

A Computer Game Using a DDR Pad for the Visual Impaired

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1. Introduction

Since the ubiquitous computer era, we are using computers very much part in daily life. But there have been only barely considerations for the visually impaired. Some argue that efforts to address these issues, but the use of computers for visually impaired people still limited. In this paper, we redesigned the original Tetris game. This game for the visually impaired is played the games with using only the hearing or touch senses [1].

2. Design a Computer Game for the Visual Impaired

2.1. Setting up a System

Requirements of Tetris for the visual impaired are as follows. (R1) Visual impaired people's eyes are not good or not visible. It must be able to using the senses other than vision. (R2) Visually impaired people with low vision are tried to a many game than blind. The adjustment of the degree of difficulty is important. (R3) Using a part of DDR pad, because they have a big movement is difficult.

2.2. System Design Using Sound

Visually impaired people are get information through sound, smell, hearing, such as temperature, utilizing the sense of touch, etc. [2] [3]. Among the most easily implemented by utilizing the computer using a sound for the visually impaired to Tetris game is based on the following principles were designed. (1) Window that configured the games has 5 rows of 10 column screen. (2) When the game starts, the speaker sounds left or right sound. (3) The direction of the sound effects you hear and press your pad button with your foot. When direction of the sound match the pad button, you hear sound effects and window piled bar. When direction does not match, you hear sound effects again. (4) When bars on all screens are full, the game is ends.

2.3. System Design Using DDR pad

There are many constraints on the actions of everyday life because Most of the disabled people have physical defects. So they easily occurs 'lack of exercise' disease and lifespan is significantly lower compared to non-disabled people [4]. Tetris for the visual impaired people designed using a DDR Pad for help their exercise. (1) Connect the computer and the DDR pads. (2) The cursor keys on the keyboard to match the start button are set to be connected using 'Xpadder' program. (3) Pad's left and right directions of buttons are informed the sticker is attached to the skid stickers.

3. Experiment and Evaluation

3.1. Experiment

Obtaining the graph through test and interview as follows.

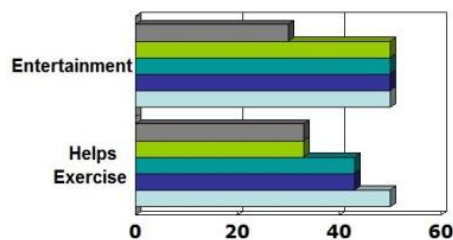


Figure 1. (Graph through survey. Total score is 50.)

The game was connected to on the big TV screen because experimenter to easily enjoy games. The number of experimenter is 5. Student conducted survey after have played game. In survey results, the majority of the experimenters are responded interesting this game than original game through the keyboard. And about half of the participants answered that this game is helping our exercise.

3.2. Evaluation

Obtaining the result through test and interview as follows. (S1) Blind participants have never been played Tetris, on the other hand participants that has low vision seen ever played game. So this game is needed adjust the difficulty level. (S2) Requiring is Variety of shapes and blocks of color, diversity. (S3) The block increased rate of decline. Because fall slow blocks game is bored. (S4) There is a direct block down button on the back of the pad, it is inconvenient. (S5) Use sound is listened comfortably.



Figure 2, 3. (Experimenter test)

4. Conclusion

The visual part of human life accounts majority. The most games played through using the visual sense. The game for the visually impaired was developed rare. Therefore they suffer many limitations from playing the old game. Amenities and environment for the visually impaired have been developing, but a lot of people's eyes still lack of care for them. So, this study is only for them. This paper presents the development and implementation of Tetris game for the visually impaired people and interview was conducted after the test when visits visual-impaired-school. We could see much different idea through interviews with visually impaired. Generally most people think the visual impaired can not see anything, but they're having a much higher proportion of low vision. So, in this experiment using a big TV screen and a visible color set, they playing Tetris was possible without difficulty. This is unlike many developers think the game can be designed a little easier to care for them. Their learning and exercise can help research is needed to continue for a variety of content.

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