THE TECHNICAL AND AESTHETIC VIEW OF THREE TAIWANESE LANDSCAPES FOR MULTIMEDIA MUSIC

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ABSTRACT

The multimedia music piece "Three Taiwanese Landscapes" was composed in November of 2007, by Taiwanese composer Chih-Fang Huang. The main idea was inspired by the famous scenes of Taiwan. The composition techniques differ from the conventional music concrete techniques, but use the abstract materials instead, including the digital synthesized graphics with the "self-similarity" features derived from fractal and chaos theory, to integrate the computerized sound samples with proper transformations and sound synthesis. In addition he algorithmic composition with probability and distribution control are used for the various "sound shapes" sculptures, to complete the computer music piece with multimedia concrete.

1. INTRODUCTION

"Three Taiwanese Landscapes", composed in October 2007, had its premiere performance in November 2007, Taipei, Taiwan. It was also performed on October 30, 2008, at Musicacoustica-Beijing Festival. The main idea is to integrate computer music with animation, using fractal image, algorithmic composition with sound sample transformation, to express the abstract audio-visual art. Fractal emphasizes the basic concept of "self-similarity" [1, 2, 3] which can be used to generate a series of still images, to construct animation with a unified artistic thinking. The animation part of "Three Taiwanese Landscapes" is totally derived from fractal, and put all of the computer-generated images into the video sequencer software, to make an abstract animation to express the impression of the landscapes.

In music composition of "Three Taiwanese Landscapes", I integrate both music concrete [4, 5, 6] and algorithmic composition [7, 8, 9] to generate the electroacoustic music with a hybrid composition of MIDI-rendered audio and sample-transformed sound. The innovated multimedia sonic art can be performed in a concert hall with simply a computer, stereo sound system, and a video projector. The animation design is basically followed by the music tempo and rhythm, however both video and music is not strictly synchronized, with a looser and wider interpretation of audio-visual fusion.

2. AESTHETIC CONCEPT

The main idea of "Three Taiwanese Landscapes" composition is to use both computer-generated sound and graphics, instead of acoustic instrumental sound and real image, to pursuit an abstract internal idea behind the landscapes.

The artistic conception of the piece "Three Taiwanese Landscapes" is as the following description into movements:

Movement 1 "Blowing Sand": Laying down the beach and watching the invisible world, we enjoy the colorful sky and golden sand in the breeze, to fuse the sunlight with gorgeous colors into a whole.

Movement 2 "Starry Sky of Kenting": To look up to watch the starry sky of Kenting while walking along the seashore, the shooting stars suddenly appear and break the silence of the earth, to brace my fantasy and hope into a dream.

Movement 3 "Drifting Snow of Ho-Huan": In the chilly winter, there are drifting snowflakes all around the top of Ho-Huan Mountain. With all kind of transformed shapes stared, it seems to guide me to walk into an imaginary world with great wonders.

3. FRACTAL IMAGE

In the video part, we used "Chaos Pro" [10] to generate each frames of video. "Chaos Pro" is a program which used fractal theory to calculate the graph lines and colors. The idea of the fractal iteration can be written through the simple formula for Bifurcation diagram:

$$X_{n+1} = a * X_n * (1 - X_n) \tag{1}$$

$$0 \leq X_n \leq 1 \text{ and } 0 \leq a \leq 4$$

It's the recipe for an extremely complicated output, therefore the fractal image can be generated automatically with both self-similar and self-evolved features.

4. ALGORITHMIC COMPOSITION

In the music technology part, I used "MusicSculptor" [11] program which was developed by Professor Phil Winsor. The program generates the music through

automatic parameterized algorithmic composition, and takes the music do inversion, retrograde and development with variation. All of the music generated by the automatic composition system MusicSculptor to produce a stream of musical data with pitch, velocity, rhythm, articulation, and timbre settings, can be controlled by probability distribution table. For instance, the beginning theme of "Three Taiwanese Landscapes" is generated by the atonal style theme setting, with proper operations of the program, and the probability distribution table is shown as Figure 1.
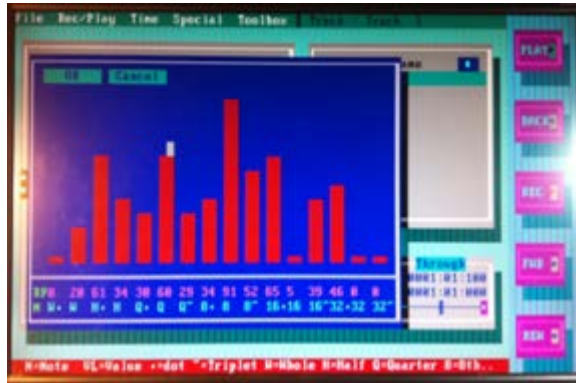

Figure 1. MusicSculptor Program Interface

5. COMPARISON OF THE REAL IMAGE AND THE FRACTAL IMAGE

The comparison between the real image (photo) and the fractal image (computer generated) is very interesting. The computer-generated fractal images may be not very similar to the photographic ones, however it conveys an abstract idea of the works behind the title with even more meanings with imagination. Figure 2 to Figure 4 (a and b) compares the screenshot fractal images and the photographic images.
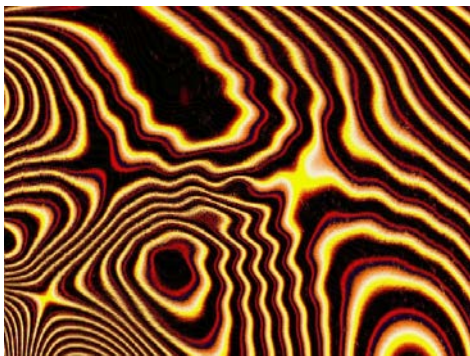

Figure 2a. Fractal Image Example of "Blowing Sand"

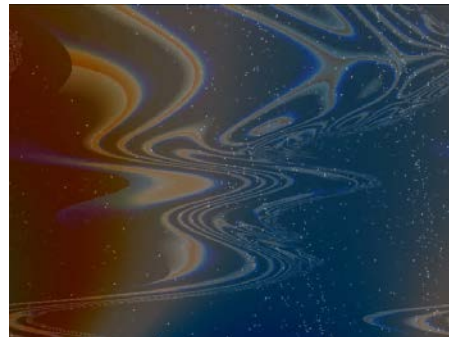**Figure 2b**. Photo of "Blowing Sand"

(Kenting National Park Website: http://www.ktnp.gov.tw/cht/theme.aspx?type=2&themeTourID=19)

Figure 3a. Fractal Image Example of "Starry Sky of Kenting"

Figure 3b. Photo of "Starry Sky of Kenting"

(Kenting National Park Website: http://www.ktnp.gov.tw/cht/trip.aspx?dayclass=6)

Figure 4a. Fractal Image Example of "Drifting Snow of Ho-Huan"

Figure 4b. Photo of "Drifting Snow of Ho-Huan"

(Sun Moon Lake National Park Website: http://www.sunmoonlake.gov.tw/TW/04001120.aspx)

The process of "Three Taiwanese Landscapes" composition is based on Figure 5, to construct a integrated audio-visual multimedia piece accordingly.
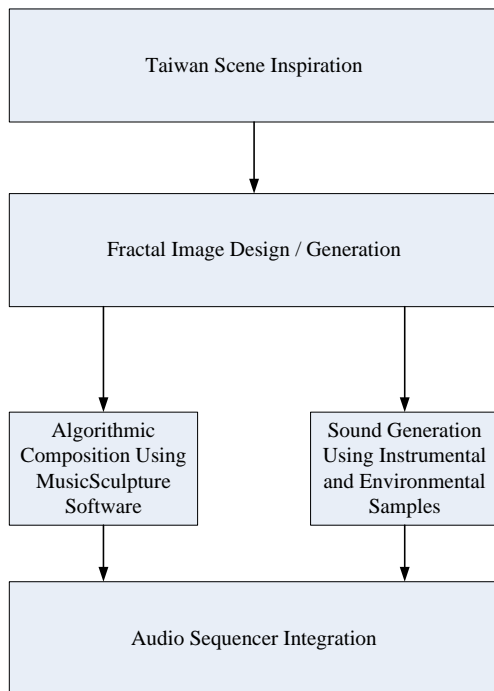

Figure 5. Multimedia Music Composition Process

6. RESULT

In addition to the indeterminate and algorithmic composition idea for the note-level consideration, some sound samples including acoustic instrument and machine sound can be integrated with an audio sequencer. The texture contrast is also an important issue while composing. The final result of "Three Taiwanese Landscapes" composition is consisted of fractal animation, algorithmic composition audio, and transformed sound samples, and the audio sequencer can be used as the "Montage" effect of the audio-visual composition with juxtaposition of artistic thinking. Figure 5 shows the Human Computer Interface (HCI) of the audio program for the piece composition to integrate the fractal animation.
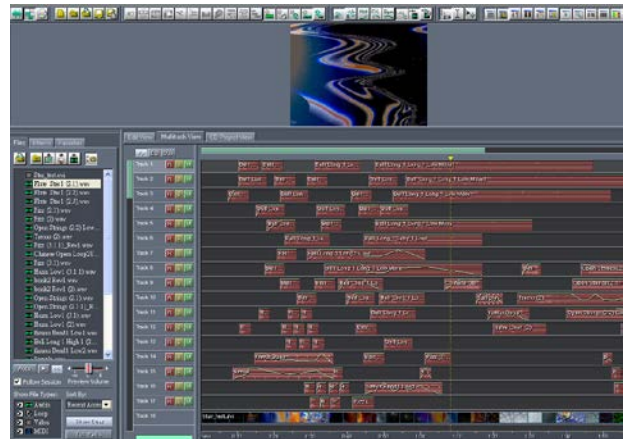

Figure 5. The HCI for "Three Taiwanese Landscapes" Audio-Visual Integration

7. CONLUSION

"Three Taiwanese Landscapes" is a new attempt to develop the possibility to fuse both audio and video using algorithmic composition and fractal animation, therefore it creates a greater space for both sides of composition and listening with brand new experience. Music form is not stationary, and the electroacoustic music composition can involve both note-level algorithmic composition and audio-level sound sample transformation. Hope this piece can bring the listeners a broader thinking of the integration of sonic art and visual art in an abstract way.

8. ACKNOWLEDGMENT

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