Meeting Agenda (Week 3)

11th March 2019, 1 PM – 2 PM

Attendance:

Member	Attendance
Ben Li	Yes
Jiawei	Yes
Jireh	Yes
Jordan He	Yes
Jose	Yes
Link Geng	Yes
Minh Doan	Yes
Frederick Chew	Yes

Main objectives:

1. Discuss and review project scope with client
2. Development of timeframe
3. Present and proposed project budget
4. Delegation of

Critical decision made:

Project Outcome:

This project will develop a 360-degree camera system for web conferencing, allowing clients to focus on the appropriate parties based on sound localisation. The task will be done by combining several physical devices and potentially existing open source libraries.

Initial Project Timeline

Task	Description	Expected Completion
Initial components acquisition	Order the initial products such as raspberry-pi, microphone array and webcam	Week 3
Obtaining funding	Receiving microgrant from CECS and client	Week 4
Conceptual prototype	Develop a conceptual prototype with technical drawings for visualisation	Week 4
Methodology	Develop an initial	Week 4

	methodology for tackling the problem	
Direction of arrival (DOA) algorithm	Developing and testing DOA algorithm for sound localisation	Week 4
Multiple camera setup	Setting up multiple video inputs on the Raspberry Pi	Week 5
Video and sound synchronisation	Ensure the sound and video inputs are synchronised with one another.	Week 6
Video switching	Switching camera input based on sound localisation	Week 6
Noise cancellation	Filtering out external noises and interferences from sound inputs	Week 7
Interface design	Design a unified interface for video output template from Raspberry Pi	Week 7
System optimisation	Optimise the data transmission between Raspberry Pi and computer to reduce overhead	Week 8
Prototype assembly	Assembling the final prototype and ensure the design is appropriate	Week 8
Prototype testing	Conduct testing of the 360o web conferencing device	Week 10
Handover document	Compilation of handover documents and ensure a guide is create for future assembly	Week 11

Summary:

Client's requirements:
1. Powered by USB is preferable, if not then AC current or battery for portability.
2. The Raspberry Pi output the video in H264 video format.
3. The video quality should be 1080p, if not 720p is acceptable.
4. Ability to reduce noise from external sources to avoid sound feedback.
5. The device does not cost more than $300 in total.
6. Plug and play with no extra software needed.
7. Combine multiple sources of videos and present multiple viewpoints at once.
8. The project should be open sourced.
9. It should be simple to build and operate.
10. Proper documentation to ensure it is replicable.
11. Source code should allow easy update.
12. The device should be easy to upgrade in the future.

Importance Notice:
- Client will be away from 6th of April until 6th of May, will still be available for video conference.
- This product could possibly be presented at an ASCILITE conference at the end of the year.

Project Risks:
1. Failure of ReSpeaker 4-Mic Array
2. Delay in deliveries of components
3. DOA algorithm is not supported on the ReSpeaker 4-Mic Array
4. Video stream exceeds the Raspberry Pi USB bandwidth
5. 4 cameras set-up is not sufficient for 360o conferencing
6. Processing of videos cause input lag
7. Images and sounds are not synchronised.
8. Physical failures of components

Funding Expectations:
1. CECS Funding - $100
2. Client Funding - $200

IP Consideration:
GNU GPL will be applied to the project to ensure it is open sourced

Team Member Responsibility:
The following group roles and tasks for the project were delegated based on each student's engineering major.
Sound (Direction of Arrival) - John, Jose
I/O (File Conversion) – Link, Hongjian, Ben
Image (Processing) – Link, Hongjian, Ben
Assembly (Modelling/manufacturing) – Minh, Jireh
Documentation – Minh, Jireh

Goals
Crash Goal
Camera switching based on sound input

Stretch Goals
Fully functioning 360o web conferencing camera (real time, high quality)
Facial recognition
Image Stitching

Audit Goals

	Sound	Image	I/O	Assembly
Audit 1	Sound localisation algorithm	Multiple video inputs	Analysis of I/O standards	Interfacing microphone array with raspberry pi
Audit 2	Input clarity Synchronisation with video input	Video switching based on sound inputs	Unified standards	Combining multiple cameras with sound system
Audit 3	Noise cancellation	Image stitching (Interface design)	Optimisation of data transmissions	Produce prototype housing

Task delegation:

Task	Delegation	Due Date	Comment
License File	Jordan	Friday, 15th Mar	
Contingencies	Minh, Jordan, Link, Ben, Jose, John	Friday, 15th Mar	
WBS and Timeline	Minh, Jordan	Friday, 15th Mar	
Concept Design/Methodology	Link, Ben	Friday, 15th Mar	
Design Drawing	Jireh, Jose, John	Friday, 15th Mar	
Concept of Operations	Minh, Link, Ben	Friday, 15th Mar	