

# POLISphone: Creating and performing with a flexible soundmap

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## ABSTRACT

POLISphone is a software for music performance, inspired on the popular idea of “soundmap”. Unlike most soundmaps, its main aim is to provide a way to easily create original soundmaps and perform with it. It also targets to be a versatile interface, both visual and sound wise, and to induce a sense of instrumentality. In this paper, the authors describe its implementation and, in addition, considerations are made regarding its use and performativity potential, based on fieldwork.

## 1. INTRODUCTION

Over the past few decades, an increasing awareness of soundscape’s importance in human life has been taking place. Soundscape is currently recognized as an important factor in public health and well being, a critical element of identity and heritage, defining a time, a place, a culture, among others. The soundscape became a field of study and research for different scientific disciplines, a matter for artistic creation and a subject taught in many educational courses, from primary school to the post graduation level. Murray Schafer and his group, the founders of the World Soundscape Project (WSP) [1] in the late 60’s, were the leading persons in revealing the significance of soundscapes while also sparking the interest in recording them and use them to create music.

The project *Five Village Soundscapes* [2], from 1975, is one of many example about the impetus of recording, preserving and analyzing soundscapes from specific places. Recently, in 2009, those places were re-visited following a study called *Acoustic Environments in Change*.

Although most of the work of Murray Schafer emphasizes the ecological importance of the soundscape, the artistic domain of music composition was the perspective from which it has been derived. His work, mainly his book *The Tuning of the World* [3], has inspired many artists and educators and nowadays it is not uncommon to witness the use of recorded sounds from soundscapes in the context of musical performances or installation work. Some notable contemporary composers using soundscapes in their work include: Barry Truax, Trevor

Wishart, Francisco Lopez, Justin Bennet, among others. Yet, the concept of soundscape composition is not completely straightforward. While the composers from the WSP had quite clear ideas about using such sounds in their compositions [4], the concept of soundscape composition can be challenged and even broaden [5] though it remains consensual the idea that using soundscapes in music performances seems to potentiate expressivity, create musical discourses and also establish cultural relationships with the ones involved in the composition and performance.

Schafer, besides his work as a composer and investigator, is also a professor that encouraged the teaching about the importance of soundscapes, especially for children and young people. He created the *Ear Cleaning Exercises* [3], a series of activities designed to “open” the ears and listen what is around us. His work as a pedagogue is much broader than this, it raises a range of philosophical, ethical and artistic questions but the fact that sounds of everyday life are now part of the music curriculum in public schools is certainly one of his legacies.

Soundmaps represent a contemporary manifestation of the effort in promoting the awareness of the soundscape, thus a legacy of the work initiated by WSP. They have been flourishing all over the world [6], boosted by increasingly accessibility to technologies (e.g., smartphones) but mostly through the Internet. It is no surprise that soundmaps, in recent years, have received much attention from artists and sparked interest in several scientific communities. While most of the soundmaps (New York, UK, Montréal...for instance) seem to be focus on using audio recordings as an historical landmark [6], the concept of soundmap can be dismantled into something more abstract, more pedagogical and still retain the motivation of promoting the importance of listening, especially listening to the places we live in. *Porto Sonoro* [7], for instance, continues the trend of most soundmaps but includes musical compositions and transformations based on the collected sounds.

POLISphone emerged from this context and aims to encourage the listening of soundscapes, the design of original maps, the recording of soundscapes and performing music with them. While aimed and used, so far, with children, we think that it is a tool that can engage people regardless of their age. It allows inclusive, creative, personalized approaches to an interesting subject that has the potential to be approached in many different ways.

## 2. POLISPHONE

POLISphone is the actual version of an earlier idea, the PORTOPhone, a software originally developed within the scope of the project Digitópia [8], at Casa da Música, Oporto. Digitópia, a Platform for the Development of Communities in Creating Digital Music is an emblematic project of Casa da Música's Education Service, aiming at: developing music and creativity amongst a range of ages and social conditions, and mostly amongst youth; fostering the development of free music software; promoting social inclusion, and lead to the emergence of multicultural communities of music makers/lovers; promoting free musical content [9]. A wide range of activities happens in a facility implemented in Casa da Música's main entrance hall and a team of young musicians, educators and digital artists is encouraged to develop original software aiming at 1) create personalized solutions for workshops, concerts or other events 2) create software that is easy to use, musically expressive, free and open source 3) develop music software to be used in schools. Other software developed within this context includes Narrativas Sonoras and Políssonos [10, 11].

Within the scope of Digitópia, a workshop entitled "Compor com Sons do Quotidano" (Composing with Daily Sounds) was created [12] featuring the use of several softwares (e.g: Garage Band, custom made software in MaxMSP [13], Narrativas Sonoras). The knowledge and inspiration gathered from this experience encouraged the authors to create dedicated software in which daily sounds are at the centre of the process of composition and performing.

In 2010, Sonópolis, another emblematic project of the Education Service regular program of activities at Casa da Música, provided the challenge and opportunity for using the dedicated software that was under development in a real performing situation. PORTOPhone was developed with the purpose of creating an interesting interface to perform music with sounds of the city of Oporto within the context of a concert that involved several other musical resources (described in section 3.1). PORTOPhone was based on a fixed soundmap and graphical interface that is described in detail in section 2.1.1 and after the positive reaction about using it with children, in a very challenging performing and educational context, some ideas came to mind to develop the software further. Some of those ideas included the possibility to add new map images, the possibility to define its "soundspots" and include the option to save and load soundmaps. POLISphone was developed in order to materialize those ideas.

### 2.1 Overview

POLISphone is entirely programmed in Processing [14] and is published under a Creative Commons License [15]. It is open source and available for free download, making it possible to reach virtually anyone.

POLISphone starts in a metaphorical night mode (see Figure 1). When the switch is clicked, POLISphone comes to life, opening the default map and sounds, ready to be played.

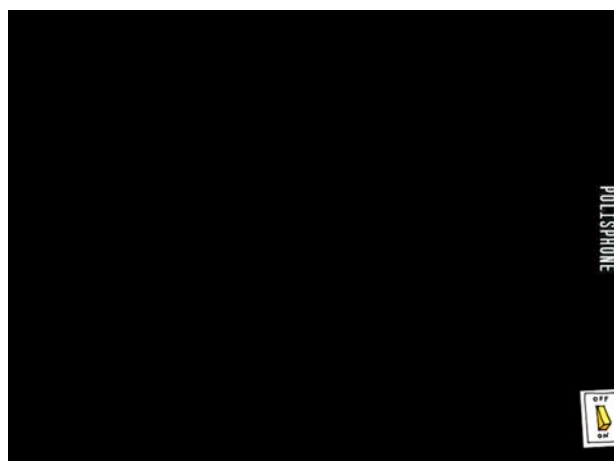


Figure 1. POLISphone opening image

POLISphone has three possible performance modes: Portophone mode, Image mode and Drawing mode.

In the Portophone mode, POLISphone will load a default map and default sounds (as used in Sonópolis, referred above), whereas the Drawing and Image mode allow the user to create customized interfaces. In the initial Portophone mode, the user can click on the *help* icon (see Figure 2) and read the help both in english and portuguese.

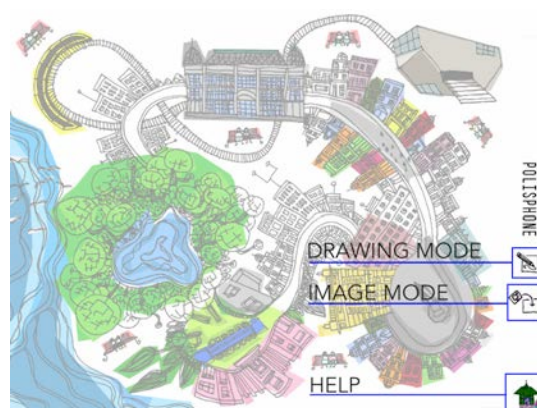


Figure 2. POLISphone icons

In any of the modes, sound is produced by moving the mouse in circles in the soundspots. Soundspots are the locations within the software that react to the mentioned mouse movement (e.g. colored areas in the Portophone mode). Upon that action, an animation of a vinyl record emerges affecting the volume of that sound. Each soundspot has its own sound and according to the size of the vinyl, the sound will play louder or softer.

Faster mouse movements make the vinyl become larger and the sound louder. If the mouse leaves a soundspot, the vinyl will slowly decrease its size until it disappears. The sound will, consequently, fade out. After a sound is started, clicking the mouse in a soundspot will, however, "freeze" the vinyl in its current size, thus the current sound volume. This means that the sound will continue to be played in loop even if the mouse leaves the soundspot.

To “unfreeze” the vinyl, the soundspot needs to be clicked again.

In practical terms these simple features enable to play individual sounds (always starting with a fade in and ending with a fade out) as well as mixing different sounds while controlling the volume of each sound. This means the possibility of creating complex, dynamic textures that can be manipulated and evolve in real time. This feature allows a range of expressive possibilities somewhere between real time composing and instrumental performance.

In any of the modes, it is possible to replace the current sounds by new ones. In order to do that, one just needs to drag and drop audio files in the soundspots.

The software allows the user to save and load any POLISphone. By pressing ‘s’, the user can save his POLISphone and, likewise, by pressing ‘l’ the user can load any POLISphone. When saving, after the user chooses a folder to save the data, an image file of the map (MyPolis.jpg), copies of the used sounds and an xml file (polisPHONE.xml) will be created. In the xml file, the information regarding the map image file will be stored along with the soundspots location and the relative paths of the used sounds. To load a POLISphone, the user needs to choose the desired *polisPHONE.xml* file.

The possibility to save and load is quite important because it allows anyone to re-visit soundmaps or/and continue to work on them.

### 2.1.1 Portophone mode

Portophone is the initial and default mode. Its interface, a drawing that represents iconic places of Porto (see Figure 3), is a drawing by artist Maria Mónica, who collaborated with the authors. The default sounds are recordings from the real places recorded for Digitópia’s freesound database [16].

Unlike any other mode, Portophone mode has spots that are triggered simply by hovering with the mouse. These spots are iconic representations of park benches and these “sound benches” contain testimonies of elderly people talking about Porto and their homes.

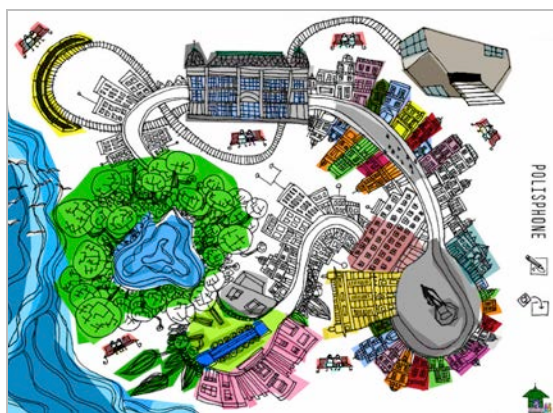


Figure 3. POLISphone opening image

### 2.1.2 Image mode

Dragging and dropping an image file to the image icon (see Figure 2) initializes Image mode, thus creating a new

POLISphone. It will replace the current image map by the new one and reset all the soundspots. When a reset happens, eight numbered circles are created in the upper right corner representing the soundspots (see Figure 4). The user can then drag the circles to the desired places, making them a soundspot. By default, the sounds played are the ones that come with the original Portophone or those that replaced any of them. The user can, however, at any time, drag and drop new audio files and replace the current ones.



Figure 4. POLISphone reset

### 2.1.3 Drawing mode

Clicking the drawing icon initializes the Drawing mode (see Figure 2). The screen goes white and the soundspots are reset. Just like in the Image mode, when a reset happens, eight circles are created in the upper right corner representing the soundspots.

Drawing possibilities are very limited. When the user presses the mouse he can only paint in green but if the mouse is moved fast, the stroke will increase (see Figure 5).

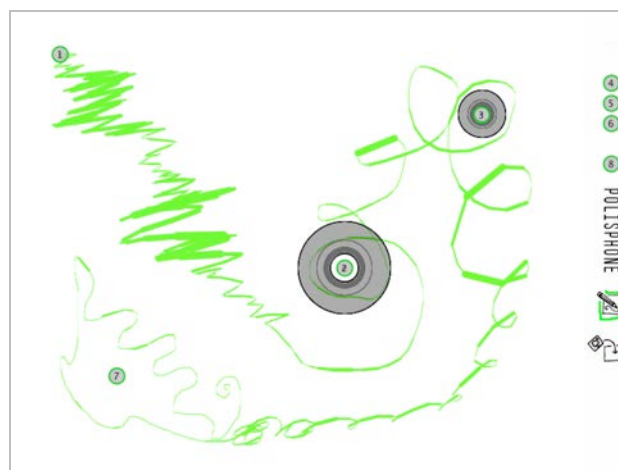


Figure 5. Drawing mode example

## 3. POLISPHONE IN ACTION

POLISphone was developed as a tool for sound performance with daily sounds. Besides the expressive possibil-



ities referred in the overview, the save and load feature and the fact that is easy to reconfigure, even during a performance, were considerations that oriented its design. This section reports two practical experiences and proposes a model towards future projects.

### 3.1 POLISphone in Sonópolis and Jardim Interior

Two major performing projects were done with PORTOPhone/POLISphone up to now: the Sonópolis performance in 2010 and more recently, in 2013, Jardim Interior.

Sonópolis has been, since 2007, an important landmark in the regular activity of Casa da Música's Education Service. Sonópolis is simultaneously a community project that involves different groups that work with the Education Service for several months and the last of a series of real practical experiences that are part of a training course for musicians that want to learn how to work within the community. Every year a new Sonópolis is configured, giving the opportunity for different communities to make their "voices heard". Over the years some of these communities have included already existing musical projects that needed a boost or projects that the Education Service started. Choirs with unemployed people or imprisoned man have performed along with batucada groups, alternative percussions, beat-box ensembles, orchestras of electric guitars or tuba ensembles, to mention a few. The training course usually involves about 15 skilled musicians playing a variety of musical instruments, and this changes every year, too. Sonópolis emerges as the culmination of a year's work that starts with different separate ideas happening in different places over the city or adjacent villages, gradually merging into a big performance that is rehearsed and presented at Casa da Música under the artistic direction of well-known community musicians (people such as Tim Steiner, Paul Griffiths, Sam Mason, Pete Letanka have been involved in Sonópolis). The idea of Sonópolis as an imaginary City of Sounds was partially inspired by Italo Calvino's *Invisible Cities* and by the idea of celebrating the diversity of music and its potential in bringing together people from different social and cultural backgrounds [17].

Crossing the soundscape with musical discourses emerging from different community projects was envisaged since the early days but it was only in 2010 that this became feasible with PORTOPhone. Sonópolis 2010 was directed by Carlos Malta and included a choir with homeless people, a children's choir from a deprived council estate, a traditional Portuguese percussion ensemble and an instrumental ensemble with the musicians that were part of the training course as referred above. One child from the 4<sup>th</sup> grade was given the task of playing the PORTOPhone with the assistance of one of the authors. The concert was a memorable experience and the PORTOPhone proved to be a resource of immense potential, "painting" the musical discourses emerging from the different vocal and instrumental groups with sounds that added a very strong sense of the City of Sounds.

The experience with *Jardim Interior* was very different in many aspects. The context in which occurred is the Opus Tutti project [18], a research and intervention pro-

ject aiming at the development of artistic tools that promote integral human development since early childhood. A strong emphasis is put in the work with babies and very young children, with many actions being developed in a pilot nursery school, but the intervention is regarded as systemic and therefore it involves also the families, educators and a group of artists (musicians, dancers and actors interested in the idea of art as a tool for human development).

Jardim Interior is the third piece of a series of participatory events that mingle music, theatre and movement. In the first, *Um Plácido Domingo*, the magnificent gardens of the Gulbenkian Foundation in Lisbon were approached as the sound and visual environment that hosted what was described as a "garden opera", a "happyning" or performative dialogue aiming at the tuning of people, birds and flowers. The piece involved about 70 participants, from 6 to 70 years old, and several sound, movement and visual elements structured as events in interaction with particular aspects of the ecology of the place. After the second piece, *Babelim*, the idea emerged of composing a more intimate piece that would be performed for an audience of babies and their parents sitting in a circle, surrounded by older children and adults that would combine vocal and instrumental resources, including conventional and unusual musical instruments, among which a piano that would also be used as the resonator for electronic sounds being produced by contact loudspeakers.

Jardim Interior can be translated as Inner Garden and it was inspired by *Sakuteiki* the oldest published Japanese text about the art of making gardens, probably written by Tachibana Toshitsuna around one thousand years ago. The book defines the art of gardening as an aesthetic endeavor based on poetic feeling of the designer and the site, and, being written in a time during which the placing of stones was the most important part of gardening, advises the reader not only how to place the stones but also how to follow the "desire" of the stones. Jardim Interior is a metaphor for the need to listen attentively to the "stones" that are within our reach (people, sounds, images or movements) and available to become part of the "garden", an attempt to organize the possibilities for poetic dialogues between what there is and one imagines, of modulating "multiscapes" (interior and exterior, sound and visual, emotional and physical). A strong sense of "taking care of" is also implicit in the idea of a garden and this is particularly important for the philosophy of the project, with many artistic activities being developed to nurture this aspect of human companionship. Jardim Interior emerged after a series of creative workshops with children, among which one entitled *Composing With the Soundscape*. Over four mornings a group of five children aged 11-15 became acquainted with the notion of soundscape, recorded and catalogued sounds in the Gulbenkian gardens, produced original soundmaps using the Image mode of POLISphone and participated in composing/improvising activities where these sounds would be integrated along with electronics and acoustic instruments.

The final performance of Jardim Interior involved about 50 people (children and adults) and the piece is a succes-

sion of sound and movement tableaux frequently connected by the sounds produced in several POLISphones developed by the children. Here, too, the soundscape was a major element of the performances flavor, with the particularity of the sounds emerging from the piano, as the electronics and POLISphones were amplified by contact loudspeakers that would make the piano soundboard vibrate.

### 3.2 Towards different models of action

Based on these two experiences, the authors have imagined a “*POLISphonic intervention*” in which POLISphone is the musical performance element in a context where the soundscape is a crosscutting element. The imagined plan is mostly directed for children and music teachers. Any audience new to this subject will, nevertheless, benefit from it, becoming more aware of the importance of sound in our daily life. Above all, because POLISphone has an intuitive interface and because it deals with sounds that don’t have the immediate connotation of a typical musical instrument, it easily engages people in the act of creating with sound and listening to music as the result of sound per se.

The proposed stages are described in the following text.

#### 3.2.1 Soundscape? Say it again?

A first stage of a POLISphonic intervention will include discussions about what is a soundscape, its effects upon us, whether it is musical, the sounds of my city, the sounds of my home, etc. Its focus is to spur an awareness of the ocean of sounds we live in while engaging people in thinking critically about the importance of sound.

#### 3.2.2 Fieldwork

The fieldwork is inspired in the Ear Cleaning exercises of M. Schafer [4] and the methodologies used in workshops by artists such as Justin Bennet, Marc Behren and others [19]. The goal of this proposal is two fold. First, to perform silent soundwalks or actively finding sounds within the environment. Second, to record both the soundscape as “*one ensemble*” but also specific sounds, what Schafer defines as *soundmarks* [4]. Recordings can be made with common sound equipment such as digital sound recorders with standard microphones or even smartphones. Variations on this will depend on the availability of equipment.

The writing of a sound diary is encouraged, comprising factual information about the sounds as well as subjective impressions about it.

#### 3.2.3 Drawing maps

Complementing the sonic fieldwork described previously, we propose that the design of maps would be inspired by visual information collected during the process. The range of possibilities is immense and includes the use of photographs, drawings and/or combinations of both. The goals can be to produce an image that resembles the spaces that were analyzed or the construction of imaginary, ideal, abstract spaces.

During the work in Jardim Interior, the group designed a single map comprised of drawings made by everybody (see Figure 4).

#### 3.2.4 Composing and performing

The process of composing and performing is not linear, since it is dependent on the context and the people involved.

In both examples described earlier, POLISphone was part of a larger ensemble that included voices, conventional and unconventional musical instruments. In Jardim Interior, although the children using POLISphone went through the creative process stages described earlier, the composition and performance was not meant to be soloist but instead integrated in a wider ensemble. It can be the case that future POLISphonic interventions might be more concentrated, culminating in something akin to a laptop orchestra.

In any case, POLISphone wants to advocate an awareness of the soundscape and be a source of motivation for such work. Thus, composing and performing using POLISphone is, essentially, a process achieved in site according to each person input, typically mediated by a musician or composer.

## 4. CONCLUSIONS AND FUTURE WORK

We believe that POLISphone is an interesting educational and performance resource. In its essence it is just a very simple sampler and a mixing console but because it was conceived specifically for music performance with soundscape sounds, the entire experience can really be focused on this subject. It can, of course, be used with any kind of sounds or images, but we believe that composing and performing with the soundscape, particularly with children, needed a software and a pedagogical approach that can help the concept to become tangible and the options were made to emphasize the concept of working with sounds that are clearly identified as belonging to the environment.

A few technical improvements are being made to make the program more robust, especially the saving function. The drawing mode could also allow further possibilities. Other improvements can certainly be envisaged as the project is still in its infancy.

In the future, the authors want to create a simple online platform where users can upload and share their POLISphone’s. Not only would it provide a database of existing soundmaps but as well a personalized and poetic impression of a given place.

At the moment there are several projects in which POLISphone is being used by others, namely in the Multimedia Master Course at the Faculty of Engineering of Porto [20], envisaging novel approaches to it in multimedia contexts. Since it is open source, and since the theme of soundscape is of actual relevance, the authors believe that an interest in these ideas will promote more discussion and further improvements, both at the conceptual and technical level.

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