

SWAF: Towards a Web Application Framework for Composition and Documentation of Soundscape

Souhwan Choe

Dept. of Digital Contents Convergence
Seoul National University
Seoul, Republic of Korea
virii47@snu.ac.kr

Kyogu Lee

Dept. of Digital Contents Convergence
Seoul National University
Seoul, Republic of Korea
kglee@snu.ac.kr

ABSTRACT

In this paper, we suggest a conceptual model of a Web application framework for the composition and documentation of soundscape and introduce corresponding prototype projects, SeoulSoundMap and SoundScape Composer. We also survey the current Web-based sound projects in terms of soundscape documentation.

Keywords

soundscape, web application framework, sound archive, sound map, soundscape composition, soundscape documentation.

1. INTRODUCTION

Soundscape research was initiated by Schafer [4] during the late 1960s and early 1970s with the aim of enhancing our acoustic environment and human awareness of surrounding sounds. In music, soundscape composition often refers to electroacoustic music which is composed by organizing environmental sounds. Truax [5] described the term soundscape composition as a continuum of “‘found sound’ representation of acoustic environments through to the incorporation of highly abstracted sonic transformations”. In contrast, soundscape as a documentation of sonic environments is a new perspective to artistic expression. Soundscape is not only a record of acoustic phenomena, but also an aggregate of cultural, social, and historical events of a specific place at a specific time. Thus, the practice of documenting sonic environment is a creative activity of narrative writing with sounds.

From the beginning of the Web in 1990s, the Web space has been regarded as one of the important places for artistic practices with its intrinsic capacity of telepresence [1][2]. Online map services and their Open APIs (Application Programming Interface) stimulated the development of interactive sound maps and map-based sound archives on the Web such as UK SoundMap¹, London Sound Survey², Open Sound New Orleans³, SeoulSoundMap⁴, and Sons de Barcelona⁵. Urban Tapestries [3] project is an attempt to incorporate elements of social research into creative projects merging the concerns of art and design with social science. SoundTransit⁶ is another noticeable Web-based audio project that presents new possibilities of the employment of the Web for the sonic experience by providing the visitors with a sonic journey adopting a metaphor of a flight trip.

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NIME'11, 30 May–1 June 2011, Oslo, Norway.
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2. SWAF (SOUNDSCAPE WEB APPLICATION FRAMEWORK)

SWAF (Soundscape Web Application Framework) is a conceptual framework for soundscape composition and documentation. The purpose of this framework is to provide various features such as signal processing, music composition model, ontological sound classification, database management, and user interface for archiving, navigating, composing, and listening to soundscapes.

2.1 Overview of SWAF

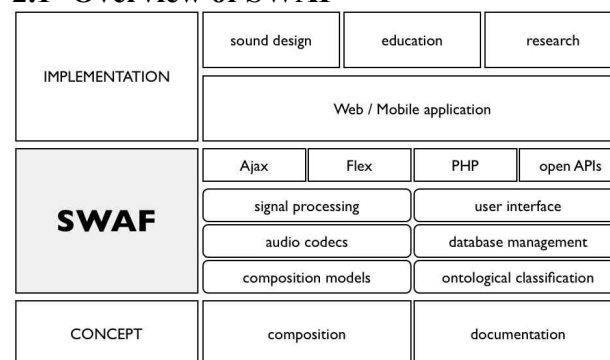


Figure 1. Overview of SWAF (conceptual model).

The development of SWAF focuses on two aspects: composition and documentation of soundscape as artistic practices. In this respect, the core of SWAF consists of four modules including *Archive*, *Navigator*, *Composer*, and *Community* as illustrated in Figure 2. *Archive* is a module for the management of archived recordings, and thus it usually works in the background to analyze and process the information of each sound and sound itself. In the *Navigator* module the audience can explore soundscapes in various ways, for instance, by a map interface, chronically ordered list, and list by a keyword. *Composer* is similar to a music production application in its functionality; users can compose their own music (or virtual soundscape) by selecting and organizing sound objects from *Navigator* with some sound effects. *Community* is a place where users can share their own compositions and discuss on soundscape and its relevant topics. The prototype of *Navigator* and *Composer* modules have been implemented in the following projects.

¹ <http://sounds.bl.uk/uksoundmap>

² <http://www.soundsurvey.org.uk>

³ <http://www.opensoundneworleans.com/core>

⁴ <http://som.saii.or.kr/campaign>

⁵ <http://barcelona.freesound.org>

⁶ <http://www.soundtransit.nl>

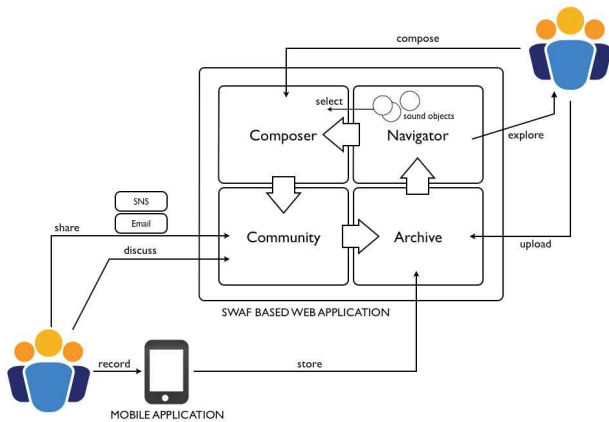


Figure 2. A model of a SWAF-based Web application.

2.2 SeoulSoundMap

SeoulSoundMap is a project to build a collaborative archive of soundscape in Seoul. We utilized several Web technologies for interactive user experience in the development of the project website. Anyone can contribute to the archive and explore the archived soundscapes as well in a geographical or chronological way. If the user wants to share the sonic experience, it is also possible to share any recordings on Twitter.

The website is implemented by mashing up Google Maps, Audioboo⁷, and Ajax. Users can collect an instant soundscape in real time using an Audioboo's mobile application, then send the recording with a predefined tag to Audioboo's server. When the webpage is loaded, a PHP script retrieves relevant sounds from Audioboo and shows the retrieved recordings on Google Maps with a marker according to their geographical information. The information window on Google Maps which gives the user some information about the recording is implemented using a JavaScript library jQuery⁸.

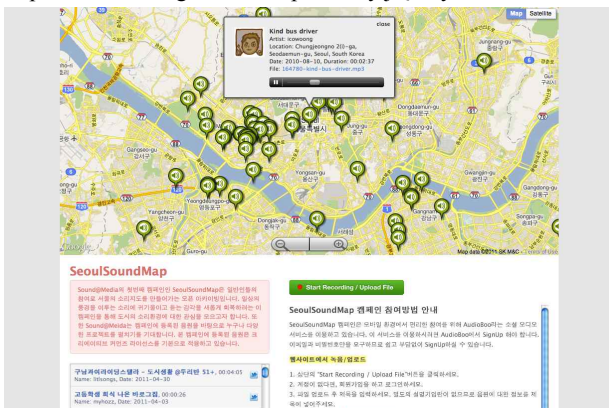


Figure 3. Screenshot of the SeoulSoundMap webpage.

2.3 SoundScape Composer

SoundScape Composer is an experiment to design a ready-to-use tool for soundscape composition. In designing the SoundScape Composer, we adopted the Schafer's categorization of soundscape into keynote sounds, signals and soundmarks with a slight modification. In this application, sounds on Google Maps represent soundmarks that refer to the community sounds reflecting the unique sonic environment of a specific place in Seoul. As one soundmark is chosen by a spectator, a keynote sound is automatically generated according

to the atmosphere of the chosen soundmark. Then users can locate sound objects, referring to Schafer's signal, from the object navigator below the composition palette, and modify each sound object's properties such as position, pitch, volume, and distance to make music.

SoundScape Composer consists of three parts, including the composition palette, the sound map, and the sound object navigator. The graphical user interface is implemented in Flash with Google Maps, and the sound synthesis engine is implemented in SuperCollider. When a user chooses a marker from Google Maps or a sound object from the navigator, an OSC (OpenSoundControl) message is passed to SuperCollider, then SuperCollider manages the corresponding sound by controlling Buffer and Synth objects. SuperCollider is also used to generate the keynote sound by means of granular synthesis.

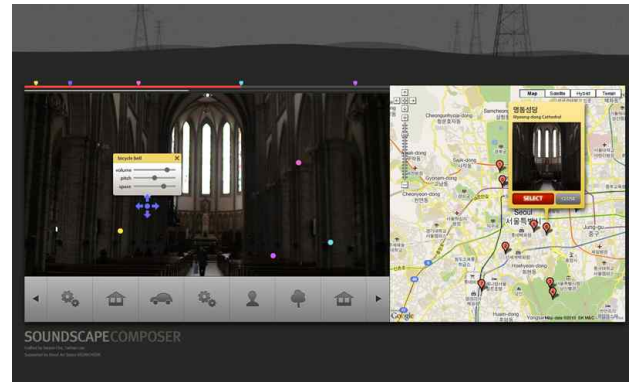


Figure 4. SoundScape Composer (installation version).

3. CONCLUSION

By leveraging the current Web technologies, various web-based sound projects are proposed as a new approach both for sound and music research and artistic expression. In this paper, we suggested a conceptual model of a Web application framework and introduced corresponding prototype projects, SeoulSoundMap and SoundScape Composer. The main goal of SWAF is to provide a robust and extensible framework for the development of Web applications and Web services in terms of soundscape composition and documentation. Future works on SWAF include the implementation of a standard software framework and the development of our own online archive and its applications.

4. ACKNOWLEDGEMENTS

SeoulSoundMap is developed for the Sound@Media project which is an initiative of Moonji Cultural Institute supported by the Seoul Foundation for Arts and Culture. SoundScape Composer is a project commissioned by Seoul Art Space Geumcheon for the exhibition <The Return of Techne>.

5. REFERENCES

- [1] Donati, L.P. and Prado, G. Artistic Environments of Telepresence on the World Wide Web. *Leonardo*, 34, 5 (Oct. 2001), 437-442.
- [2] Kac, E. Telepresence Art. http://www.ekac.org/telepresence.art_94.html.
- [3] Lane, G. Urban Tapestries: Wireless Networking, Public Authoring and Social Knowledge. *Personal and Ubiquitous Computing*, 7, 3-4 (Jul. 2003), 169-175.
- [4] Schafer, R.M. *The Soundscape: Our Sonic Environment and the Tuning of the World*. Destiny Books, Rochester, VT, 1993.
- [5] Truax, B. Genres and Techniques of Soundscape Composition as Developed at Simon Fraser University. *Organised Sound*, 7, 1 (Apr. 2002), 5-14.

⁷ <http://audioboo.fm>

⁸ <http://jquery.com>