The Use of Digital Media in Computational Design Process of Synesthesia Spaces

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ABSTRACT

This research focuses on the computational design process of synesthesia spaces. Within the scope of the knowledge-based design, a system is developed with inputs and outputs. Two of the five human senses, sight and hearing are selected as the inputs, and the 3D output is generated to express the two input senses together, which is printable, and the generated expression can be perceived by touching. In this way, the system can detect the data from digital media such as music or movie and produces 3D models to be perceived by touch. This system enables the transformation of video inputs into 3D models and is a prototype and needs to be developed further to improve the ease of use. So, the interaction with media sources via touch becomes possible at the end of the process. Also, synesthesia exhibition areas can be created by using this program. It is assumed that the experience of digital media by different senses can bring another dimension to the exhibition work. Moreover, it may also make possible the visual and hearing-impaired people to interact with digital media differently.

KEYWORDS

Knowledge-based Architectural Design, Synesthesia, Exhibition Design, Computational Design.

1 INTRODUCTION

Synesthesia is an unusual blending of the senses in which the stimulation of one modality simultaneously produces a sensation in a different pattern. In other words, synesthetes hear colors, feel sounds and taste shapes [1]. Synesthesia Spaces Project is an idea of the exhibition area design which is created with the help of different senses. For instance, a work that should be viewed through eyes and listened with ears can be felt and perceived by touching in this synesthesia exhibition area.

As the method of the study, Processing (Version 2.2.1) has been selected, so that sound and video files can be processed to generate an output compatible with 3D modeling programs for the fabrication process.

Minim library was used for the processing of the sound [2], DXF library was used for the output of the 3D model and Processing video library was used for detecting the video input. Adding that, ControlP5 and javax.swing libraries are used for the user interface design and development. In the end, the DXF files are created by using 3D modeling technique through Rhino program.

2 SYSTEM DESIGN

The digital media files in MP3 and MOV formats are processed in Processing and transformed into DXF files as a 3D model (Figure 1). At first, the soundwave values from the sound file determine the z axis values of the 3D model. At the same time, a frame is captured from the movie file at each second. Then, the hue and brightness values of these frames make the x and y axis values of the 3D model. A DXF file can be generated by using the "record" button at any time while the MOV, and MP3 files are being processed.

Figure 1: The Interface of the Prototype

3 CONCLUSION

This prototype provides users a system to create 3D models from sound and video files. The created 3D models are printable via a 3D printer or projected via various projection tools & technologies to the desired surface or places. This script can also help people to create different interaction methods for digital media. Instead of listening to a piece of music or watching a movie, people can perceive the music or movie by touching and feel it. Besides, this new way of interaction can be beneficial to visually- and hearing-impaired people.

REFERENCES

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