

Sound and Video Recording for Chinese Classical Garden's Soundscape Database

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(Received 30 November 2009; accepted 7 December 2009)

There are many invaluable soundscape resources in existing Chinese classical gardens. In order to provide a basic knowledge for protecting these soundscapes, a comprehensive understanding of Chinese classical garden is necessary, and one of the basic works for this is the establishment of an audio-visual database. The sound and video recording of most Chinese classical garden's soundscapes was carried out from March to August in 2009. The recording strategies and techniques are introduced in this paper. Physical characteristics of garden sound are recorded, and the methods of constructing a unique soundscape conception are also explained.

1. INTRODUCTION

In previous papers, the authors have pointed out that Chinese classical garden's soundscape designers not only focus on the control of sound in physical manners, but also focus on how to express human feelings through sound, and try to unite vision, hearing and other factors to achieve an artistic conception which could conduct people to a peaceful state. [1] [2] [3] [4] Therefore, only recording the physical characteristics of garden sounds can not express the unique soundscape conception of Chinese classical garden, so exploring a methodology to record the physical characteristics of garden sound, and also express its artistic conception is necessary.

This paper starts with a brief description of the methodology about establishing such an database of sound and video of Chinese classical garden's soundscape resources, then gives the technique details which are used in the sound recording and video capturing from March to August in 2009, the methods of constructing a unique soundscape concept are also explained.

2. Methodology

For showing the unique characteristics of the soundscape of Chinese classical gardens, the sound and video recording for the database should include two levels as below (Figure 1):

First, the physical recording of soundscape, which includes digital sound recording, spectrum graphs, sound pressure level, and video clips of soundscape. This part of work describes the physical facts of the site and should be strictly done in accordance with scientific norms, so that it can become a fundamental work for further exploring the

protection of Chinese classical gardens' soundscape resources and for further study.

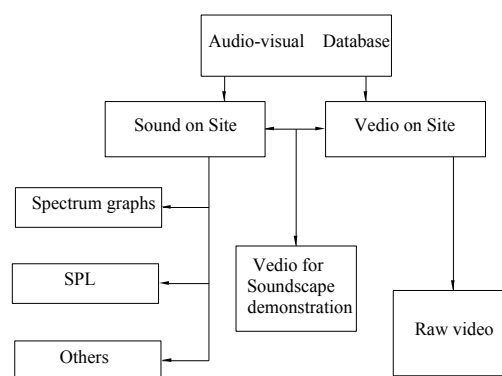


Fig.1. Schematic diagram of Audio-visual database

Second, the artistic expression of soundscape. As the Chinese classical garden's soundscape was formed gradually under the background of a unique Chinese culture, and was refined from practical and artistic construction techniques, it retains high artistic and culture value. Expressing correctly the contents of the soundscape of Chinese classical gardens can be a guideline for the understanding and realizing the concepts of soundscape, and it is also a basic task for the audio-visual database establishment of Chinese classical garden's soundscape. On the other hand, for the lack of protection, the garden soundscape resources in China are destroyed seriously. Environments around the resources are also changed as cities are developing. Hence only the on-site recording cannot clearly express the original concept as the garden designer wanted to express. Therefore, to recover the soundscape, both documentary and subjective understanding have to be combined. For instance, for those resources which are in good protection, direct editing and processing can be made for the on-site recording sound and video clips, depending on their different concepts; and for those resources which are under

seriously destruction, recovering their soundscape can be realized by using computer graphics simulation and auralization techniques. In summary, the aim of this part of work is to express the garden designer's original concept by choosing suitable technical methods based on culture background.

3. SOUND RECORDING

3.1 Recording Sites

The recording sites for audio-visual recording are within JiangNan area, where most Chinese classical gardens' Soundscape resources are located and are relatively complete. The resources within this area include almost all the themes of classical garden soundscape, and they are pine wind, bamboo wind, raining above banana and lotus leaves, waterfall, trickle, bell ringing, Buddhism humming, bird singing, and classical musical instruments etc. This part of recording can become a foundation and experience accumulation for a complete database construction of Chinese classical garden soundscape .

3.2 Equipments for Sound Recording

Stereo sound recording equipment of high directivity is used, for the recording objects are highly related to some simple audio elements, and a relatively high S/N ratio can be achieved. And for the expression of an artistic concept of the soundscape, stereo recording has some advantages to only one channel recording.

Signals were pre-processed before they are recorded digitally in the computer. Analogy signals were pre-amplified by a mixer after the stereo recording, and AC/DC conversion was processed by an external sound card, with the format of 16bit/48kHz (Fig.4). Recording software is AUDITION2.0, by which the recording process was able to be monitored. The setup of recording system is showed in Fig.4. SPL was also measured by AWA6218B which was calibrated by B&K4228 before. A detail list of equipments for sound recording(Fig.2) are as follow:

- 1) Portable Audio Mixer: Sound Devices 302
- 2) RF Condenser Microphone: Sennheifer MKH418-S
- 3) USB AudioCapture: Roland UA-25EX



Fig.2. Sound recording equipment

For the protection of equipment from unrelated noise, some extra protection procedures were adopted(Fig.3).

- 1) Modular Windshield Kit: Rycote 4KIT
- 2) 3.9M Shaft: VDB L-NL



Fig.3. Windshield Kit and Shaft

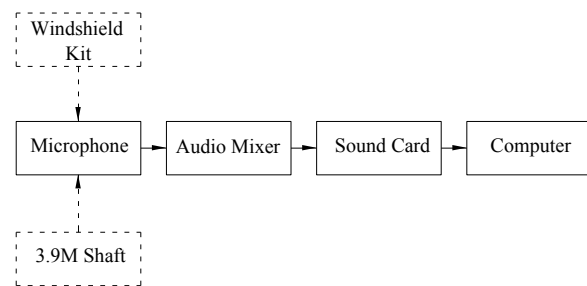


Fig.4. Diagram for equipment setup

3.3 Sound Recording

Repeat recordings in the main sites of JiangNan area were made during the period between March to August of 2009. In order to avoid various unrelated environment noise, recording time was chosen when visitors were absent, that is between 6a.m. to 8a.m., and 5:30p.m. to 7p.m., and recording seasons were chosen according to various soundscape themes, for instance, bird singing was recorded in March of spring, raining sound of banana trees was recorded in August. The windshield kit was put on the microphone under the conditions of strong wind or rainy, and a long shaft was used to extend the microphone to the distant locations Fig.5 is the working scene at TianPing mountain of Suzhou, where the sound of vibrating pine leaves was recorded. In order to distinguish such sound and other sound of grass, a 3.9 meters shaft was used for the recording. The windshield kit was put on to get rid of the wind too. Fig.6 and Fig.7 are signals of pine wind sound and their spectrum which are recorded at TianPing mountain of Suzhou.



Fig. 5 Recording site

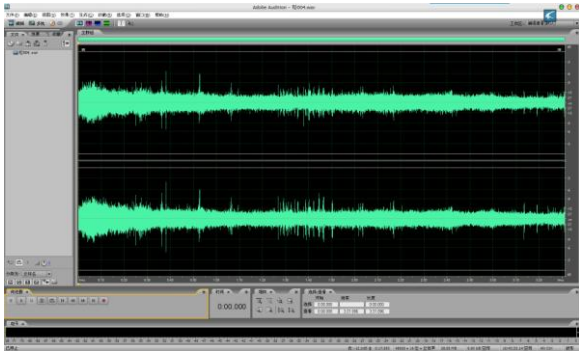


Fig. 6 Sound signal

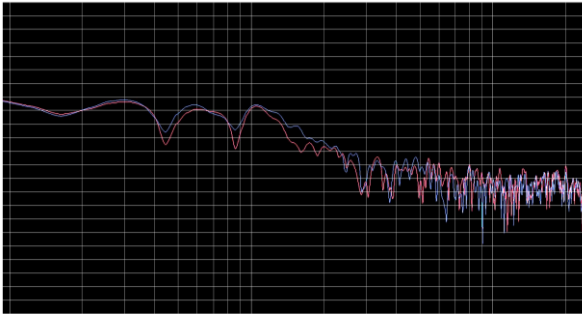


Fig. 7 Spectrum

4. VEDIO RECORDING

4.1 Equipments for Vedio Capture

Sony HVR-A1C high definition video recorder was used as the recording equipment. It has the advantages of small size and a line-in input, where the microphone of high directivity as mentioned above can be connected to it (Fig.8) .



Fig.8. video camera

4.2 Vedio Capture

Video capture was also made at the same time when sound was recorded during the period of March to August of 2009, at the main soundscape sites of JiangNan area. Fig.9 shows the working scene at Han Mountain Temple of Suzhou. Video clips were saved as the HDV format on the magnetic tape, and they were transformed to AVI format on the computer for the resource of database.



Fig.9 Scene of video capture

4.3 Vedio Editing

Based on the concepts expressed by the soundscape resources, an outline was designed to edit the captured video clips. Premiere was used as the video editing tool (Fig.10) . Raw video clips were imported to be edited based on the outline as mentioned above, and a complete demonstration video was made. Video was dubbed with on-site recorded sound based on the soundscape concept, so that the audio-visual clips are in accordance with the desired concept.

Furthermore, additional poems, background introduction were dubbed with the video to make the concept of the soundscape more accessible.

Fig.10 Premiere interface



Fig.11 Stay and Listen Pavilion



Fig.11 shows one of the complete vedio of Stay and Listen Pavilion in ZhuoZhengYuan garden, the soundscape concept is from the famous words "Leave and withered lutos to listen to the rain" by Li ShangYin of Tang Dynasty. When the sound of rain dropping on the leaves, adding special state of poems and

autumn rain with nostalgia vein. it is another picture looking at the scene and listening to the rain.

The completed video was replayed by stereo monitors in the listening room (Fig.12). Tow Mackle HR 824 loudspeaker and external soundcard used for recording was also used in the playback.



Fig.12 Video Replay

Based the recorded resources and post-processed audio-visual clips, the anticipated achievement was made.

5. DISCUSSION

For the recording sites are mostly well preserved gardens, the post-processing procedures include only the regular editing of raw material, computer graphics simulation and auralization techniques are excepted. Based on the above resources, future work will be space mapping of the soundscape, which will be the precondition for the computer graphics simulation and auralization.

This research is supported by the National Natural Science Foundation of China (50878085). The authors thank Peng Ran and Zhou Hong-yun for their assistance in field work, Gong Hui-zhe for equipments buying and Xian Jia-lin for vedio editing. The principal author also thanks for the financial support of the 111 Project 111-2-13 for sponsoring her attendance at The 4th International Symposium on Temporal Design Conference.

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