Porto Sonoro – Documenting and transforming the sonic background

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ABSTRACT

This paper presents and describes an approach and a methodology for the construction of an open framework and a digital database dedicated to collect, organize and transform the urban sounds of the city of Porto.

The project aims at reflecting the sonic identity of the city by means of articulating documental, analytical and social purposes with the artistic transformations of the sound contents.

1. INTRODUCTION

The term soundscape was introduced by R. Murray Schafer and has been under scrutiny over the last 30 years. The concept has been developing naturally since its initial studies that focused on the relationships between sounds, environments and cultures, generating an outcome that drives multiple sound related fields [1].

For the purpose of our work we would like to briefly expose two main approaches under one big concern that deals with real sound environments:

a) The traditional classification proposes sound as a socio-cultural function that can be divided into: keynote sounds, signal sounds and sound marks [2], which allows the elaboration of a taxonomy and a contextual relationship between sounds and environments commonly labeled as acoustic ecology, first within the frame of the World Soundscape Project in the 70s and more recently through the World Forum for Acoustic Ecology in the 90s [3].

b) The concept of sound object introduced by P. Shaeffer [4] conceptualizes sound as an entity of its own and independent from its source. Inspired by the progress of recording technology that allowed sound reproduction without the presence of its cause, Shaeffer developed this approach and consequently a deeper study of the specificities of the individuality of each sounds in a way not possible until then.

This interesting division posed by Francisco López as "...antagonistic conceptions of the same fact"[3] is concerned with the concepts of *Schizophonia* and *Sound Object*. The former denies the possibility of using sounds outside their ecological context as opposed to the latter.

Our project proposes another framework that does not claim to overcome this confrontation but to combine the two perspectives through an online platform where a dedicated and dynamic sound collection can be the basis for a dialectic and optative approach for the sound enthusiasts in order for them to retribute in the form of a documentary/cause-effect/analytical approach or an expressive/abstract one.

1.1 City of Porto

Porto is the second-largest city in Portugal, and one of the major urban areas in Southern Europe and the capital of the second major great urban area in Portugal.
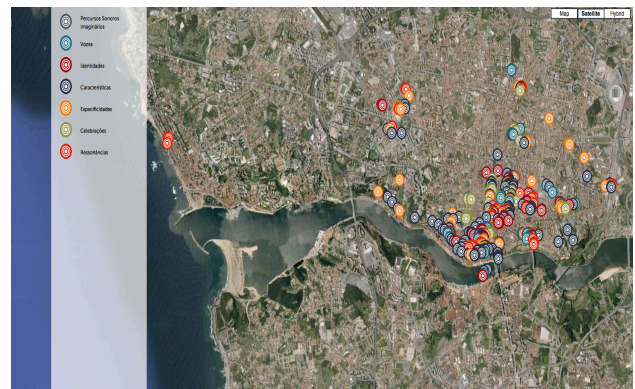

Figure 1. Sound cartography of the city of Porto.

Its administrative limits (an area of 41.66 km²/16 sq.mi) include a population of 237,584 (2011) inhabitants distributed within 15 civil parishes. The

urban area of Porto, which extends beyond the administrative limits of the city, has a population of 1.3 million (2011) in an area of $389\,km^2$ (150 sq mi), making it the second-largest urban area in Portugal. The Porto Metropolitan Area includes an estimated 2 million people.

Located along the Douro river estuary in northern Portugal, Porto is one of the oldest European centres, and registered as a World Heritage Site by UNESCO in 1996. Its settlement dates back many centuries, when it was an outpost of the Roman Empire [5].

1.2 Manobras no Porto

Manobras no Porto was a project integrated in the Porto 2.0 mechanism aiming at revitalizing Porto´s Historical Center through the action of a multidisciplinary team and knowledge areas that spawned from a background covering artistic fields up to social sciences. It was born as a challenge for Porto to meet and experience its historic center.

For two years (2011 and 2012) the goal was to convene movement, life and action, to appeal to people and ideas, to create a here and now involving the faces and bodies of the city, to produce and demonstrate knowledge and feeling, to build future in the city [6]. The project stemmed from the belief that the inhabitants and visitors to the Historical Centre are themselves social, cultural and creative agents – and could thus lead the discovery and the rooting of new models for living, regenerating and connecting with the City's multiple quotidians.

Placed within the presupposition of the most diverse studies that point towards the creative dimension as an asset towards urban development, soon Manobras no Porto unraveled and transcended a strictly economical reading of this. Development is, simultaneously, a process woven onto narrative, anthropological, geographical and emotional fields [6].

1.3 Porto Sonoro

Porto Sonoro appeared in this context within a broader project named Sons do Porto.

This project establishes Porto and the sonic identity of its historical center sonic identity as a starting point for reflection by means of its research, documentation and artistic re-interpretation.

Under this light, Porto Sonoro emerges to offer a view and a process in order to serve the questions and concerns raised above through a sonic interpretation, using tools such as recording, editing and processing.

Through this continuous work of selective compilation of the city's sonic patrimony we hope that we can contribute for the understanding and study of its sonic identity, its transformations due to changes in the urban characteristics and, if possible, a cultural definition through sound. This can mean a correlation between specific sonic environments and phenomenon with socio-cultural characteristics and actors.

- Theoretical objectives

To understand sound as an asset of modern day life in its most spontaneous form, this sound research aims at exposing its potential by rethinking the city and its sound basis. By recollecting and reorganizing its fragments we believe that spaces can be reconceptualized. Sound paradigms can overcome and integrate different academic fields and the community in general, using diverse sound tools to describe soundscapes or to create new ones.

A creative approach is also incentivized. The sound sources of a certain place may serve as a dynamical motive for transformations, instead of acting as a static phenomenon or be reduced to mere noise pollution problematics [7].

- Practical Objectives

To create an online platform, open to all to access and contribute. The content of this platform can be used by the scientific community for research and analysis and by the artistic community to use in a sound design context, visual integration or music composition.

With this expanding platform we aim at preserving and increasing the city of Porto´s sonic patrimony, which contributes to the general population collective memories and imaginary through its actors and ambiences.

2. METHODOLOGIES

2.1 Exploratory visits to Porto´s historic center

The first meetings and discussions about Porto Sonoro took place in July 2010, where the main focus of the project was determined and how it was going to fulfill the expectations of the Manobras no Porto festival. Since the main area of intervention was the historic center of Porto, several visits were made to numerous spots in this area to make a first attempt to discover characteristic places where the sound

identity of the city could be expressed in various forms. These first exploratory visits were also important to define the recording strategies for each type of sound source. This topic will be discussed with further detail in section 2.2.

In the first phase of this project it was also defined the basic profile of the team involved in the recording, editing and transformation of the sounds. This profile consisted of creative sound artists with experience with computer technologies, ranging from electroacoustic composers, sound designers, musicians and creative sound technicians. This specific range guaranteed a group of people deeply trained in active listening that would produce, in theory, better artistic results and guarantee a high standard in audio recording quality. By the end of 2010, the following methodology was established:
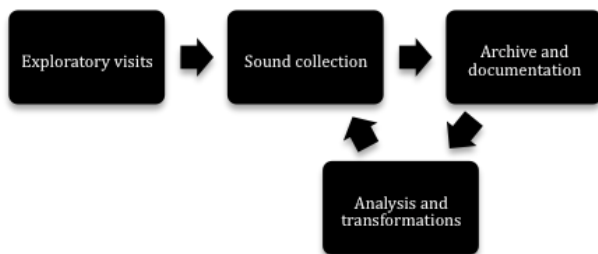

Figure 2. Methodology diagram.

2.2 Technical considerations

As mentioned previously, the exploratory visits allowed us to define different recording strategies for each type of sound source. Outdoor audio recording is usually done with portable equipment that consists basically on a recorder, microphones and a perche. Although the size of this equipment can vary in portability, it's easily visible and recognizable as a professional audio recording set. This option proved to be perfectly suitable for sound sources such as general soundscapes (traffic noises, room acoustics, natural fauna) or isolated and detailed sounds (traffic lights, fountain, church bells), since the recording quality could be ideal in terms of sound equipment and microphone placement.

However, such equipment proved to be a negative interference in the cases where human activities and human speech were involved. One of our main goals was to document the city's sonic identity in its most spontaneous state, which included daily stories and natural accent. Audio recording apparatus such as a perche automatically produced an effect of intimidation, affecting spontaneity as soon as it was visible.

To guarantee spontaneity in speech, from natural accent to genuine daily life stories, we opted for binaural microphones placed in our ears directly connected to pocket sized professional recording devices. Binaural microphones have the appearance of normal headphones, which guaranteed us to do professional recordings anonymously, without any interference in the local environment. This recording technique proved to more effective as we simply looked like we were merely listening to music on regular headphones. Also, binaural recordings offer a great sound quality that documents the audio soundscape in a very realistic way, especially when played back on headphones.

However, this recording approach revealed two main problems. The first one, technical, was related with the placement of the microphones. Since we were recording anonymously, we could not position ourselves in the ideal recording spot. The second, ethical, was related with the unauthorized recordings we were doing. We used the criteria of recording only on public locations (cafes, streets). Additionally, individual stories that could compromise in any way any person were immediately erased. In the cases were a specific personal insight was demanded or presented in public (such as a political speech, a specific story, a street musician), the name of the intervenients is credited.

2.3 Archive and documentation

Sound events were archived with the information about each recording, including recording equipment, microphones, date, hour, place and specific notes that would allow further analysis (if it was recording during a national holiday, in a rainy day, if a man was drunk when he was talking).

Editing was limited to trimming audio files, removing wind or unwanted noises, and equalization and compression was used only in extreme cases where audio was not recorded in the ideal conditions. This allows further audio reinterpretations and keeps trace of the original recordings.

Selection of sound events in an audio file was done in order to focus on specific aspects, like a church door slamming in the middle of a mass. All these selections were done and archived with the proper relation to the original sound file, to avoid incorrect displacement of sounds from its original sound source.

Sound events were then organized on seven different categories. Although many efforts have been made since the dawn of electroacoustic music to organize sounds according to universal criteria [2, 8, 9], a personalized taxonomy was used. The main

reasons were the ease of use and archive search to a wider range of specialized and non specialized users and avoid strict categorizations, that in the case of electroacoustic music would involve either a highly sophisticated taxonomy or a simpler, ambiguous one.

The seven categories are *Vozes* (voices), *Identidades* (identities), *Características* (characteristics), *Especificidades* (specificities), *Celebrações* (celebrations), *Ressonâncias* (resonances) and *Percursos Sonoros Imaginários* (imaginary sound walks). A brief description of all the categories can be seen below on table nº 1.

Among these seven categories, only the last one involves the artistic transformation or artistic interference on the original soundscape of the city. Details on this category will be discussed further on this paper.

Category	Description	Examples
Vozes	Short speech examples focusing on accent and local expressions	Funny expressions; Exaggerated accent.
Identidades	Contextual local stories	Daily stories; peculiar stories.
Características	General soundscapes	Traffic noise; streets soundscape.
Especificidades	Specific sound marks	Fountain; church bells.
Celebrações	Social events	Mass; football game.
Ressonâncias	Particular acoustic characteristics	Church acoustics; tunnels.
Percursos sonoros imaginários	Artistic reinterpestations	Electroacoustic compositions; sound design.

3. RESULTS

3.1 Online platform

A significant part of the audio recordings done for this project can be accessed on the Porto Sonoro website (www.portosonoro.pt). The website is organized around two basic principles, the documentation and transformation of the sonic identity of the city. In this first phase, it was focused mainly on the city's historical area, but further developments will broaden the activities to the whole city.

Regarding documentation, sound events were organized according to the categories described in section 2.3. There are two forms of accessing the sound events. In both forms, sounds can be freely downloadable. The first one, on the *Cartografia Sonora* (sound cartography), sounds are displayed on a city map, allowing the user to search for sounds in specific parts of the city. Each sound event is displayed with a color symbol according to its category, and can be played back simply by clicking the icon. Searching sounds in *Cartografia Sonora* is particularly useful when a user is looking for sounds of particular places (e.g. the bells of a church, a fountain, the acoustics of a tunnel) and for comparing the different soundscapes of the different parts of the city.

However, considering a vast amount of sound events displayed here (more than 500), a problem of search redundancy emerged: the user can be easily drawn into sound events that were not directly related to his original search.

To avoid an exhausting search into hundreds of sounds, a second form of accessing the sound events was created, and called *Recolhas Sonoras* (field recordings). Here the sounds are also organized according to the same sound categories, but displayed on a list. Apart from the display, the main difference is that only representative sounds of each category were selected for these lists. Sound navigation is simpler in this mode, and it´s easier to find the most relevant sound events recorded for each sound category.

Sonic transformations can be accessed on the *Transformações Sonoras* (sound transformations) section. Here, users can hear the artistic transformation of the city sounds on the subsection *Percursos Sonoros Imaginários*. The transformations range from audio processing of sound events, electroacoustic compositions based on the city's sonic identity or site-specific sonic interventions. The transformations are organized according to its author.

Sonic transformations can also be done with two applications freely available in the *Transformações Sonoras* section. Manobrador is a simple Max/MSP application developed by George Sioros and Gustavo Costa to combine and transform sound events. It's an application designed for users with little experience in audio processing. It allows the combination of several sound events in a mixer (controlling volumes and panning), pitch transposition, time stretch and reverberation control. Users can also record their sonic transformations with this application, and upload the results to the website. The sec-

ond available application, Portophone, was developed by Filipe Lopes for the educational service of Casa da Música in Porto. In this application, users drag and combine their recorded sounds into a city map.

3.2 Presentations at Manobras no Porto

Manobras no Porto involved nearly 7000 people. During its two-year spawn, 777 presentations were made in the areas of sound, performance, visual arts, design, gastronomy, agriculture and commerce [6]. A significant part of these presentations, in which Porto Sonoro can be included, was transdisciplinary and developed as part of a collective reflection of the past, present and future of the historic center of Porto.

Porto Sonoro acted as the basis of several musical projects, as well as a source of information for projects of other areas. A team of 15 of musicians / sound artists was placed in the field and collected material that was then organized as more than 500 sound events. The archive was then shared with a group of composers and musicians that were invited to create an artistic reflection of the sound identity of the city. During the two-year festival, seven electroacoustic compositions were commissioned, four sound installations and 14 concerts ranging from jazz, improvised music, pop and folk were presented.

Two workshops (popular rhythms of Porto and construction of new musical instruments) were also presented each year, involving the local communities and their relation with the sound environment.

A general discussion about Porto Sonoro was conducted in 2011, and two others in 2012. On the latter, two different types of presentation were used, but in both cases several blindfolds were also given to the public to enhance the aural capacity, a technique commonly used by composer Francisco Lopéz [3]. In the first presentation of 2012, included as part of the program of OuUnPo(RTO)[1], a commissioned electroacoustic piece was presented indoors, in combination with acoustic sounds played in several points of the room [11]. On the second presentation, four commissioned electroacoustic pieces were presented outdoors, in combination with the environmental sounds of the city's historical center.

Another uses of the Porto Sonoro´s archive include the puppet theater play *Sombras na rua de Trás*, where recorded speech acted as the basis for the

script, a sociological study currently being conducted by Paula Guerra[2] and a music track in a pop record by local artist Stereoboy.

3.3 Rádio Manobras

Rádio Manobras is an open community radio that seeks dialogue with the people that inhabit, work and define the identity of the city of Porto and, in particular, of its historical center [12]. It was created for the Manobras no Porto festival, and is still currently active.

Porto Sonoro´s sound archive has been transmitted frequently by Rádio Manobras. Although the grid is subjected to common changes, a regular daily program (entitled Porto Sonoro) is transmitted. The program consists of the sound archive and electroacoustic compositions based on the sounds of the city.

During the 2012 Manobras no Porto festival, ten one hour special programs were developed to be in constant airplay on Porto's underground subway stations. The purpose of these programs was to confront a large number of people with the sonic characteristics of the city. Due to the lack of visual information on Porto's underground stations (publicity is usually not allowed), these programs served both as a vehicle for promotion for the festival and as a reflection on the identity of the city. The content of these programs can be accessed on Radio Manobras website (www.radiomanobras.pt).

4. CONCLUSIONS AND FUTURE WORK

The introductory part of this document made reference to the potential of sound events that a space generates. They can function both as referential to its sonic ambience and identity, and also as a creative tool.

Along with the cultural events that derived from this project and were described in the results section, we could also infer some preliminary conclusions, which we believe that can be brought to light even further by a continued methodic and systematic approach through sound studies.

Each city combines multiple elements and dynamics that make possible its sonic identity such as its natural elements and geographic localization, since they create peculiar and unique aural atmospheres and acoustic spaces. In the case of Porto´s historical cen-

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[1] OuUnPo(RTO): *ouvroir d´univers potentiels* is a research network made up of artists, curators and researchers who together look at the boundaries of performance by appropriating and stretching the language of workshops, seminars and meetings. [10]

[2] *Sou do Porto e trago um Porto em mim* is a sociological study from the University of Porto's Sociology Institute. A profile of its inhabitants is being studied through audio recorded narratives of daily life experiences.

ter the predominance of granite and its delimitation by the river and the sea are notable factors.

Sociological and historical factors along with functional and economical policies, also seem to have a result in the urban organization and architecture influencing how people interact and talk [13]. An example of this is the open way people communicate from window to window since the streets are very narrow in this area. This behavior creates idiosyncratic reverberation effects and an overall increase of the loudness of the voices along with local speech codes and references.

In what concerns methodological aspects, we are aware of the subjectivity that is implicit in a project like this in general and during the labeling and classification process in particular. We hope that the approach chosen will contribute to the theoretical discussion over this subject.

Methodologically speaking, the handling of data could become overwhelming in terms of a natural tendency to record large amounts of information. Hence the importance of filtering and becoming aware of the information that could be redundant or unnecessary for the project.

Future plans focus on the elaboration of a more complex and extended network meant to cover other areas of the city. This could allow us to establish comparative models and optimize our methodology in terms of systematization.

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