Frets On Fire - One Switch Implemenations

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Introduction

The core objective of this project was to make Frets on Fire accessible to people with motor disabilities. We developed four one switch versions of the game. The remaining part of the report discusses different kind of strategies used in developing the four versions, how much modification we have made to the original game play in each version and also the results of the user case study that was performed.

Methods

The original Frets on Fire game involves using five Fret Keys and one strum key. The corresponding Fret keys need to be pushed down and held that way when the user notices an upcoming note on the screen and the strum button needs to be hit on when the notes are about to merge with the keys at the bottom of screen. Since the criteria for us was to develop a motor disabled accessible version of Frets on Fire, we decided to have a one switch versions of the game so that it would be easier for a motor disabled person to play the game as when opposed to the original version which involves the usage of six buttons. All the four accessible versions of the game that we developed use just one button.

Four different accessible alternatives of the game Frets on Fire were developed by us. These alternatives were Strum Only, Finger Selection, Color Only, and Tapping.

Strum Only

In this version, the strum bar is to be hit in time when a note is coming up on screen and is going to merge into the keys at the bottom of the screen. To deal with longer notes, the button needs to be held down for a longer duration.

Finger Selection

In this version, the strum bar needs to be pushed down until the finger on the screen points at the appropriate key and then the strum bar is to be released. The objective is to have the finger point at the correct key at the time the note merges with the key.


Color Only

In this version, the users get to choose the color of the note he wants to deal with, the remaining notes are played either by other players, who choose one colored note each, in multi player mode or the computer plays all the other notes in the single player version. The user hits the strum bar right when his note is about to merge with the appropriate key at the bottom of the screen while the computer or the other players do the same for their notes.
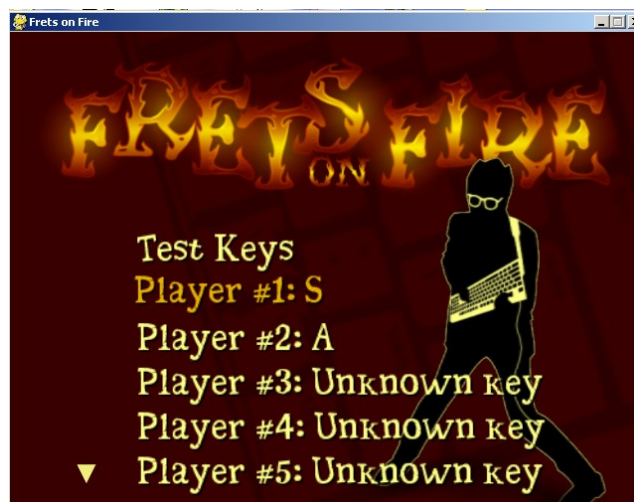
Tapping

In this version, the Fret # 1 button needs to be tapped to select one key after the other from left to right. When the correct key is selected the user can stop tapping so that the upcoming note merges to the selected key. The selected key flashes for a brief while to let the user know the current key selected. The objective here is to have the correct key selected in time by tapping for the upcoming note to merge into the correct key. All the above four accessible versions of the game that we have created are new strategies.
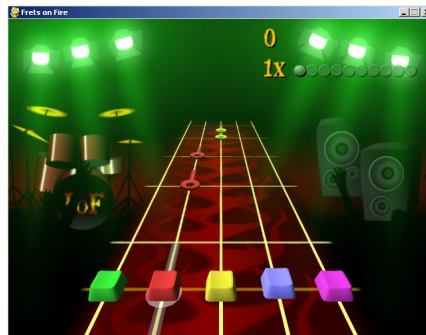
Purpose

The intention was to keep the original game play intact as far as possible because we did not want to lose on the fun element of Frets on Fire. The positive aspect of Frets on Fire is that it usually gives the users the feel of playing a guitar. So, we also tried not to dissociate that from the accessible versions of the game that we created. We think we were fairly successful in doing both of the above.

The strum only version of the game did not change the game play at all. The only thing that was changed with respect to this version was that the players could just use a single button in this version to accomplish all that can be done by the six buttons in the original version.

The changes made in the finger selection version of the game when compared to the original version of the game is that only a single note would merge with the corresponding key at the bottom of the screen at any point in the game. This would facilitate the usage of strum bar so

as to have the finger select the appropriate key but in the original game there are times when more than one note come up on the screen to merge with the corresponding key.

In the color only version of the game the user gets to choose and play only with a single colored note while the other players or the computer play with the rest of the notes but in original game a single user plays with all the notes of different colors.

In the tapping version of the game once again only one note merges with the corresponding key so that the user can tap the single button to choose the required key into which the note is likely to merge.

Case Studies

For user case studies, five participants played the original version of Frets of Fire and also the four accessible versions developed by us. After that the participants were requested to fill out a questionnaire that helped us understand what the participants experiences were with the accessible versions of the game.
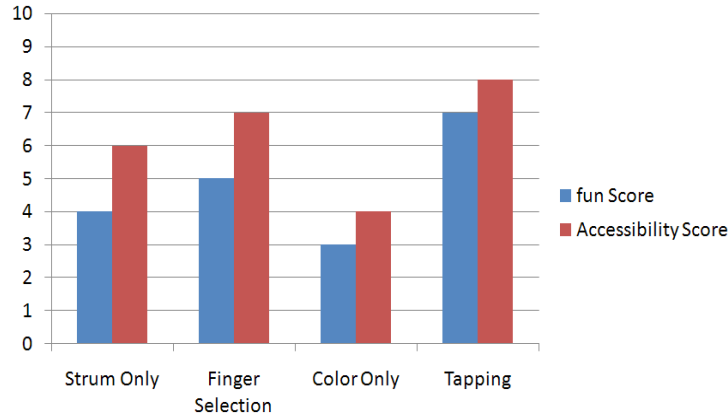
Participant #1

The answers given out by participant 1 in the questionnaire were that he enjoyed the Strum Only version the most. He thought that Strum Only and Finger Selection versions handled the issues of accessibility the best. He also gave out a suggestion to remove the fifth Fret. He thought that the Strum Only version best simulates the original game play style. He thought that Tapping and Finger Selection would be better if the songs were simpler or slower. According to him the accessible versions of the game gave him enough challenge to play more and he has not played Frets of Fire or any similar games before this experience. Below is a graph that indicates the Fun Score and the Accessibility Score given out for all the four versions by participant 1
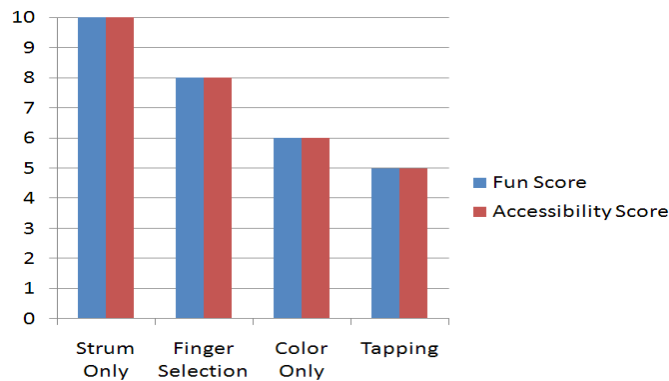
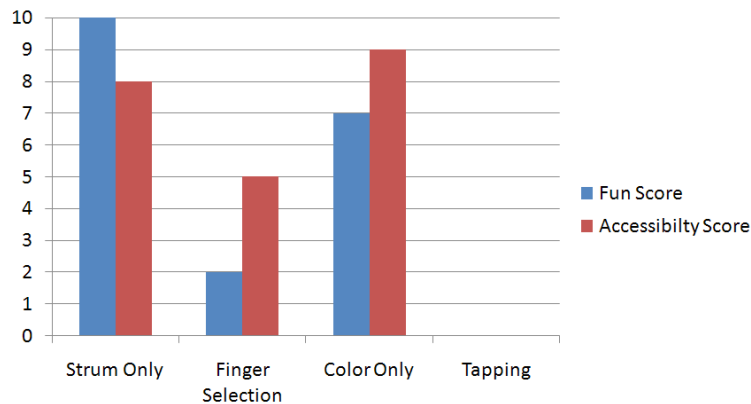*Graph for scores given by Participant 1 (1Low-10 High)*

Participant #2

The answers of participant 2 in the questionnaire were that he enjoyed Tapping the most as he felt that it was more challenging and easier to control as opposed to Finger Selection. He felt that Strum Only and Color Only were easier to use while they didn't handle all the functionalities of the original game but Tapping could do more though it was too hard. He also made a suggestion that there should be a circle indicating the current key selected in the Tapping game as in the current Tapping version it is easy to not know which key is selected currently. He also felt that the Tapping version simulates the original game play the best. If the songs were slower or simpler, according to him, Tapping version would become better. Tapping version gave him enough of a challenge to play more as it was fun for him to play while he felt that the Finger Selection version might bore people after a while. He played Frets on Fire before this experience. Below is a graph indicating the Fun and Accessibility Scores that he allotted to each of the four versions of the game.

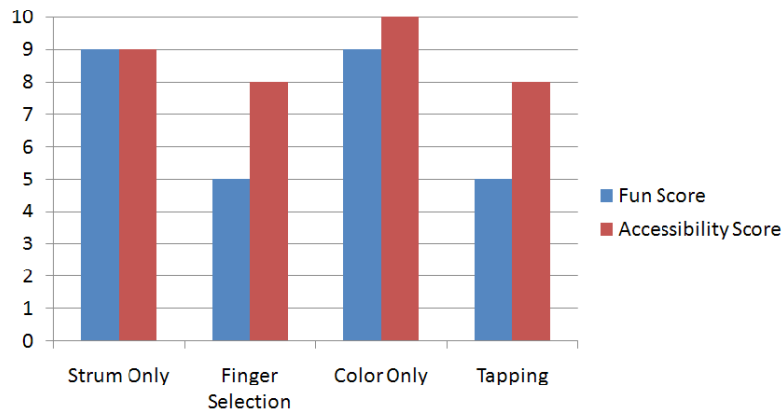*Graph for scores given by Participant 2 (1Low-10 High)*

Participant #3

Participant 3 enjoyed the Strum Only version the most while he felt that the Tapping Version handled the accessibility issues better. In his suggestion he asked us to avoid the Finger Selection mode. He thought that Strum only version simulates the original game play style the best. If the songs were simpler or slower, according to him, the Finger Selection version would be better. He said that he wanted to play the Strum Only version on harder songs, he also felt that the Tapping version was too tough and that the Finger Selection Version was annoying. He said that the Color only Version was really creative. This participant did play Frets on Fire before. Below is the graph of his fun scores and accessibility scores.

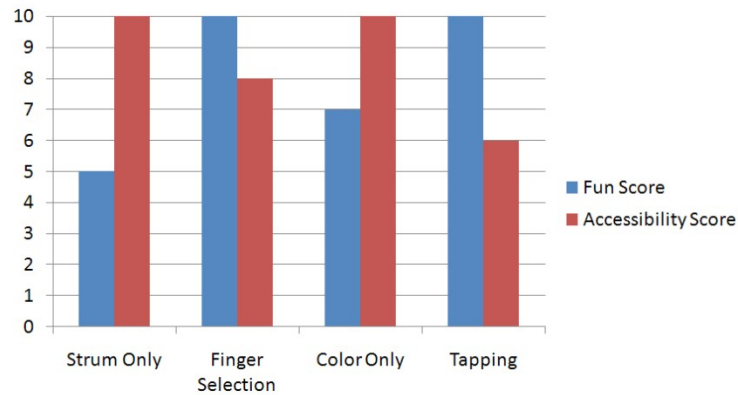*Graph for scores given by Participant 3 (1Low-10 High)*

Participant #4

Participant 4 enjoyed the Strum Only version the most and felt that the Tapping version handles issues of accessibility the best. The suggestion given out in this case was that in the Finger Selection version the selected key should move to both the left and right rather than only to the right. Strum Only Version best simulated the original game play style according to this participant. The participant felt that all the versions gave out enough challenge to play more. This participant had not played Frets of Fire or any similar games before this. Below is the graph for this participant.

Graph for scores given by Participant 4 (1Low-10 High)

Participant #5

Participant 5 enjoyed Finger Selection and Tapping versions the most and felt that Strum Only and Color Only versions handled the issues of accessibility the best. The suggestion given by this participant were to highlight the selected key in the tapping version and to have the keys selection cycle move both to the left and right instead of just to right in the Tapping and Finger Selection Versions. Participant felt that all the versions simulated the original game play style. Finger Selection and Tapping gave enough challenge to play more according to this participant. This participant never played Frets on Fire or any similar games before. The graph for this participant is given below.

Graph for scores given by Participant 4 (1Low-10 High)

Conclusion

The most common suggestion seemed to be to have the key selection cycle move both to the left and the right rather than to right only in both the Tapping and Finger Selection versions. Also, different participants reacted in different ways to Tapping version. Some felt that it was fun and challenging to play while the others felt that it was annoying. The results of the user case study show that all the four versions were quiet usable. We have also made sure that all the aspects of the games are accessible, like the menus can also be accessed using a single button. We have used scanning mechanism to accomplish this. Thus, over all, all the four accessible versions perform well.