Using Bodystorming to Help Convert Microphone Muting and Video Disabling Actions in a Video Calling Environment for Tobii Eye-Tracker Usage

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***Abstract*—Bodystorming can be used to determine how well certain situations that might occur during a one-on-one video call from a user's home can be adapted to only use eye-tracking software as an input method. This report demonstrates a bodystorming session involving two participants acting out two different interactions using a laptop set up with Tobii Gaze Trace and a mockup UI image. Notes taken throughout this session gave insight into how to reduce eye strain by using solely the movement of pupils as input while keeping the interface natural feeling by focusing on visual feedback, and minimalist interface design.**

***Keywords*—** eye-tracking, bodystorming, video calling

I. Introduction

Bodystorming allows us to use paper prototyping and Wizard of Oz to demonstrate situations and analyze different interactions without having to have a functioning product. This greatly benefits us, given the amount of development time we have. Mapping out interactions before implementation will let us focus more on polishing rather than having to scrap assets due to a change in perspective later in development. Because of this, we also narrowed down the project's scope to demonstrate the actions of muting the microphone and disabling the video feed of a user in a one-on-one conference. These two interactions made the most sense to automate using eye-tracking as they are used more frequently than other features such as raising your hand or typing in a chat box. They also correlate very well with actions taken in the real world during a video call. For example, most users will not want their microphones or cameras on while away from the computer; which means we can tie gaze detection to both of these interactions. Implementing interactions in this manner means that we can have them feel natural in the workflow of using video chat software. See Figure 1 for a diagram of how we aimed to have our use case work during the session.

II. Methods

We first established who the target user of this use case was by making a persona. "Phil" is a travel agent who has multiple sclerosis, and suffers weakness in his arms. He finds it troublesome to use a traditional keyboard and trackpad for his laptop and relies on accessibility software like voice recognition. See Figure 2 for more details on this persona. This is the user we will be role-playing during the bodystorming session. The physical environment consisted of a desk and chair set up with a laptop. This laptop has a mock UI layout consisting of a video feed of two users in a one-on-one call. The only discrete buttons on-screen are a button to access the settings, and a button to leave the call. See Figure 3 for a static screenshot of this mockup. This mockup was put into Microsoft PowerPoint to have transitions for the mute icon and video feed hiding. This, in conjunction with Tobii Gaze Trace to see where the actor is looking at any given time, is how we used Wizard of Oz to pretend as if we had a working product. We had two participants take turns being the "actor" and the "observer". The actor would have a one-minute back-and-forth dialogue with an imaginary second caller to test having the microphone mute when not looking at the other person. Afterward, they would get up from their seat and walk away for a brief moment before returning to the call. This is to test the interaction of having the video and microphone disabled when a user is not present. Finally, they would leave the call by clicking the "Leave Call" button. During this, the observer will be taking notes of what is going on and provide what-if scenarios while the actor is in the scene. We later made a rudimentary prototype of these interactions in Unity using the Tobii SDK to test the notes given by the two participants and see what does and does not work.

III. Results and Discussion

The results we obtained both from the bodystorming session and the non-immersive prototype we created in Unity reaffirms that the microphone muting and video disabling interactions are the best actions to automate using eye-tracking. Shifting our scope to a one-on-one discussion has also proven to be a good idea, so as to not overwhelm the user's eyes with so many objects (faces) to focus on. Our approach to integrating these actions in a natural way needs some tweaking, however. We have gotten useful feedback from the point-form notes taken by our bodystorming participants. See Figure 4 to read them in detail. The most important takeaway from this session was how we would get users to confirm selections using only eye-tracking. Initially, we wanted them to blink once or twice to act as a proxy for single or double-clicking buttons. This would be used for things like leaving the call or manually muting yourself. Our participants noted that having to click buttons several times throughout a call could cause the user's eyes to experience fatigue. This is especially apparent when you think of someone like our persona, Phil, who could have several calls a day with different clients. When prototyping in Unity, we decided it made more sense to have the user stare at an element of the interface for a certain amount of seconds to select it, and have a confirmation dialog appear in certain interactions (like leaving the call). This delay allows the user to experience fewer false positives and be absolutely content with the action they are taking. It was also agreed that keep the middle 1⁄3 of the UI focused on the other caller's video feed, with your own video feed appearing in a smaller form underneath. This is to keep the view clean and have it so there is no conflict for attention when navigating your screen.

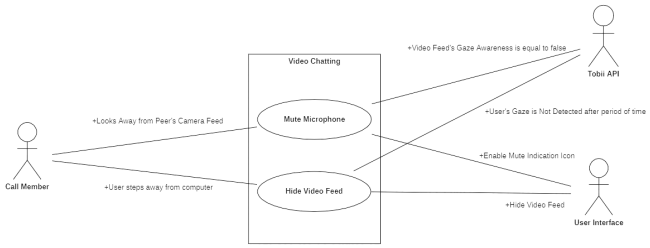

Fig. 1. Use case diagram of the two situations acted out during the bodystorming session.

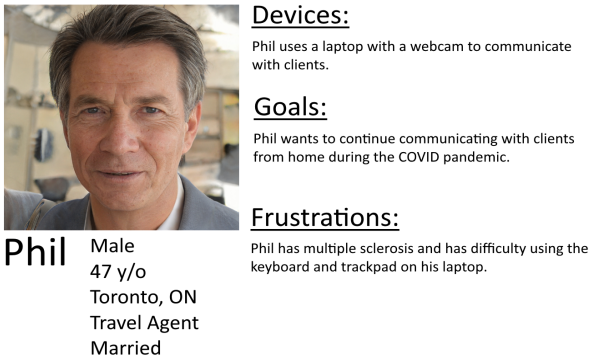

Fig. 2. The persona for the use case presented during the bodystorming session.

Persona face created using ThisPersonDoesNotExist.

(https://this-person-does-not-exist.com/)

Fig. 3. Static screenshot of mockup UI used during bodystorming session.

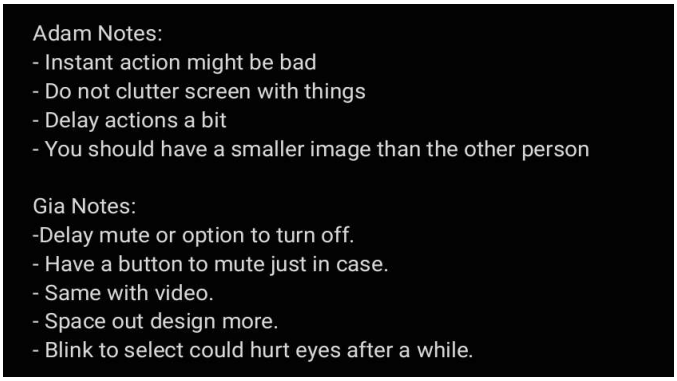

Fig. 4. Notes taken by both participants during their time as the ”observer”.

Tobii Integration SDK provided by Tobii AB.