

# Missing the hubbub: Memory and identity in interactive audios

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## ABSTRACT

In this paper we describe an interactive object called *Barahúnda Boba*, that was developed through the exploration of Quito's identity (a city placed in the mountains in Latin América). The interactive object is an audio container system that reproduces environmental sounds of the city to preserve the memory of Quito. This product was built after studying the Baroque's concepts, as a period, extrapolated to the Baroque's culture. The program that plays and stores the audio is written originally in JavaScript under the p5.js's library. The object is a decorative product, handcrafted in pine wood. The components are assembled in an Arduino and they are embedded in the product. Although the object has a user interface, the product (just like the noise of the city) can not be fully controlled.

## Author Keywords

Audio Memory, Sound Map, Horror Vacui.

## CCS Concepts

• Applied computing → Sound and music computing;

## 1. INTRODUCTION

People have explored the influence of interactive audio in the environment for years, from ancient African cause-effect oral traditions [8] to contemporary sound dedicated installations of urban systems [1]. Thus, we have seen several approaches to enhance different experiences via auditory information. Likewise, supporting a wide vision of Mixed Reality [9] some researchers and artists have shown a huge potential in technology for creating *meaningful augmented spaces* [10]. In this paper, we examine the design of an interactive object able to reproduce the auditory environment of a city through the analysis of the culture, as well as, gathering data from ordinary people in the surroundings.

## 2. CONTEXT

*Barahúnda Boba* (translated as Booby Hubbub) is an interactive object which includes an integrated sound system in it. This product was designed and developed through the exploration of the Ecuadorian identity. As a result, the object stores and reproduces auditory information about the city.

## 2.1 Horror Vacui

For Marvall [3], the revision of the baroque concept as an artistic period is aligned to the integrative, the decorative and the abundant. On this criterion, Castillo emphasises the constant search for the extreme. In a complementary way, the author argues that the concept *horror vacui* (or fear of emptiness) goes beyond the excess of material or the cult of exuberance. Castillo reviews this term under a notion in which even absence can generate feelings of attraction and repulsion. Therefore, it is possible to think about the Baroque not only as a conceptual period, but also as a condition [3] or a strategy [2] to live in the contemporaneity. Echeverría maintains that the *baroque ethos* is a characteristic condition of Latin American cultures, where many graphics and material products related to the popular culture of design explore (through dynamics of confrontations and agreements) the qualities of the Baroque culture to approach the *decorazione assoluta*. Thus, extravagant, elaborate, ornamental, superficial, ceremonial, overloaded, are criteria that support the notion of *horror vacui* in the baroque as a period, as well as, in the baroque as condition, but also in the baroque as Latin American strategy [2].

## 2.2 Memory

During the exploration of the identity, we found that the memory of the city has been registered through several mechanisms. Therefore, it is feasible to talk about (i) audiovisual documents in analogue and digital formats (e.g. Casa de la Cultura Ecuatoriana's Film Library); (ii) graphic memory of Quito in enlarged images and published books (e.g. *Ojo al Aviso* a photographic book by Garcés)[7]; likewise, (iii) historical texts and approaches from literature (e.g. Metropolitan History Archive of Quito), among other resources. By way of contrast, the register of auditory material able to present the current state of the city and the change of the ambient sound over time have been underestimated.



Figure 1: Places in La Carolina Park where the audios were gathered.

Accordingly, the *Barahúnda Boba* starts an approximation of the recuperation of auditory memory through a sound map. In this project we focused the research on the surroundings of one of the most crowded places in the city, La Carolina Park (see Figure 1). Those, several types of sounds were found among which stand out:



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- Sound trucks (gas tanks sellers and scrap collectors)
- Heralds (food sellers)
- Animals (birds and dogs)
- Automotive (small vehicles, buzzers, car alarms and horns)
- Others (policemen whistles and parade drums)

For instance, the voice of scrap collectors was amplified with old loudspeakers, therefore the recording is heard with a characteristic distortion. Currently, the messages they transmit are pre-recorded and commonly shared by other scrap collectors in the surrounding areas. The recording will loop during the working day.

[Compramos Fierros viejos, cocinas viejas, tanques viejos, latas viejas, carretillas viejas...]<sup>1</sup>

The messages used by these merchants have evolved over time; years ago, due to the precariousness of technology, drivers or their co-pilots had to recite the message learned from memory. The spokesmen used megaphones to raise the volume of their messages. Likewise, decades before, the broadcast mechanisms for scrap collectors did not have any type of technological implementation neither to repeat nor to enhance the volume of their voices. Those voices are now part of the cemetery of environmental sounds that live just in the memory of the oldest. Although some of the noise may be considered illegal (e.g. sound of gas tank sellers) or grotesque, these audio devices reinforce the extravagant, elaborate, ornamental, superficial, ceremonial, and overloaded conception of the Latin American baroque in sound.

### 3. DESIGN

The *Barahúnda Boba* is a sound object that stores and reproduces sounds of the city, which enables people to interact with previously collected sounds of the city, reinforcing the concept of *horror vacui*. However, the algorithm makes decisions in a semi autonomous way. The integrated sound system plays the audio randomly, conceding merely a partial control of the user over the object, mirroring the real uncontrollable environment of the city.

#### 3.1 Aesthetic

The physical object has been built in pine wood through semi-handcrafted processes in the FADA's (Faculty of Architecture, Design, and Arts) prototyping laboratory. Like the work of Bill Gaver (i.e. Photostrroller) [6] or Mario Klingemann (i.e. Memories of Passersby I) [4] the shape of the product is inspired by vintage elements of the design culture, which may cause a romantic interpretation on the idea of memory (see Figure 2).



Figure 2: *Barahúnda Boba*'s first prototype, this version was made with pine wood.

#### 3.2 Interface

The object has two basic elements on its front face: texture for the sonorous output and a slider for modifying the behavior of the system. The texture was created through a circular repetition over the surface for showing the place of the audio amplification. Likewise, the slider is connected to the integrated audio system, this element allows the user to modify the comportment of the city by changing randomly some values in the main algorithm. The slider is a prism of a rectangular base with texture on its side faces to indicate the way in which it should be held, a clamp type. The prism is located on a lane that helps to constraint the movement the user performs. It should be noted that the user has no control over the volume, on/off status, or the frequency of the tracks. The user is only able to slightly modify the audio output mode in an ambiguous framework [5]. The sounds of cities are elements that happen spontaneously and from which the inhabitants have little or no influence, this interface system reinforces the living nature of the object, of the memory and of the city.

#### 3.3 Software

The sound system was developed in p5.js, a JavaScript library. For this project, additional audio library resources such as p5.sound were included to expand the functionality. Additionally, in the web prototype, p5.dom library was also used to display a predefined digital slider.

The program generates 10 numbers randomly every second if the number is lesser than the constant, previously defined, the system will play the preloaded audios. The sound element that is reproduced is also undetermined. For the digital prototype, (see Figure 3) the information that announces the name of the file that was executed, plus a schedule (hour: minute: second) to review the periodicity of execution of the files.

<sup>1</sup> In English (We buy old irons, old kitchens, old gas tanks, old cans, old wheelbarrows...)

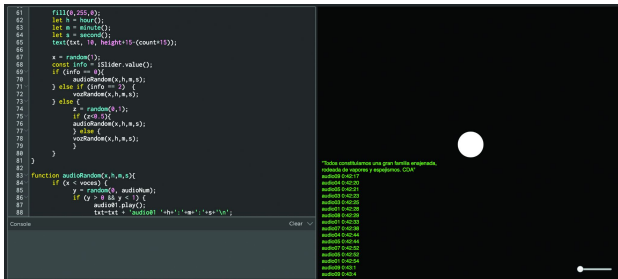


Figure 3: Source code and preview screenshot

### 3.4 Hardware

For the physical prototype, an electronic component was included to reproduce the audio. The Arduino Uno loads a wav file from the micro-SD adapter, then it generates a signal output, finally, the 8ohm speaker uses a piezoelectric effect to generate the sound. For the code TMRpcm, SD, SPI libraries were used. The same algorithm that was designed for p5.js was adapted to the board. The wooden case includes an empty space for all the electronic components.

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### 5. REFERENCES

[1] S. Adhitya and D. Scott, 2018 The London Soundmap: Integrating sonic interaction design in the urban realm. AM'18 DOI: <https://doi.org/10.1145/3243274.3243302>

[2] X. Barriga-Abril, 2019 La gráfica popular y su relación con la cultura de diseño. Foro Alfa. <https://foroalfa.org/articulos/la-grafica-popular-y-su-relacion-con-la-cultura-de-diseno> (accessed on Mar 26, 2019).

[3] D. R. Castillo, 2005. Horror (Vacui): The Baroque Condition. In N. Spadaccini and L. Martín-Estudillo (Eds).

2005 Hispanic Baroques. Vanderbilt University Press, Nashville, Chapter 5.

[4] M. Dean, 2019. Artist Mario Klingemann on Artificial Intelligence, Technology and our Future. [https://www.sothebys.com/en/articles/artist-mario-klingemann-on-artificial-intelligence-art-tech-and-our-future?fbclid=IwAR2Q0hV6n5YoNiQeaU\\_obHutezDbgjjQRsf6u9WUrJIgrsdzYDLEtdRUemM](https://www.sothebys.com/en/articles/artist-mario-klingemann-on-artificial-intelligence-art-tech-and-our-future?fbclid=IwAR2Q0hV6n5YoNiQeaU_obHutezDbgjjQRsf6u9WUrJIgrsdzYDLEtdRUemM).

[5] W. Gaver, J. Beaver and S. Benford, 2003. Ambiguity as a Resource for Design CHI'03 Proceedings of the SIGCHI Conference on Human Factors in Computing Systems. 233-240: DOI <http://dx.doi.org/10.1145/642611.642653>

[6] W. Gaver, A. Boucher, J. Bowers, M. Blythe, N. Jarvis, D. Cameron, T. Kerridge, A. Wilkie, R. Phillips and P. Wright, 2011. The photostroller: supporting diverse care home residents in engaging with the world. CHI'11 Proceedings of the SIGCHI Conference on Human Factors in Computing Systems. 1757-1766. DOI: <http://dx.doi.org/10.1145/1978942.1979198>

[7] A. L. Garces and M. Kingman (n.d.) *Ojo al Aviso*. La Cajonera. <https://issuu.com/lacajonera.ec/docs/ojoalaviso>

[8] H. Koenitz, 2015. Towards a Specific Theory of Interactive Digital Narrative. In H. Koenitz (ed) Interactive Digital Narratives. Routledge, New York, Chapter 6.

[9] P. Milgram and F. Kishino (1994). A taxonomy of mixed reality visual displays. IEICE Trans. Inform. Syst. 77, 1321–1329.

[10] M. Rieser, 2015. Artistic Explorations: Mobile, Locative and Hybrid Narratives. In H. Koenitz (ed) Interactive Digital Narratives. Routledge, New York, Chapter 16.

### APPENDIX

Digital prototype in <https://bit.ly/barahundaBoba>