2023

To copy and paste the completed form into another document use the `snapshot' tool.

Print Form

THE UNIVERSITY OF NEWCASTLE AUSTRALIA

RE: FYP: Meeting notes

Andrew Fleming <andrew.fleming@newcastle.edu.au>
Thu 01/06/2023 22:08
To: Clayton Carlon <Clayton.Carlon@uon.edu.au>

Hi Clayton,

Thanks for your meeting notes, I confirm these. Please print a PDF cope of this email as my approval.

Regards,
Andrew Fleming

From: Clayton Carlon <Clayton.Carlon@uon.edu.au>
Sent: Thursday, June 1, 2023 11:34 AM
To: Andrew Fleming <andrew.fleming@newcastle.edu.au>
Subject: FYP: Meeting notes

Hello Andrew,

One thing that I forgot to do in the last meeting was to get you to sign the meeting notes. I have written them down in the shared OneNote from notes written down in our meetings and from memory. But I have also collated them into this document.

Can you please sign the attached document and send it back to me sometime before Friday evening? I believe that only one signature is needed if the meeting notes are combined into one document. If you prefer, I can give the document to you in person in your office.

Thanks,
Clayton Carlon
C3327986
B Electrical & Electronics Engineering and B Computer-Systems Engineering (40073)

Student name: [Name]
Student ID: [ID]

The University of Newcastle
Final Year Project

MEETING NOTES – WEEK 02

Meeting/Project Name:	Sound-source Localisation using a Microphone-array for NUbots		
Date of Meeting: (MM/DD/YYYY)	03/01/2023	**Time:**	16:00 – 16:30
Minutes Prepared By:	Clayton Carlon	**Location:**	EAG29

Attendance at Meeting

Name	School / Discipline
Clayton Carlon	School of Engineering
Andrew Fleming	School of Engineering

Progress since the last meeting

Topics discussed

- The basic description and scope was informed.
- Some context around NUbots was given.
- The need to simulate first before any hardware design was discussed.
    - Such simulation software as Simulink and MATLAB were given as potential software.
- Some aspects of the hardware were discussed:
    - the number of ADCs and channels needed,
    - the sampling frequency of the microphones,
    - the potential need for upsampling as a last resort to improve precision,

Things to do for the next meeting

- A bird-eye's view of the literature was expressed as an importance.

Supervisor's Name		**Signature**		**Date**	

Student name: [Name]
Student ID: [ID]

The University of Newcastle
Final Year Project

MEETING NOTES – WEEK 05

Meeting/Project Name:	Sound-source Localisation using a Microphone-array for NUbots		
Date of Meeting: (MM/DD/YYYY)	03/20/2023	**Time:**	13:00 – 13:30
Minutes Prepared By:	Clayton Carlon	**Location:**	EAG29

Attendance at Meeting

Name	School / Discipline
Clayton Carlon	School of Engineering
Andrew Fleming	School of Engineering

Progress since the last meeting

- Two literature-reviews were informed to Andrew, namely Argentieri et al. (2015) and Rascon & Meza (2017).
- A search of simulation-software was informed to Andrew, namely:
    - Audio Toolbox on MATLAB,
    - Acoustics Toolbox,
    - and Phased Array System Toolbox.

Topics discussed

- COMSOL was suggested by Andrew as a potential candidate.
- Acoustics in gaming was also given as a potential place of inspiration.

Things to do for the next meeting

- Literature-review was stressed as an important area to start.
- The method to benchmark methods was given by Andrew, namely plotting the variance and mean error over noise.

Supervisor's Name		**Signature**		**Date**	

MEETING NOTES – WEEK 07

Meeting/Project Name:	Sound-source Localisation using a Microphone-array for NUbots		
Date of Meeting: (MM/DD/YYYY)	04/03/2023	**Time:**	13:00 – 13:30
Minutes Prepared By:	Clayton Carlon	**Location:**	EAG29

Attendance at Meeting

Name	School / Discipline
Clayton Carlon	School of Engineering
Andrew Fleming	School of Engineering

Progress since the last meeting

- The progress of the literature-review was given.
    - The fact that it was taking longer than expected was expressed.

Topics discussed

- Some of the methods in the literature were discussed such as MUSIC.

Things to do for the next meeting

- The literature-review was to be complete soon, and a table comparing the best methods was to be drawn up.

Supervisor's Name		**Signature**		**Date**	

Student name: [Name]
Student ID: [ID]

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MEETING NOTES – WEEK 09

Meeting/Project Name:	Sound-source Localisation using a Microphone-array for NUbots		
Date of Meeting: (MM/DD/YYYY)	05/04/2023	**Time:**	13:30 – 14:00
Minutes Prepared By:	Clayton Carlon	**Location:**	EAG29

Attendance at Meeting

Name	School / Discipline
Clayton Carlon	School of Engineering
Andrew Fleming	School of Engineering

Progress since the last meeting

- Looked over the paper by Chen & Xu 2019.
- Briefly looked over the spreadsheet of literature examples.

Topics discussed

- Discussed a way forward to simulate literature examples.
- Discussed simulation software:
    - Some possible examples on Python and MATLAB
    - Needs to simulate dimensions of a room, material, etc.
    - Ideally should give a time-domain signal that can be processed into MATLAB or Python, etc.
- Discussed the definition and context of R60 (reverberation time at 60dB) as a metric for reverberation.
- Discussed the effects of reverberation in rooms, e.g. hallways.

Things to do for the next meeting

- Simulation was highlighted as the next step.

Supervisor's Name		**Signature**		**Date**	

Student name: [Name]
Student ID: [ID]

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MEETING NOTES – WEEK 11

Meeting/Project Name:	Sound-source Localisation using a Microphone-array for NUbots		
Date of Meeting: (MM/DD/YYYY)	05/15/2023	**Time:**	13:00 – 13:30
Minutes Prepared By:	Clayton Carlon	**Location:**	EAG29

Attendance at Meeting

Name	School / Discipline
Clayton Carlon	School of Engineering
Andrew Fleming	School of Engineering

Progress since the last meeting

- Informed the use of the Python module pyroomacoustics as a way to simulate reverberation.

Topics discussed

- Discussed the methodology of testing:
    - A simulation loop is run for the same room-conditions
    - 10,000 results are needed for variances.
    - 100 levels of noise are tested.
    - The mean error and the variance are to be calculated for each level or noise and plotted against noise.
    - A random seed is needed.
    - The mean is expected to stay around zero if the estimator is unbiased.
    - If it is biased, then it may stray further with noise.
    - The variance is expected to increase linearly with the logarithmic scale of noise.
- The noise is the thermal noise on the microphones.

Things to do for the next meeting

No meeting was to be after this one.

Supervisor's Name		**Signature**		**Date**	