Bodystorming and Gathering Feedback on the Idea of Interacting with 2D Video Call Settings Through Hand Gestures

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***Abstract*—The COVID-19 pandemic has caused a surge in the use of video call software, as many in-person activities have shifted online. For example, lectures have been moved to video calls. However, some users have found it difficult to adjust to the shift from in-person to online interactions, and some may find the video conferencing software challenging to use. We did some testing to see if our idea of allowing individuals to manage call features, such as muting their microphone and adjusting the computer volume, even if they are not sitting directly in front of their computer, would be received well.**

***Index Terms*—gesture recognition, video call, computer vision,**

I. Introduction

While video calls have seen a rise in usage due to the pandemic [1], practically every video calling software uses UI and/or keyboard shortcuts to allow the user to control the program. We used the bodystorming technique to gather feedback and ideas from users to see if our prototype would be effective in achieving what we want and if there were any improvements we could make to the idea. It should be noted that our bodystorming method was a bit different than the one outlined in the assignment pdf due to the fact that our idea will not be made in VR or AR.

II. Methods

We first create a use case to see how the task of controlling video call settings was done traditionally. Then we created a persona that detailed what kind of experience we wanted our user to have with our hand gesture prototype. Both of which cna be seen in the Appendices section.

We tested our prototype by role-playing situations where our prototype will be used. We had actors play as a teacher and student presenting information on a whiteboard where they are holding a marker in their hand and are far away from their computers. This allows both actors to try out using hand gestures to control video call functions and to find any pain points they may have with using our prototype. Each actor chose their own hand gestures that they thought would be best for each function. This allowed us to test a wider variety of hand gestures before choosing one that will work best. The roles were then reversed and each role-play situation was redone.

While an actor is playing the scenario, they are taking notes on actions being performed such as the hand gestures being used to control a specific function and when the gestures were used unintentionally. This allowed us to test how well each action worked for different functions and reduce the amount of accidentally activating a function.

III. Results

From our tests we identified several problems. The first was that there were several times where the actor could unintentionally activate one of the controls by doing an action with their hand that looked similar to the hand gestures used to control the call. This becomes a problem depending on how accurate the hand tracker will work, as we will need to use gestures that are not commonly used if the hand trackers are less accurate. We also found that people associated a wide variety of gestures for each function, which becomes a problem when trying to find a gesture that best fits each function. We also found that some gestures people used were too similar to each other and may activate both functions when not intended, which overlaps with the problem of unintentional activation. Some feedback we received was to make it so that only the user's non-dominant hand activates gestures.

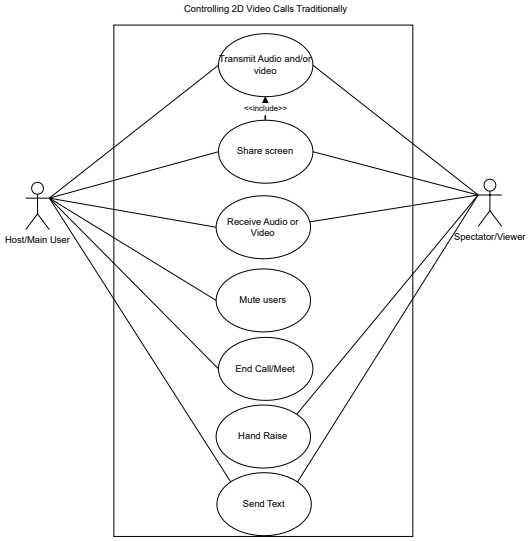
Conclusion/Discussion

The results from the bodystorming participants taught us that there is a wide variety of gestures that people might use. For our prototype, it may be best to add an option to customize each gesture per function which allows users to choose their own gestures. This will also solve the problem of gestures being too similar to each other, as we can add a feature that blocks users from inputting gestures too similar to each other. We also used the data we got to rewrite our use case. Other future work may include testing the accuracy of hand tracking, how the users will feel using their non-dominant hand as function inputs, and gathering a large amount of different gestures that can be inputted as options users may choose from.

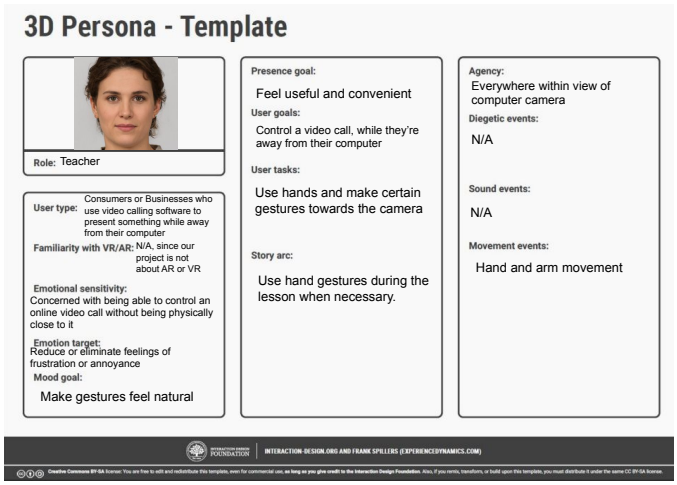
References

[1] Karl, K. A., Peluchette, J. V., Aghakhani, N. (2022). Virtual Work Meetings During the COVID-19 Pandemic: The Good, Bad, and Ugly. Small Group Research, 53(3), 343–365. https://doi.org/10.1177/10464964211015286

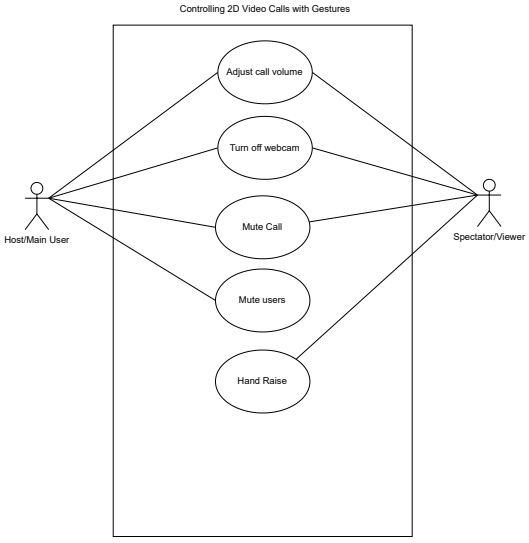
Appendix A
Use Case



Appendix B
Persona



Appendix C
Revised Use Case



APPENDIX D
NOTES FOR BODYSTORMING SESSION 1

Actor 1
Gestures used:
Raise hand – mute call
Swipe across sceen – turn off webcam
Raise hand/lower hand – adjust volume

Actor 1 as teacher (standing up): Issues
Writing on board activating mute call
Raise hand to adjust volume activating mute call

Actor as student (sitting down): Issues
Distance to computer unknown:
Close to computer - cant see hand when raised
Further from computer – hard to read screen/chat
Stretching activating mute call

Actor 2
Gestures used:
X with arms – mute call
Raise hand/lower hand – adjust volume
Swipe across screen – turn off webcam

Actor 2 as teacher (standing) Issues:
Writing on board activating adjust volume (depending how well hand tracking is, if it detects front of hand compared to back of hand)

Actor 2 as student (sitting) Issues:
Distance to computer unknown:
Close to computer - cant see hand when raised
Further from computer – hard to read screen/chat

APPENDIX E
NOTES FOR BODYSTORMING SESSION 2

Gestures feedback

Actor 1
Teacher
Raising hand to write on something like whiteboard might activate a gesture
Gestures too similar
It would need to work as it would be difficult to do without testing
Suggestion: make it that only non-dominant hand activates gestures

Student
Deaf person sign language
Too close can't read in natural environment
Stretching issue
Similar issues to teacher with gestures too similar or proper testing needed

Actor 2
Teacher
Where's the starting point where it starts recognizing you try to change volume
X seems better to mute than hand raise
Suggestion: thumbs up and down for volume

Student
Same feedback as teacher and previous student scenario

The same gestures were used from Notes 1 for actor 1 and actor 2 respectively.