MyePlay

Designing for Locked-In Syndrome

When we were designing the experience, interaction, and interface, we were faced with an interesting problem. Bob's, as our main user, eyes are mainly restricted to vertical movement, and although a few eye-tracking applications have been made for people with LIS, Bob's involuntary flutter in his left eye has left him unable to use these already existing applications. Aside from Bob, people normally do not have to use their eyes use their eyes for more than simply noticing and looking at something, which means this application would be specially geared towards not only Bob, but those who actually do not have their full bodily capabilities. These users often truly rely on technology to assist them in performing normal operations, as opposed to those who do have fully functioning bodies who most only use technology to enhance their lives. Having the chance to design for people with bodily limitations is important because designers usually only design for people whom society deems "normal", but has neglected those who cannot fit that standard. Designers have often not chosen to focus on these users because they do not have full capabilities, and it often limits what kind of interactions can be designed into the system. What is intuitive and easy to use is different for each of the different kinds of users. However, we do not see these users as limitations, but rather new possibilities for a new user interface, new user experience, and interactions. This opens up new possibilities to rethink already existing functions and purposes of the different parts of the users' bodies, because people with LIS must learn to use their eyes for more functions and purposes than people with full capabilities usually need to. Although studies [Roda and Thomas 2001] have shown that using the eye for more than attention creates more problems and errors, we believe that MyePlay has been able to redefine the eye's purpose and function. The eye is usually seen as a passive way to indicate visual attention, but MyePlay creates the new possibility of using the eye as an active decision maker.

First Prototype Design

Our original design includes a combination of a vertical spiral and the flat button design. The reason for our vertical spiral comes from the need to make the interaction with the menu intuitive for Bob. We chose a vertical design based on the Bobs limitation of only vertical movement. We also chose the spiral because a spiral implies continuity in the menu, making it intuitive to think of the menu of a continuous cycle, where the user can also look up and down to move the menu. We also needed to making only one option available at a time, since it would increase the accuracy of the user being able to choose the right option and prevent the number of errors the user can make. Studies have also shown that many errors are usually made with using attention as input, since eye movements are often involuntary and easily distracted.

The spiral design hints to the user about what the next incoming top and bottom options are in the spiral menu. We also used the spiral design for the possibility of more options than only games and the media player. Our first two options are the game, media player, and exit options. After the game option is entered, and a game is chosen (also in the vertical spiral design), and the menu switches to a flat button design to choose the number of players. We chose to switch to the flat design because there will only be two options in total for the number of players, and it will decrease amount of time and amount of interaction needed versus the amount of time and interaction with the vertical spiral design to get into the game. At the top of the users current screen, all the options the user had chosen would be displayed, to make the system status visible so the user will always know what they have chosen before and know where in the system they are exactly. If the media player option is chosen instead, the user will stare for two seconds at the top quadrant to pause the video, and a menu will drop down with a resume and exit option. To choose either option, the user will stare at the option for two seconds.

At the vertical spiral menus, the user will select the option by closing their eyes for two seconds, anda sound notification will occur to notify the user that he or she has been successful. An auditory cue is needed to at every successful action to notify the user that an action and change has been made, especially since the user will be closing their eyes. At the flat option

designs, the user will look at the desired option and blink twice, and their desired option will be highlighted with a light teal green. To continue with the option, the user will close their eyes for two seconds and a sound notification will occur to indicate success.

A highlight is needed to notify the user about what where the eyetracker and system thinks the user has selected, to prevent errors on the systems part, or to even notify the user about the systems error. To reverse or to go back, the user can look at the top part the screen and double blink at the system status. A double blink will highlight the display, to notify the user that he or she has chosen to go back. The user will close their eyes for two seconds and a sound notification will occur to indicate success. This is needed to give the user more freedom and control of the system, since users will often make mistakes.

Final Design

For our final design, we decided upon a single menu with all our options with a vertical spiral design. For our game, we implemented Pong, a computer game simulating a tennis game where the users bounce a ball back and forth with sidebars on their sides. For our media player, we chose to incorporate a personal automated playlist of videos from YouTube. In the spiral menu, the options include Pong and all the videos in the playlist. To move through the menu, the user will look down to get the next incoming option at the top. This is to simulate an intuitive action of pushing the spiral down. To enter into each option, the user will close their eyes for two seconds and a sound notification will occur to indicate success. Again, the sound notification is necessary at every successful action to notify the user that an action and change has been made, especially since the user will be closing their eyes. We also included a white cursor to indicate to the user where the eye tracker thinks he or she is looking, and red threshold lines to indicate whether the eye tracker will think the user is looking up or down.

After the Pong game has been entered, the user with the eye tracker will control the left sidebar in the game, and the second player, whether it be the computer or another person, would control the right sidebar. One of our goals of MyePlay was to foster social interaction with loved ones, and they would be able to interact with one another with Pong. To initially start, the user with the eye tracker can close their eyes for two seconds, or the other player can press enter. The user using the eye tracker will control their sidebar by looking up and down, and the other player can control their sidebar by pressing the up and down buttons. To pause the game, the user can look at the upper quadrant for two seconds and a menu will drop down with the options to resume or exit. The user will look at the desired option for two seconds to select the option.
If the user chooses to watch the videos in the personal automated playlist, the user will move through the menus to choose which videos have been saved previously. The user can select the video they desire by closing their eyes for two seconds and a sound notification will occur. Once they have entered the video, the video will automatically start playing. To pause the video, the user can look at the upper quadrant, and again, a menu will drop down with a resume and exit option, which the user can choose from.