SONODE; a collaborative sound map of Mexico City

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ABSTRACT

Sonode is a project for collecting digital recordings using mobile devices. These recordings are stored in a database that is presented in an interactive web map. Each recording is analyzed with traditional audio descriptors. The data allows researchers and students to apply machine learning algorithms to extract information about the city, the places, and also to facilitate the composition of soundscapes.

1. INTRODUCTION

The way music is created, distributed, composed and listened has significantly changed with the development of modern technologies. Among these changes, we can now generate and manipulate sound in different locations at the same time converting the compositional process into a collaborative experience. The paradigms of sound composition and ownership have been transformed by these changes.

This research seeks to combine the efforts, objectives, work, and research of the researchers whose goals are oriented to the search for new paradigms of creation and perception of music and sound art. The main question of our team seeks to respond with our work is how new technologies can help to create sound experiences where the public acquires an active participation and constant authorship. Moreover, the update on the models of composition and sound perception is accompanied by significant changes in the musical experience. One of these changes is the possibility of having distributed and propagated sound in both meanings; its actual generation, and also its metaphor through digital networks and virtual spaces sounds.

There are several initiatives for creating collective soundscapes in urban places. However, Mexico City does not have, at the moment, an interactive web-based map that could be populated with sound recordings created by its citizens. Having such platform could boost sonic research and creative experiences as well give a better understanding of the sonic behaviors of the urban city.

2. DESCRIPTION AND GOALS

Sonode is the name of the research project in the field of digital sound that seeks to integrate collective participation in the process of creation and production of soundscapes. For this, a web application and an application for mobile devices were designed. The application for mobile devices allows participants to record sound fragments that are tagged, geolocated and stored in a database and a web server. The web application allows the visualization on a map of all recorded sounds. The application generates an analysis with low-level audio descriptors that allow the automatic classification of sounds. Finally, with the generated data it is possible to produce small algorithmic soundscapes with the selected audio tags.

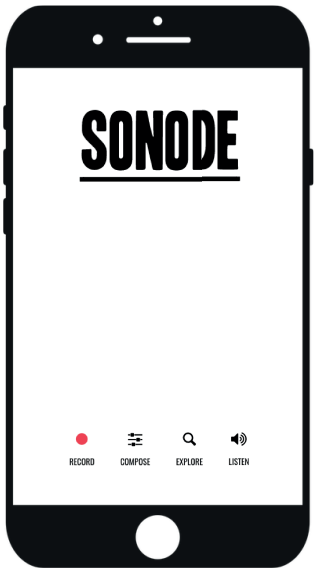

Figure 1. Sketch of the cell application.

As a whole, sonode is a system for studying the sound of Mexico City and can be used not only by the general public but also by acousticians, composers and urban planners who wish to use sound sources of the city in their work. You can find the live project at `https://www.sonode.org/`

3. TECHNOLOGY

Technically, the application for mobile devices was created with the Unity system which allowed the development of the Android and iOS platforms simultaneously. The web application was developed in Meteor which allowed a fast production using javascript as part of the server. The database is hosted on a server on Amazon AWS and the production of soundscapes is obtained using a Lambda function on an AWS Tomcat virtual machine using the JSyn audio library for Pure Java.

The system includes an API that allows researches to

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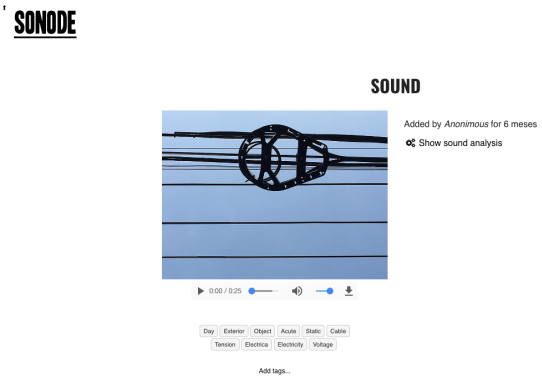

Figure 2. Snapshot of the web map.

Figure 3. Snapshot of the web map.

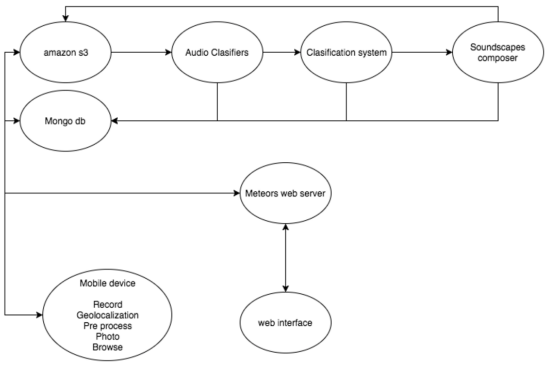

Figure 4. Diagram of technical organization.

Figure 5. Mobile speakers of sound installation.

generate custom processes and mechanics to interact with the data contained at the database. The API is located at `https://www.sonode.org/api`

4. APPLICATIONS AND AUDIO GENERATIONS

As mentioned before, the web system allows the automatic generation of short soundscapes based on selected tags. It is possible to listen to a generated audio at `https://goo.gl/tvQFZJ`. The collected audio -using the API- has also been used in the sound production of an interactive sound installation where a set of mobile megaphones point to the geographic place where the sound was originally recorded producing a kinetic soundscape. The sound is generated based on the geographic metadata.

5. CONCLUSIONS

Sonode is a work-in-progress interactive tool that could be employed for music composers and the general public to review and explore the sounds of Mexico City. This project helps creative people to organize and generate soundscapes algorithmically. The project will continue its development and the team will boost the participation of the public in order to get a significant amount of sounds.

Acknowledgments

Sonode is a project in development that arose initially thanks to a collaboration between the author's research group and the Opera of the Future group of the Media Laboratory at MIT as part of a MISTI grant. This project is supported by several initiatives: The research *Sistema de clasificación y análisis del entorno urbano a partir de mapas sonoros colectivos desde un pensamiento creativo* supported by *Programa para el Desarrollo Profesional Docente, para el Tipo Superior (PRODEP)*; the research *Entorno, datos, señales e información: aproximaciones y procesos creativos en el campo de los nuevos medios* as part of the research group *Práctica como investigación en las artes, transdisciplina y sonido [PiaTS]*.

The author wants to thanks Romain Re and Luz María Sánchez for their help in the development of the work.