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Spatial referentiality and openness: A portfolio of environmental sound compositions.

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Abstract

Through a creative portfolio and an analytical and critical commentary, this research investigates the use of spatial references in the composition of semi-open environmental sound works. The portfolio explores a number of strategies to make use of spatial references as formal compositional components to enable more intuitive performance/reading experiences. The pieces present a number of electronically mediated scenarios in varied formats; concert, installation and mobile application. Counting on the intuitive way one tries to constantly identify surrounding spaces, each piece uses physical (performance/presentation spaces) and representational devices (illustrations, maps, video projections, spatialised sound etc.) to articulate and delimitate semi-open artistic experiences. Such ambiguous scenarios are enabled by both the unpredictability of elements of each work and the dependence on the subjective interpretations of the agents involved in the process. The creative processes presented here in a descriptive, analytical and critical manner attempt to make an artistic contribution and provide documental material for future reflection about related practices.

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Contents

List of Figures

List of Tables

1 INTRODUCTION

1.1 Foreword

This text is a commentary on the portfolio of compositions developed in a practice based research context between 2011 and 2015 at the Sonic Arts Research Centre. It is a formal component meant to establish a creative dialogue between an artistic practice and a cross-disciplinary theoretical background.

Before going further, I believe it is necessary to present some information regarding my cultural background. From an early age I was interested in music, my favourite activity as a child was to listen to my parent's LP collection that included mainly assorted Brazilian, jazz and classical music. I had the opportunity to study piano, guitar and music theory from the age of 7. Since my father was a lecturer in computer sciences, technological apparatus were another influence in my life as I grew up. Much later, I was awarded a degree in Psychology from Federal University of Maranhao (Brazil). As I partially regretted not pursuing a music degree, I moved to south Brazil to enrol in the only public university (Federal University of Parana) that offered an undergrad course in music and technology. So, in 5 years, I concluded another undergrad and a master's course in which I had the opportunity to study and get involved with various music practices, such as traditional western classical composition, Brazilian regional music and electroacoustic music. My compositional practices at the time and particularly an experience in which, as teacher assistant, I was asked to devise improvisational group activities made me much more curious about the possibilities of electronic mediation and improvisation.

The present work was a consequence of some questions I proposed myself after the conclusion of my master's research. I had been interested in both acousmatic music and live electronics improvisation. During my master's research (2009-2011)

at Federal University of Parana (Brazil), my efforts were focused on the design of digital interfaces for live electronics performance. At that stage, I had developed a parallel practice of field recording to collect source material for acousmatic and live electronic works. For most pieces[1], I had chosen to make use of more discrete transient sounds, recorded in studio like environments. That preference was directly related to my interest in exploring short gestural movements in opposition to textural, prolonged ones. After concluding my master's, I became interested in semi-improvisational scenarios defined by what I vaguely start calling "meaningful constraints". A number of experiences, including a lecture by Dr Aspen Aarseth (2010) about 'game aesthetics'[2], led me to start considering 'space' as a constraint element in my practice. In my attempts to approach the matter I got closer to complex environmental sounds given their potential to carry spatial information. Besides being this potential spatiality, environmental sounds can also reveal or suggest information about social and cultural realities.

When I started working on the portfolio, already in Belfast, my approach was more abstract. I was considering space, sounds occupying space, elements, contrast and fictional guidelines to structure compositional processes. As I took part in various local projects and got to know a little more about the surroundings, I started considering to allow, in greater depth, the elements of the sonic realities themselves to dictate and set the boundaries of the works. Being at SARC, and in Northern Ireland, pushed me to engage with places in a slightly different way; less abstract, as a person that is constantly expecting to find unknown social and cultural elements. The focus on environmental sounds on the PhD portfolio allowed me to explore different spaces as both source of inspirational and structuring elements.

The portfolio is composed of six environmental sound based pieces. Behind the varied individual ideas of each work I have had one common question focusing my

[1] Such as 'Discos de Cobre' (2010) and 'Three Zin studies' (2011) (https://soundcloud.com/eduardopatricio/sets/eletroacustico).

[2] In Aarseth's view, the main aesthetic components in video games are related to the playing experience itself and the creative possibilities of action and exploration that may arise overtime within the confined spaces of a game.

efforts: *how to make use of spatial features as referential elements to organise semi-open environmental sound based compositions*? The resulting artistic outcome does not provide answers to the question, but a set of related commentaries formatted into sonic compositions.

The pieces developed during this research aim to explore spatial features to structure and organise semi-open aurally focused experiences. Such spatial elements might be physical (e.g. the space of performance, a space to which the piece makes reference) or representational (e.g. a map, a video projection, a computer user interface). The main reason to explore such elements as compositional and performance devices is to establish a perceptual frame for ambiguous pieces in an intuitive manner. This strategy takes advantage of the fact that, in everyday life, we all have to evaluate shapes, distances, proportions and relations between things around us. In doing so, we also situate ourselves wherever we go.

Since the pieces in this portfolio cannot be organised under a single widely used category of music (e.g. instrumental music, acousmatic music etc.) and each work has its particular *format*[3], this commentary needs to be somewhat extended. The extra length is necessary to clarify the general poetic approach and the format idiosyncrasies of each piece.

It is important to note that two of the works in the portfolio were developed collectively by the *Unlikely Places* ensemble, formed by Diogo Alvim, Rui Chaves and myself. As a group we certainly have common goals and approaches, but as individuals we still have specific interests and foci. Our general process of creation is based on a horizontal, active and constant collaboration in all stages. We developed the works, from initial concepts of common interest, through long

[3] The term format is used here in a broad perspective. It refers to various characteristics of a given piece, including its sound sources (e.g. specific instrumentation and/or electronic resources) and performance/presentation configurations (e.g. concert piece, installation etc.).

discussion meetings and experimental practices in group. Therefore, it is hard and imprecise to clearly delimitate and identify individual contributions to the works, which goes beyond the sum of our personal contributions.
That said, in this thesis, in order to comply with standard academic practices and requirements, during the discussion of such works, I make an effort to point out my specific artistic intentions, contributions and exploration foci, which are more relevant to my own research.

The USB flash drive that accompany this commentary includes:

- A copy of this text in PDF format, including bookmarks to facilitate navigation within the document;
- A folder containing video-documentation of the pieces. For each concert piece two videos were made (full performance video and a short presentation video); for the other works only the short video was produced.
- A folder with related performance material (scores, guidelines and Max MSP[4] patches).

1.2 Motivation

> We should (…) remember that no machine is a wizard, as we are beginning to think, and we must not expect devices to compose for us. Good music and bad music will be composed by electronic means, just as good and bad music have been composed for instruments. (Varese 2006, p. 20)

I am interested in music. I am also interested in diversity of thought and culture. Technology (recent and not so recent), besides providing solutions to practical problems, certainly causes cultural impacts that lead humans to different directions. One could try to evaluate such changes as 'good' or 'bad', but it is not my intention to pass any kind of judgement here, Manichean or otherwise.

[4] https://cycling74.com/products/max/.

Another interest of mine is the exploration of artistic ambiguity as a multiplier of possibilities. In the following passage, Eco comments on the multiplicity that arises from the interpretation of a written message:

> (…) when a text is produced not for a single addressee but for a community of readers – the author knows that he or she will be interpreted not according to his or her intentions but according to a complex strategy of interactions which also involves the readers, along with their competence in language as a social treasury (Eco 1992, p. 67).

In my perspective, sound based works, in a similar way, have a great potential to interact with the subjectivities they might reach. The ambiguity brought by works with varied degrees of openness might constitute a challenge to the way we listen in everyday life, tapping into our imagination, leading us to unexplored experiences.

The general poetics proposed in this portfolio is meant to serve the artistic outcome and not justify or explain it. While hypothesizing about the "death of art", Eco describes an elucidating anecdotal scene to question the shift of focus from the works themselves to its enabling poetics:

> The banal question of the neophyte confronting a work of abstract art ("What does it mean?"), a question that would seem to have nothing to do with aesthetics, criticism, or the history of poetics, is much more illuminating than it seems. The hapless viewer asks what the author of the painting wanted to do, because if he does not know this he won't be able to enjoy the painting. If someone explains it to him, then he may begin to appreciate the work. The work or its rationalization? (Eco 1989, p. 171)

It seems to me that, whilst a deeper knowledge about the poetics of a work can often contribute to its understanding and to the engagement with it, this portfolio intends to present pieces that seek an intuitive engagement level without previous access to the concepts behind them.

1.3 Goals

In general, as a composer I have the goal of realising works with clear guidelines, in the case of this portfolio, focused on spatial elements. This research does not intend to evaluate how the pieces resonate with the listeners. Nevertheless, there is a conscious effort to let spatial elements become apparent throughout the portfolio so they can become framing devices the listeners can identify and relate to.

The main goal of this practice-based research is to produce a number of technologically mediated sound works that use spatial references as key elements to their composition. As complementary goals I could list:

- To explore spatial referentiality as an element that helps to delimit and frame the artistic experience;
- To create sound based experiences that may lead to alternative listening perspectives, focused on elements of everyday life;
- To produce an analytical reflection regarding the artistic outcome.

Such goals are interrelated. Framing each piece with the use of spatial references is aimed at creating more engaging and intuitive semi-open experiences. The openness quality is seen as an opportunity to (a) provide new insights on everyday life dynamics; learning about our surroundings; (b) discover previously unnoticed aesthetic qualities in environmental sounds; (c) allow access to imagined 'worlds' through listening.

1.4 Methodology

The present work, as practice based research, aims to establish a reciprocal relationship between creative efforts and analytical reflection. The composition process, driven by a common question, constitutes the starting point. As each work

progresses, questions and ideas arise, contributing to the analytical discussion. The works are presented in this commentary through a revision of their original concepts, details about the compositional processes, presentation and performance. The analytical component of this commentary will address relevant topics for each piece and engage in a discussion with the aid of a multi-disciplinary theoretical background.

> When I write a theoretical text I try to reach, from a disconnected lump of experiences, a coherent conclusion and I propose this conclusion to my readers. If they do not agree with it, or if I have the impression that they have misinterpreted it, I react by challenging the reader's interpretation. When I write a novel, on the contrary, even though starting (probably) from the same lump of experiences, I realize that I am not trying to impose a conclusion: I stage a play of contradictions (Eco 1992, p. 140).

Eco's observations remind me of the duality of the artistic practice based research context, in which it is easy to get trapped in a mixed situation for often the artistic outcome is meant to "stage a play of contradictions", but it is done in a reflective and critical context that tries to articulate "coherent conclusions" possibly anticipating "contrary arguments and observations."

> A common intention held by most (if not all) researchers across the disciplines is to contribute to the advancement of practice in their area of research. In the broad area of the creative arts, works are often valued for their ability to raise questions or provide provisional and nuanced perspectives (Stapleton 2008, p.2)

From a similar perspective, the present text constitutes an effort to reflect on an artistic practice to, more than anything else, describe its poetics and raise relevant questions and observations.

1.5 Thesis outline

This thesis is composed of four chapters. Chapter 1 presents the basic ideas of the portfolio; my motivation to undertake this compositional endeavour; outlined

goals; work methodology and this brief outline. The second chapter presents a number of ideas and concepts that support and contextualise the portfolio. Related to the portfolio general poetics I address concepts such as *open work* (Eco 1989, a work that asks for completion by the rearrangement of it components or re-interpretation) and *process work* (Aira 1997, the development of novel creative strategies as focus of artistic practice), and present a brief commentary on listening perspectives and referentiality. Aiming to comment on the adopted compositional approach, I refer to concepts such as *soundscape* ('sonic environment', as presented by the discipline of *acoustic ecology*); *soundwalking* (practice that combines walking and focused listening). I also indicate some theoretical tools to be used in the analysis/discussion, such as *fruition space* (a subjective construct derived from the aesthetic experience of a given work); *personal sonic spaces* (Hölzl 2003, a space defined by one's subjective aural perception); and *space frames* (Emmerson 2012, an ecological and perceptual framework that articulates performative elements and spatial concerns).

Chapter 3, the central component of this commentary, has six sections, one for each completed work. Each section presents basic information about the work; its general concept; the process of composition/preparation; commentaries about presentations/performances and a brief discussion. The pieces are presented chronologically to facilitate the visualisation of evolving concepts and recurrent ideas. These are the pieces developed during this research: (1) *No Chords Attached*, a work that combines soundwalk and instrumental music through a networked feedback loop; (2) *Come Across*, a multiple soundwalk based performance; (3) *Lock 1 memories,* a GPS triggered soundwalk for mobile phones; (4) *Sienkiewicz Pipes*, a multi-channel environmental sound inspired installation; (5) *Up the Hill*, a multi-channel open air installation; (6) *A Blue Bridge*, an audio-visual interactive live performance.

Chapter 4, to conclude, presents brief remarks about the general research process, the developed pieces and point to possible future work directions.

2 THEORETICAL BACKGROUND

Now that the goals, methodology and general poetics of this portfolio have been established, before looking at the artistic outcome itself, it is important to briefly address some key topics, ideas and concepts that are at the core of this research. This chapter has two main functions in the structure of the commentary: (1) to present ideas that are relevant to my creative processes and that can make my aesthetic choices clearer to the reader, and (2) to provide basic theoretical support for the analysis and discussion of the pieces developed during this research.

Even though the ideas and concepts presented in this chapter can all be related and interconnected in several ways, they are addressed here in dedicated sections for clarity. In section 2.1, I briefly address the matter of openness, presenting a few related concepts that are on the base of my artistic praxis, such as *open work* (Eco 1989) and *process work* (Aira 1998). I also present the term of *fruition* (Eco 1997), which is a useful idea to refer to aesthetic experiences in semi-open works such as the ones in this portfolio. Next, in section 2.1.4, I briefly comment on the matter of *open-form* and how it is understood in the context of the portfolio. In section 2.2, I address the matter of listening and referentiality in the context of electronically mediated sonic practices, particularly the ones that make use of environmental sounds. In section 2.3, I make a few necessary comments on the creative use of environmental sounds and soundwalking and how such found sounds can contribute to the goals of the portfolio. Finally, section 2.4 presents a number of ideas related to space and sonic practices, such as *personal sonic spaces* (Hölzl 2003) and *space frames* (Emmerson 2012), commenting on the focus of the present research.

2.1 Openness

In a broad manner, openness represents to me a way to allow or invite the participation of other subjectivities into my artistic practice. That is, by introducing some level of openness in each work, I expect that they will be completed by the actions and/or readings of those who come across it.

As a means to address, both creatively and analytically, the matter of openness, the concepts of *open work* and *process work* are briefly presented here. Open work, a concept introduced by Umberto Eco (1989), aims to discuss semi-open, non-traditional modes of artistic creation in the Twentieth century. This concept, along with additional insights it provides, is important for the present work as it allows the discussion of several aspects of experimental music making, such as indeterminacy, formalism, ambiguity and interpretation. Process work (1998) is a creative posture described by César Aira and closely related to open work. It aligns with my artistic practice as it emphasises the importance of elaborating new approaches to artistic creation. Finally, I comment on *fruizione* (or *fruition*), a term in Eco's writings that has not been included in the English translation of the book 'Open Work' (1989), but that is unique in its way to refer to agents involved in open aesthetic experiences without designating roles.

2.1.1 Open Work

A central question in Eco's theoretical elaboration of the concept of *open work* is how contemporary artistic practices realise the balance between intentional ambiguity and clarity. Eco uses literary examples more than any others, but the concept of *open work* is thought as a general aesthetic construct, therefore suitable to examine not only written text, but other kinds of artistic practices such as theatre and music.

According to Eco (1989), the general characteristics of an open work are: intentional ambiguity; semi-defined structures; openness to reinterpretation; potentiality - its realisation, completeness occurring each time it is presented/experienced, according to the performer/reader's understanding; and uniqueness, despite its potential mutability and ambiguity.

In general terms, the openness Eco refers to is a result of clear aesthetic choices that partially deviates from a more traditional concept of work of art, aiming for a final outcome that might be flexible, collaborative, expandable, reconfigurable etc. The key quality to Eco's openness is ambiguity. Intentionally ambiguous works point to response and outcome diversity. This ambiguity can be achieved in many ways, but the two general paths discussed by Eco are structural flexibility and complexity of information. That is, one could state that Eco's openness has two main perspectives: (a) related to flexible structural and organisational aspects of the work; and (b) related to the complexity, novelty and/or multiplicity of the artistic messages; the elements intentionally placed for reinterpretation call for a much greater presence of the "personal world of the reader" (Eco 2008, p.46).

Eco links the notion of ambiguity of an artwork to the multiplicity of simultaneous meanings in one signifier (2008, p.22), but he observes that:

> This condition is present in any artwork [...] such ambiguity becomes, for the contemporary practices, one of the explicit goals of the work, a value to be achieved before others [...] (Id Ibid.).

The condition Eco refers to reveals an important dialectical relationship between ambiguity and clarity. The artistic message and the level of openness need to be balanced out so the work has its own recognisable character. That is, there is always something which is rearranged, that changes every time the work is presented/read, and something that is fixed, a structure, a message, a process that makes the work what it is.

Another implication of open works is the change toward a less romantic concept of work of art. The works are less definitive, closer to everyday life, ambiguous and less centred on the composer/author's personal figure. In an open work, the composer intentionally relinquishes control and responsibilities to other agents, sharing creative roles and stretching the process through time. A performer, while completing the work during performance, becomes co-author; the audience is called to listen/read with different levels of attention and engagement, hopefully, participating, subjectively, in a more active way; the composer assumes the audience perspective, watching his work realised in different ways according to other's interpretative choices.

Eco mentions a number of music works (1989, pp. 1-3) to introduce the idea of open work through examples. One of them, *Klavierstiick XI*, by Karlheinz Stockhausen, the performer is presented a sheet of music with several separate musical excerpts to be played in any order he/she sees fit.
The kind of aesthetic posture described by Eco, which seeks ambiguous and/or multiplying of meanings messages through non-standard presentation formats is widespread in contemporary art. Nowadays, a great number of pieces and practices could be considered open; from a hermetic play to a computer music piece that relies on algorithmic decisions to generate events and/or structure, all that is intentionally made with ambiguity can be considered open work. It is not a matter of, as Eco seemed to have done, noticing and highlighting alternative practices. Contemporary art has embraced gaps, questions and doubts as a fundamental component.

Eco makes a series of observations regarding the ambiguity in both concrete and electronic music that can be elucidative of some ambiguous aspects. Regarding the use of non-traditional sounds, volume of information and the need for articulation of elements:

> (…) if he (the composer) aims at both maximum disorder and maximum information, he will have to sacrifice some of his freedom and introduce a few modules of order into his work, which will help his listeners find their way through noise that they will automatically interpret as a signal because they know it has been chosen and, to some extent, organized. (1989, p.65)

Eco goes further talking about the use of unfamiliar timbre and complexity of the artistic message:

> The sounds themselves will consist of unusual frequencies that bear no resemblance to the more familiar musical note and which, therefore, yank the listener away from the auditive world he has previously been accustomed to. Here, the field of meanings becomes denser, the message opens up to all sorts of possible solutions, and the amount of information increases enormously (1989, p.96).

At this point, he warns about the risk of reaching a level of complexity close to chaos:

> Deprived of all indication, all direction, the listener's ear is no longer capable even of choosing; all it can do is remain passive and impotent in the face of the original chaos. For there is a limit beyond which wealth of information becomes mere noise (Ibid.).

Since the initial developments of electroacoustic music in the second half of the twentieth century, the presence of electronically created and/or processed sounds has steadily increased, being present in films, television, radio, video games etc. It is safe to assume that, nowadays, most people attending a concert of contemporary music are somewhat familiar with electronic sounds. Therefore, currently, the ambiguity, and the consequent complexity, introduced by timbre novelty in electronic pieces, as suggested by Eco, would be at least reduced, since electronic sounds are no longer completely unknown or unexpected. The anxiety caused by the effort to identify each and every sound in an acousmatic situation has also faded with time (Emmerson 2012, p. 11).

The following passage comments on the rupture both concrete and electronic music caused by not making use of the common syntax present in tonal music:

> If a musical pattern no longer necessarily determines the immediately following one, if there is no tonal basis which allows the listener to infer the next steps in the arrangement of the musical discourse from what has physically preceded them, this is just part of a general breakdown in the concept of causation. (Eco 1989, p. 15)

Even though a few decades of electronically mediated music have passed since Eco's original text, the syntax is still a source of ambiguity as most contemporary works present, in one way or another, internal rules that are partially, if not completely, unfamiliar to the listeners. I would say this is not an issue, but something to celebrate. An engaging ambiguous piece can evoke multiple readings and multiply the aesthetic message according to individual subjectivities.

In my artistic practice developed during this research, these are the main factors that can contribute to the ambiguity of a given message:

- Complexity of sonic material (environmental sound);
- Unfamiliar internal rules / non-shared syntax;
- Unfamiliar elements (timbre, technical resources);
- Hidden or unclear causalities in interactive scenarios;
- Acousmatic dislocations (Emmerson 2007);
- Volume of information.

These factors will be addressed in chapter 3 when discussing the configuration and the open qualities of each portfolio work.

2.1.2 Process Work

The writer Cesar Aira (1998) advocates that contemporary authors/creators should focus on renewing the source of strategies for the development of new artworks.

In other words, instead of making new works based on traditional formats, we should focus on creating new strategies to multiply the creative possibilities and our understanding of art in general. Aira considers, then, new ways of making art as works of art themselves; *process works* (Ibid.).

I do not necessarily agree to Aira's position, but my curiosity towards varied approaches in music creation/performance finds support in the idea of *process work*; a conscious effort to explore non-traditional paths in the hope of arriving at fresher artistic outcomes that can inspire and feed future projects. In fact, this notion seems to strongly resonate with the idea of an artistic practice based research.

The concept of process work, as refocusing the goals of artistic practices, is somewhat similar to "art as idea" in conceptual art. In both cases, there is the need of replacing traditional artistic methods for a posture of creation that might open up new windows of creative possibilities and, consequently, novel approaches toward art and culture in a broad perspective. A key difference seems to be that conceptual art configures a specific way to plan or visualise a work beforehand and then realise it or not in a physical form (Lewitt 1999, p. 834-837), while the idea of process work is less specific and proposes a general posture to avoid traditional creative paradigms and multiply new ones.

It is important to notice that non-traditional paradigms do not necessarily carry a "ground breaking" quality. The present portfolio does not claim to utilise brand new, unique or "ground breaking" formats. The aim is to present a group of pieces, with various non-traditional approaches, based on spatial referentiality and to promote a discussion based on the creative processes used and their respective artistic outcomes.

2.1.3 Fruition

Fruizione or *fruition* is a key term in Eco's writings and it has not been included in the English translation of the book 'Open Work' [5] (1989). As an important complementary notion that is particularly relevant to this research, I will make a brief commentary about it in this subsection.

The Italian word *fruizione* differs from *fruition* as it is commonly used in English. Oxford dictionaries present two similar definitions of fruition: (1) "The realization or fulfilment of a plan or project" and (2) "The state or action of producing fruit" (2015). Oxford Dictionaries also state that the original sense in English, originated from French language, was "enjoyment" and the current meaning, dating from late 19th century, derive from the association with 'fruit' (Ibid). Some other sources still indicate the original, less common sense: "enjoyment derived from use or possession" (Ramaswamy, 2012) or "pleasurable use or possession: enjoyment" (Merriam-Webster 2015).

Eco's use of *fruizione* can be understood as a combination of 'enjoyment' and 'fulfilment of something', and can be related to the way one aesthetically experiences an artistic open work, regardless of the role (listener, performer, audience etc.). That means Eco uses the same expression in reference to the way someone reads a book, interacts with an installation, performs or listens to a piece of music etc. *Fruizione* refers to the experience of realisation of a work. An open work, after being prepared with intentional ambiguity by the composer, requires

[5] In the original text of 'Open Work', in Italian, Eco repeatedly and consistently uses the expression "fruizione" (1997). However, the English translation by Anna Cancogni replaces "fruizione" and derivate terms for a number of other expressions (Eco 1989). In some cases, the translation seems to be adequate, but, in general, the clear choice to avoid the original expression creates a problem. It is safe to say that Eco elected *fruizione* as a term that could be used to better describe the aesthetic experience of a given work of art without labelling the person experiencing it. That is, fruition encompasses the ideas of 'playing', 'reading', 'listening' etc. and points to whomever is experiencing the work regardless of roles or the nature of the work. This specific term also indicates a character of action that might be absent when translated to other terms. In Cancogni's adaptations to English, there is no strong consistency regarding the substitution of the word "fruizione" and its variations. This translation strategy fails to indicate that Eco is systematically referring to the same idea, a broad notion of an active aesthetic experience in the context of open works. To illustrate, Cancogni translates 'fruizione' (fruition) to 'reception' (Eco 1989, p.4) and 'fruitore' (the person who aesthetically experiences the work) to 'addressee' (Eco 1989, p. 9). In both cases, the idea of an active role is lost and it has been replaced, respectively, for passive and neutral perspectives. Also, there are indications that Cancogni herself was, at least, partially aware of the limitations of the term 'addressee'. In another passage she replaces 'fruitore' for a list of three terms: interpreter, performer and addressee (Eco 1989, p. 19).

further completion, either by filling up structural gaps or by rebuilding its significance through subjective interpretation. The roles of composer, reader, performer, listener etc. become blurred. So Eco's strategy to refer, in a general way, to the experience/realisation of a work is to use one term only; *fruizione* (or fruition). The term also implies a more active, participative experience.

This portfolio is composed by six semi-open pieces that do not share a common presentation format and/or compositional strategy. For that reason, the terms 'fruition' and 'fruition agent' will be used throughout this text to refer, respectively, to the aesthetic experience (*fruizione*) of each work and to the agent (*fruitore*) taking part in such experience.

2.1.4 Open-form

> When formal elements become part of a texture, they diversify, introducing both repetition and difference. They articulate the whole, facilitating both movement from the parts to the whole and, conversely, the mustering by the whole of its component elements (Lefebvre 1991, p. 150).

As observed previously, the ambiguity of a given piece can be determined by the flexibility of its structural components. In this subsection, I will make a few observations about formal structures and openness so the reader can have a clearer idea of how *open-form* is considered in this text. This is, no doubt, directly related to *open work* and it is being addressed separately in a complementary manner given its relevance and the need to comment on specific ideas.

Structuring elements are rather important to establish the limits of openness in the portfolio. Even working with open-forms there is always underlying structural components more or less apparent/accessible to the fruition agents. Regardless of whether or not this open-form is linear, its structural components are always

present. In all portfolio pieces, the open-form derive from some spatial idea, or spatial reference.

I understand open-form as a set of framing and constraining elements dynamically arranged which help to shape the composition as a potential experience, leading to varied results. From this perspective, Schoenberg's general statement about the organisation of music still applies:

> Without organisation music would be an amorphous mass, as unintelligible as an essay without punctuation, or as disconnected as a conversation which leaps purposelessly from one subject to another (1970, p.1).

From the perspective of compositional practices of notated music, in which the document that registers the characteristics of the works is often taken as the work itself, *form* can be understood as:

> The shape of a musical composition as defined by all of its pitches, rhythms, dynamics, and timbres. In this sense, there can be no distinction between musical form and specifically musical content, since to change even a single pitch or rhythm that might be regarded as part of the content of a composition necessarily also changes the shape of that composition, even if only in detail. The term form is also applied, however, to abstractions or generalizations that can be drawn from groups of compositions for purposes of comparing them with one another. A form in this sense is defined by a loose group of general features shared in varying degrees by a relatively large number of works, no two of which are in fact exactly the same (Randel 2003, p. 329).

Neither of Randel's definitions can be applied to this portfolio as the compositions aim at proposing a "(…) number of possibilities (…) rationally organized, oriented, and endowed with specifications for proper development (Eco 1989, p. 19)". The works are not absolutely composed of fixed and pre-determined elements, therefore changes and/or variations of its details will not mischaracterise them. The open-form, or that what makes a work something else than a random proposition, is a set of previously chosen criteria that establish a "field of relations" (Eco 1989, p. 19).

> (…) there exist works which, though organically completed, are "open" to a continuous generation of internal relations which the addressee [fruition agent] must uncover and select in his act of perceiving the totality of incoming stimuli (Eco 1989, p. 21)

The term *structure* is used in this text in a broad perspective. A brief look at dictionary definitions for the word *structure* might prove useful to reflect on its multiple meanings. The first of the main definitions on Meriam-Webster online dictionary states that structure is "the way that something is built, arranged, or organized" (2015). This seems fairly adequate when applied to my musical practice. Independent of format and level of openness, there is always a structure that defines how the elements are organised, making a given piece recognisable. Another interesting definition states that structure is "something (such as a house, tower, bridge, etc.) that is built by putting parts together and that usually stands on its own" (Ibid.). I particularly like this architectural definition because, if read metaphorically, it might point to a compositional scenario that integrates several elements that have to fit and present a minimum level of coherence. But maybe this definition is not dynamic enough. Structure as "the aggregate of elements of an entity in their relationships to each other" (Ibid.) is a definition that gets closer to the way I see an ideal semi-open configuration.

Eco uses the word "structure" as synonym of form. In this context, he states about *open work*:

> (…) the new musical works (…) reject the definitive, concluded message and multiply the formal possibilities of the distribution of their elements. They appeal to the initiative of the individual performer, and hence they offer themselves not as finite works which prescribe specific repetition along given structural coordinates but as "open" works, which are brought to their conclusion by the performer at the same time as he experiences them on an aesthetic plane (1989, p. 3).

Similarly, I consider structure, or the structural components, as the more stable aspects that might define internal rules, boundaries, 'what can be done' or 'how far one can go'. In an open scenario, in face of a new fruition experience, one has to

decode, at some level, its message and make sense of what is being presented to him/her. In this perspective, the *form* is something that can be apprehended from the presentation of a work, something that has a logico-spatial nature.

> The term 'form' may be taken in a number of senses: aesthetic, plastic, abstract (logico-mathematical), and so on. In a general sense, it evokes the description of contours and the demarcation of boundaries, external limits, areas and volumes (Lefebvre, 1991, p. 148).

This is idea of form, as "description of contours" and "demarcation of boundaries", aligns with my general approach to structuring. I tend to look at new music pieces as propositions of micro-universes with their own rules, spatial components and limits. These spatial features might be more apparent in a *physical* manner, when physical components of the space in which the work is presented have a considerable influence in the fruition experience (e.g.: *No Chords Attached*, *Lock 1 memories*, *Up the Hill*, *A blue bridge*); in a *representational*[6] manner, in situations in which a representational device is key to define boundaries (e.g. *Come Across*, *Sienkiewicz Pipes*, *A Blue Bridge*). The combination of physical and representational features should impact the imagination of the fruition agent, forming a *subjective* space, or a subjective spatial perception.

Caesar, commenting on a general compositional approach, states:

> Composers usually identify two main stages of work that, as the composition progresses, eventually confound and merge into each other. The first corresponds to the production and selection of 'objects', or 'units' (sounds, motives, cells, etc.), which, in a second stage, are given some existence within a 'structure' of some sort. When already elaborating a work in this second stage, composers will return to the first: if one of the chosen 'objects' does not perform as expected at a more 'structural' level, it must be discarded, replaced or rebuilt (1992, unpaginated).

[6] Representation is understood here neither in a *reflective* (when meaning lies in the object itself and the representation faithfully mirrors its meaning) nor in an *intentional* (when the author of a given message "imposes his or her unique meaning") perspective, but in a *constructionist* manner that considers a "(…) public, social character of language [, acknowledging] that neither things in themselves nor the individual users of language can fix meaning in language. Things don't mean: we construct meaning, using representational systems - concepts and signs" (Hall 1997).

This movement of revaluating initial compositional choices commented by Caesar is fundamental in this portfolio, since all the planning and framing is focused in reaching the fruition stage. The works are not their plans, but their presentations/performances. The portfolio works are potentialities brought to life when performed/presented/experienced, that is, during its fruition. Whatever it is that provides the basis for its execution (a score, a tape, a piece of software mapped to an interactive system etc.) is something that lays out a more or less structured plan to make the resulting music possible. And each realisation is unique, since it depends on a number of factors (e.g. agent's subjectivities, rules, space). Therefore, the conceptual/material support of the work is not the work itself, but it carries great importance as it constitutes the means to its realisation. In this portfolio I have tried to structure each piece with the aid of spatial references so the resulting form, emerging during fruition, could convey its boundary qualities.

2.2 Listening

> When thinking about the transformed acoustic meaning that a familiar sound acquires when its whole sound field is considered, I ask myself, What is this sound that I am now hearing? The answer I give is that this sound is all the possible ways there are to hear it (Fontana 2008, unpaginated).

It is certainly next to impossible to deal with composition without thinking about *listening*. For this portfolio, which deals with non-traditionally formatted pieces and environmental sound, reflecting on possible listening perspectives is fundamental. Listening is an important path for acquiring knowledge about the world and the social reality around us. And since we can "tune our ears" in different ways, turning our attention to previously unnoticed sonic details of our surroundings, listening can be the first step toward learning new things and reaching new insights. Refocusing our listening carries a transformation potential.

> Listening in a positive way, that is, actively taking the decision to focus on certain things and reject others is a very positive and creative thing to do. For me (…) it actually stimulate my thought process, (…) it makes me think in a different way. That's why I find it so satisfying. […] Our world is a far more interesting place when you can tune in and do that [listen] (Ljudets färg: Alla hav låter olika 2007).

A number of different listening perspectives, relevant to this portfolio, will be addressed in this section.

2.2.1 Reduced Listening

Pierre Schaeffer developed from the practice of his Musique Concrète an important listening perspective; *reduced listening*. Briefly defined by Chion: "Reduced listening: Listening for the purpose of focusing on the qualities of the sound itself (pitch, timbre, etc.) independent of its source or meaning" (1994, p. 223).

Musique concrète explores the internal materiality of sound fragments, moving away from the abstractions of organised pitches of traditional instrumental music. The adjective *concrete* refers to the direct way, almost physical, of manipulating sounds. On the other hand, reduced listening, by negating the knowledge of the sources and all referentiality, promotes a listening experience empowered by a personal abstraction effort. Emmerson presents a similar view when he states that "Acousmatic music has removed these specific [sound] objects from a dependence on actual material causes, thereby liberating the imagination to reconstruct an imaginary discourse" (1994, p. 99).

> (…) musique concrète locates sound's liberation through ideal configurations, harnessing sound's intrinsic ambiguity or malleability so as to create distinct auditory experiences abstracted from an original source, beyond or in spite of material reference (LaBelle 2015).

Schaeffer's listening perspective represents an important paradigm shift for it places everyday sounds in a position of relevance and questions the way we hear. This philosophical questioning has a social impact, as discussed by LaBelle:

> Musique concrète […] offers a […] voice in the move toward everyday life in the postwar period, initiating a liberated listening not as social transformation but as perceptual intensity. For such acoustical investigations and subsequent diffusions altered not only the understanding of what music could be but how the ear might listen to the world (2015, unpaginated).

One might say, then, that reduced listening, coming from a *concrete* practice that avoids the abstractions from traditional instrumental music, requires an abstract listening posture that can potentially contribute to multiply the ways we listen to the reality around us. It is an interesting arch; from concrete, through abstract, returning to concrete.

2.2.2 Reclaiming referentiality

Schaeffer's acousmatic music and reduced listening effectively opened up new aesthetic possibilities for sound arts and have influenced composers for decades. According to Emmerson:

> This puritan view [of reduced listening] was a fundamental stage in sound art (…) [,] But since the 1960s there has been a greater acknowledgement of a tension founded on the very basis of our ear/brain operation. It proves very difficult to hear sound only in terms of an appreciation of its shape and spectral properties as Schaeffer seemed to advocate (1998, p. 136).

Therefore, Schaeffer's effort to absolutely erase any referential traces from sound was bound to be questioned in the name of other creative and intellectual enterprises.

A clear example is what the composer Luc Ferrari called 'Anecdotal music', "(…) lengthy real-world recordings [that] serve as the basis of a sound-based work, whether further treated sonically or not" (Landy 2007 p 31). Ferrari's piece *Presque Rien* (1970) uses lightly edited, non-processed found sound, directly exposing its

referentiality. The sonic images are clear recordings made on a village on the former Yugoslavian coast. The sound sources are fairly identifiable, but the broad sonic image invite our individual subjectivities to contribute to the creation of varied narratives.

> Ferrari's "anecdotal" work brings to the surface the split between associative or referential material and an ideal sonorous object by veering toward a concern for the sound source and its referent as autobiography and individual psychology: the diaristic acoustical mapping of an individual over the course of a single day and how such sonic snapshots may, in turn, reveal conditions of real life (LaBelle 2015, unpaginated).

John Cage's efforts to "free" sound and point to a music of any and all sounds also contributed to link our listening to the musical possibilities of found sounds. Labelle elaborates:

> Reference to its source underscores sound in such a way as to encourage, or set the stage for, liberated perception, for it insists upon the direct correlation between music as a culture of listening and sound as indicator of everyday life as found in material objects and their ultimate appropriation. Such performativity underscores material presence by establishing reliance on the sound source as a signifier from which sounds arise and, in a sense, return. For as listeners, we are asked to hear sounds as liberated from traditional representational devices of musical composition through the very material source (2015, unpaginated).

And yet, since our perception has its own subjective representational devices, they will be always a component of our listening experiences. In addition, from the moment the composer establishes a framing, he is determining a selection, a partial view and any elements involved in the process will also mediate the experience. There is an intention and a technological mediation in the process of recording. Chion, borrowing from film vocabulary, refers to the partial capture of reality mediated by microphones as *tournage sonore* or "audio shoot"[7]. From a

[7] As translated by Landy (2007, p. 89). Caesar (1992) suggests another translation, "mike-shaping", in direct reference to the microphone mediation.

similar perspective, Francisco López (2006, p.84) states "(…) even if we don't subtract or add anything to the recording, we cannot avoid imposing on it our version of what we consider to be reality", since the recording process mediates and establishes a partial point of view derived from the artistic choices of the recordist. On the other hand, in his practice, he avoids interfering further, neglecting the use of elaborate procedures.

> When the representational/relational level is emphasized, sounds acquire a restricted meaning or a goal, and this inner world is dissipated. I'm thus straightforwardly endorsing Pierre Schaeffer's concepts of the "sound object" and of "reduced" or "acousmatic" listening. I prefer the term "matter" to "object," because I think it better reflects the continuity of the sonic material one finds in sound environments, a continuity affirmed by the non-representational approach to sound recording. I also prefer the term "profound" to the term "reduced" because the latter connotes simplification (López 2006., p. 85).

Lopez positions himself as an endorser of Schaeffer's ideas, choosing to rename some key expressions (*sound object* to *sound matter*, *reduced listening* to *profound listening*). But the difference here seems to be greater than just terminology. Schaeffer's concept of sound object depends on the composer's freedom to isolate sonic fragments to be used in a composed, arranged product. Lopez's sound matter, on the other hand, relies on a much more continuous, non-edited scenario, in which referentiality is partially maintained. While Schaeffer tries to alter sounds to hide its referential qualities, Lopez relies on the original textural qualities of complex environmental sounds to surface in one's perception through profound listening.

> In my work with nature sound environments, I have moved away from the rationalizing and categorizing of these aural entities. I prefer this environmental perspective not because it is more "complete" or more "realistic" but because it encourages a perceptional shift from the recognition and differentiation of sound sources to the appreciation of the resulting sound matter (2006, p. 83).

A recurrent misconception is that the term 'concrète' was used by Schaeffer to indicate "(…) a music of (…) sounds of the world" (Kim-Cohen 2009, p. 9). The

designation concrète does not concern the sonic material used in the compositional process. It refers to the way the sound is accessed and manipulated: directly, neglecting any previous intellectual and abstract organising system (Schaeffer 1950; Schaeffer 2002, p. 14; Chion 2001, p.13). On the other hand, the acousmatic condition, by removing references to the sound sources, creates the need for an abstract organisation of elements. Reduced listening also consists of an experience of abstraction, in which the listener focuses on sound qualities disconnected from any concrete reality.

In response to the abstraction present in musique concrète, Darren Copeland (1995) proposes a sonic practice that asks for what one could call *concrete listening*. That is, considering sounds not only "(…) for their spectral richness or pitch/rhythmic characteristics, but for their imagistic value, or rather, the associations triggered in the imagination of a listener" (Ibid., unpaginated). He suggests the use of sound in a strongly referential way, avoiding "(…) filtering out – isolating and abstracting – the smallest particles of [its] richness" (Ibid.). This approach would allow an "audio realism" to emerge, promoting an imagistic sonic art "(…) aimed at challenging the importance for the acousmatician in continually divorcing sounds from their everyday contexts" (Ibid.).

Moving further toward referentiality, Kim-Cohen (2009) advocates a non-sensual form of listening he calls "non-cochlear". According to him, the sound arts have failed to embrace the conceptual perspective as the "gallery arts" have after the Second World War. A non-cochlear listening would actually refer not to the sensual, physical act of hearing, but to a concept that establishes a referential link to social and political concerns (Ibid.). One could say that a non-cochlear sound is one hundred percent referential, whilst "A conceptual sonic art would necessarily engage both the non-cochlear and the cochlear, and the constituting trace of each in the other" (Kim-Cohen 2009, p. xxi). Therefore, Kim-Cohen does not intend to renounce sound, his vision of a non-cochlear sonic art points to a practice that "(…)

does not accept the resolution of sound-in-itself — not because it seeks another kind of resolution, but because it denies the possibility of resolution, ipso facto" (Ibid., p. 260).

In this portfolio, I do not follow a specific 'school of listening'. In one way or another, all those contemporary listening perspectives contribute to elevate the importance of everyday sound as they, ultimately, draw attention to the practice of listening as something else than a banal, background human activity. In general, I am interested in focusing and re-focusing the listening to components of everyday life. The works developed during this research are attempts to highlight excerpts of mundane sonic elements/environments. I do not expect the listener to perceive things my own way or in any specific way. Nevertheless, I do hope that the spatial, contextual and performatives framings of each piece will provide an opportunity to instigate alternate listening attitudes that will occur, invariably, according to individual subjectivities. The compositional choices made in each work enable a rhetoric strategy that makes use of *synecdoche* and *asyndeton* effects, respectively highlighting elements of a given sonic context and eliminating others (Augoyard and Torgue 2005, pp. 123-124).

The use of environmental sounds in the portfolio is directly related to the effort of presenting referential sonic elements, rather than abstracted sound materials. Therefore, referentiality is an important intentional component of the works.

2.3 On Environmental sound

> A listener needs time to progress from an initial listening encounter with the soundscape to a state of engaging actively and fully in scanning and exploring the spectromorphological and spatial properties on offer (Smalley 2007, p. 37).

This section is meant to address some specific notions related to environmental sound and its use in compositional practices.

The use of environmental sound as main material for the pieces in this portfolio was motivated by three things: (1) my interest in its complexity and unpredictability; (2) the impregnated spatial qualities it carries; (3) the challenge of listening to places and its referential sounds.

2.3.1 Soundscape / Environmental sound

Although it is not uncommon for works based on environmental sound to be described as "soundscape compositions", the designation might bring unwanted associations. The term *soundscape* is originally described by the composer R. Murray Schafer as:

> "The sonic environment. Technically, any portion of the sonic environment regarded as a field for study. The term may refer to actual environments, or to abstract constructions such as musical composition and tape montages, particularly when considered as an environment" (Schafer 1994, pp. 274-275).

Even though this definition seems impartial enough, the term was developed in the context of Acoustic Ecology, a discipline with specific ecological focus that does not necessarily align with my practice. Hegarty states about acoustic ecology:

> Drawing attention to sounds from around the world becomes important, as does the preservation of 'soundmarks', whether natural or well established social sounds. Acoustic ecology also seeks to limit noise, specifically human noise that interferes with the soundscape of 'the world' (2008, p. 173).

In addition, the term *soundscape composition* is described by Truax (1996) as a particular format unconditionally tied to the goals of acoustic ecology. According to him:

> (…) the basic aim [of soundscape compositions] was not to further exploit the environment as a source of musical material but rather to exploit the knowledge base of musical design in order to redesign the soundscape, and to reawaken people's perceptual appreciation of its importance (Ibid., p. 53).

Truax goes further and states that "the ultimate goal of the soundscape composition is the reintegration of the listener with the environment in a balanced ecological relationship" (1996b, p. 14). In the same text, he argues against "(…) the European tendency to overvalue abstraction" (1996b, p. 13) and suggests that the use of abstracted environmental sounds have led, in cases, to situations in which "(…) one cannot identify the cultural origins of a piece of music or its composer (the artistic equivalent of the McDonald's hamburger)" (Ibid.). Considering such territorial argument[8], I tend to agree with López when he affirms:

> A musical composition (no matter whether based on soundscapes or not) must be a free action in the sense of not having to refuse any extraction of elements from reality and also in the sense of having the full right to be self-referential, not being subjected to a pragmatic goal such as a supposed, unjustified re-integration of the listener with the environment (1997, unpaginated).

Considering the paragraphs above, to avoid any misunderstanding, I have chosen not to use the terms "soundscape" and "soundscape composition" throughout this thesis. The less ambiguous expression *environmental sounds* will be used instead.

[8] Acknowledged and corroborated by others (Westerkamp 1999; Gomes 2015).

Regardless of terminology, I am interested in the richness and potentiality of found sounds, sounds of everyday. The portfolio reflects this interest by proposing a number of scenarios in which these sounds play a central role. As Drever states:

> By providing a space for our ears to be open in the everyday, and open to the everyday, much knowledge can be gained of its implicit structures and suggest future configurations (2009, p.35).

In the portfolio, environmental sound is source of material to create an *artefact*; something that differs from the objective, factual reality, a construct mediated, not only by technological devices, but by my subjective choices of selecting, re-arranging and highlighting elements. In that sense, the works assume the artistic condition as proposed by Emmerson in the following passage:

> In cinema […]: the sound effects, the speech and the background are now largely post-produced – we would indeed reject the 'original' as paradoxically less 'real'. But there is no contradiction here: the aim is an artefact, not a fact. In that it mimics nature and experience, art is fake, not an original: but as soon as that is realised it has the power to become original in its new context (Emmerson 1994, p. 96).

Likewise, the artefacts in the portfolio depend on their realisations through the choices and subjective readings of fruition agents.

2.3.2 Soundwalk

> Soundwalk work is far from detached. The recordist's perspective is written into the recording, into the listening, touching, experiencing and moving through the space (McCartney 2014 p.221).

Soundwalking is a fundamental practice in this research. It allows me to investigate places with their particular sonic realities in an insightful manner, contributing to all the portfolio pieces, even when not present as a performance element.

> Soundwalks form a bridge between the everyday experience of walking, and mindful, creative listening, framing what could be an everyday activity and giving this experience the potential for listening and thinking about sound in the environment (McCartney 2010, unpaginated).

In the portfolio, four out of six pieces have soundwalking as a central element; *No Chords Attached* (live, networked walk), *Come Across* (multiple simultaneous recorded walks), *Lock 1 Memories* (live soundwalk with superimposed filed recordings) and *A Blue Bridge* (recorded walk). The other two pieces (*Lock 1 Memories* and *Up the Hill*) emerged from soundwalking and field recording.

Soundwalking is a powerful way to explore the aesthetic potential of environmental sounds around us. According to McCartney, "Soundwalking is a creative and research practice that involves listening and sometimes recording while moving through a place at a walking pace" (2014, p. 212). It allows the listener a great level of freedom in an immersive complex network of everyday life events. Walking makes ourselves an active and dynamic part of a given space, it "(…) might be seen to enact a *mediating action* in whose configurations the meandering flow of private life and the geometrics of public institutions meet" (Labelle 2010, p.91).

Schafer (1994) makes a distinction between *soundwalk* and *listening walk*. According to him, "a listening walk is simply a walk with a concentration on listening (p. 212), while the soundwalk:

> (…) is an exploration of the soundscape of a given are using a score as a guide. The score consists of a map, drawing the listener's attention to unusual sounds and ambiance to be heard along the way (Ibid., p. 213).

Schaefer's definition seems to be unnecessarily limited in three ways: (a) it underestimates the potential of a focused listening attitude without the guidance of a map; (b) it fails to consider that the listener's guidance, in a particular experience, can be made by something else besides a map, and (c) it fails to acknowledge, or recognise, other scenarios in which the walker might adopt a more creative and active attitude during the experience. Westerkamp's (2007) more neutral and broader perspective suggests that "a soundwalk is any excursion whose main purpose is listening to the environment" (unpaginated). From a similar perspective, in the present research, the term *soundwalk* will refer to any activity that consists of exploring an area through walking and attentively listening to surrounding sonic elements, regardless of the nature of the sounds or possible technologic mediating apparatus.

When discussing Westerkamp's Soundwalking show at Co-op Radio[9], in which field recordings made in Vancouver were broadcasted, McCartney observes:

> [The] show was always connected directly with the place of recording. The radio listeners lived in Vancouver, where the recordings were made. During or after listening to a show, they could do a soundwalk in the same site and hear how it sounded. Soundscape theorist Murray Schafer was concerned about how the mediation of sounds as they are dislocated from their source make them schizophonic[10] (a term invented by him that means sound split from its source, that can also imply schizophrenia and mental

[9] http://www.coopradio.org/.

[10] "(…) the split between an original sound and its electroacoustic reproduction. (…) I employ this 'nervous' word in order to dramatize the aberrational effect of this twentieth-century development" (Schafer 1994, p. 273).

> disassociation). However, schizophonia can also lead to schismogenesis, or the birth of new perspectives. (…) Putting interpretations of soundwalk experiences into different historical and geographical contexts can lead to further insights (McCartney 2014 p.223).

In this portfolio, the mediation, reorganisation and re-contextualisation of soundwalks are considered positive and desired components of the works. Through spatial relocation, transmission and content alteration I intend to introduce my compositional framings, sharing my perspectives in ambiguous ways, assuming soundwalking as a personally engaged process.

2.3.3 Collapsing Time

> Traditionally composers have located the elements of a composition in time. One idea which I am interested in is locating them, instead, in space, and letting the listener place them in his own time (Neuhaus 1994, p.34).

Even though "(…) aural phenomena are much more characteristically vectorised in time, with an irreversible beginning, middle, and end, than are visual phenomena" (Chion 1994, p. 19), sound still occurs in space. It can announce its spatiality through acoustic imprints (reverberation, "colour" of sound/early reflections); directionality of the sources; content referentiality etc. Those spatial features can be explored to attenuate sound's intrinsic vectorisation in time. In the present research, this is often pursued, going in an opposite direction of traditional instrumental music that tends to keep a sequential flow by interconnecting adjacent elements/ideas to "move" the composition forward.

The embedded spatiality and textural qualities of environmental sounds seem to afford a listening mode that partially moves the attention from "what" to "where". Ulrich states that "Where there is no sequence for the sound, its spatial dimensions come to the fore – the dimension that describes its scope" (Ulrich 2005, p. 5). Certainly, it is often possible to identify sequential elements in a given

environmental sound scenario. Nevertheless, such sequences are of a complete different nature than the one usually found in western instrumental music traditions. Environmental sounds are usually more textural and its gestural elements follow a more chaotic order. Dennis Smalley's explanation of how he listens to a particular environmental scenario can be elucidative:

> The temporal disposition of, and relations among, sounds serve to articulate and shape spectral and perspectival space, but even though my perception of sound is the product of time, I ultimately sideline time's formative role. So space can be more significant than time, or at least we can profit by starting with the idea that time can be placed at the service of space rather than the reverse. Time becomes space (Smalley 2007, p. 38).

In the context of this portfolio, the effect of 'time becoming space' through the use of environmental sound, aims to contribute to the empowerment of the *fruition agent*. By focusing on spatial referentiality the fruition processes tend to be less linear as the agents, according to their subjective perceptions, might have, like Smalley, an alternative listening perspective, asking questions, such as: "where is this sound from?", "where does it belong to?", "where did it happened?", "where is it happening?". The temporal component is not eliminated, but space plays an important role.

2.4 Space

Space is a broad concept that can be approached from many different perspectives in several disciplines. Providing a general and complete discussion on 'space' is outside the scope of this thesis. Instead I shall address a few ideas and concepts that were used in the development of the portfolio and that can facilitate the subsequent discussion based on my personal artistic practice. These selected theoretical constructs constitute a way to, mainly, reflect on the following questions:

- How the notion of space can help to structure experimental music / sonic art pieces?
- Which spatial elements can be present in the fruition process?
- Can they convey a sense of structure or direction, contributing to the formal aspect of the works?
- Can spatial features refer to places or elements that might resonate with the fruition agents*?*

2.4.1 Spatial perspectives

When we get to an unknown place for the first time, it is normal to look around in search for references, for known elements that could help us determine where we are, not necessarily in terms of coordinates in space, but in functional and cultural terms. That is, we might want to know who occupies that space, what they do, what the dynamic is, how others perceive us, what the story of the place is, what we can do there, how the place connects to other adjacent places[11] etc.

[11] In the interest of clarification, the term *space* is used here as a general abstract geometric concept (McAuley 2005, p.35), while *place* is thought as something with a cultural dimension (Augé 2002, p.9). "A place owes its character to the experiences it affords to those who spend time there (…) It is from this relational context of people's engagement with the world, in the business of dwelling, that each place draws its unique significance (Ingold 2000, p. 192)".

Very often, when I first face a hermetic piece of music, I feel 'curious' in a similar way. The particular performance configurations, internal set of musical rules are unknown and I need to know "where I am" and what "kind of place" the music is. I need to localise myself to avoid being lost. As Lynch stated "The terror of being lost comes from the necessity that a mobile organism be oriented in its surroundings" (1990, p. 125). So I try to piece together all the sensory information reaching me, timbre, sound directionality, compositional logic, position of musicians on stage, possible interactions and relationships between musicians and their equipment and also among themselves.

This metaphor, each piece as a self-contained micro-universe, is helpful to organise my compositional work. The spatial components contribute to determine what kind of "place" a piece is; what and where the elements are; what is the dynamic, the internal relationships etc. By letting part of these spatial components surface, as representational elements and physical spatial references, I expect to allow the audience to make sense of the particular 'universe' of each piece. In a general perspective, these are the components I am considering:

- Physical spaces: spaces in which the field recording were made; spaces where fruition might occur (concert venue; gallery; open space);
- Sonic elements: binaural recordings, spatialised sounds;
- Visual resources (representations/indications): maps, pictures, videos etc.

Managing those components in multiple ways, I aim to establish perceptual indicators for each work. Such indicators should work in a way to, according to how it resonates with each individual subjectivity, establish boundaries in a multi-modal sensorial horizon I will call *fruition space*. This multi-modality is somewhat similar to Copeland's notion of *acoustic horizon* (2000, p. 23), a concept derived

from John Hull's[12] commentary on how sound can establish clear perceptual horizons for blind people. The idea of fruition space is also close to Cahen's *Auditorium*:

> (…) a psychic space drawn and constructed from a Gestalt of perception, an affect of the environmental on the personal; a spatial, cultural and experiential framework that contextualises the meaning of a state of being at that moment (2015, p. 2).

In a fruition situation, our senses are often redirected, focused or limited (e.g., in a dark concert room), and in these non-ordinary artistic scenarios, we are prompted to re-evaluate the rules of temporary "realities" according to the sensory stimuli made available to us.

Now, this fruition space is not meant to be a collection of uncoordinated elements, but a system with a relational potentiality much like in Hatfield's following elaboration:

> Leibniz argued that space is constituted by relations among bodies. Space is the perception of the order of coexistences — or rather, of possible relations of coexistence. Bodies at an instant have a set of actual relations among themselves, the idea of space comes from recognizing that they could be otherwise ordered (2006, p. 65).

As Emmerson stated, "Space is not simply a geometric 'thing out there'" (2008, p.78), space is also that what we create in our subjective perception by putting together objects, agents and their relationships.

[12] "Personal interview with John Hull. Recorded on July 7, 1997 at the University of Birmingham in the UK" (Copeland, 2000).

2.4.2 Sound in space

After establishing the general idea of *fruition space* in the previous section, it is appropriate to quickly address some concepts that focus on the spatial aspect of sound. First, *personal sonic space*, a simple analytical listening perspective presented by Hölzl (2003); following, Chion's *composition* and *listening spaces* (2009), and lastly, Emmerson's *space frames* (2012).

Hölzl proposes the idea of *personal sonic space*, a space defined by one's subjective aural perception. This personal space is divided in three stages, *inner*, *meso* and *outer sonospheres*, spherical spaces with different radiuses enveloping the listener. The inner sonosphere would include close and clear sounds sources that are on the focus of the listener's attention. The meso-stage corresponds to more disperse, not so close sounds. The outer sonosphere includes very distant sound sources, less likely to require immediate attention from the listener (Ibid., pp. 5-6). Hölzl considers that the triad of sonospheres can be helpful to analyse our "acoustical awareness" (Ibid., p. 6). The concept of sonospheres proposes a didactic, hierarchic approach based on distance and attention. In the context of the present portfolio, this subdivision of one's aural range can be invaluable to analyse environmental sound content, considering situational and functional implications. This perspective can also be useful when "(…) creating artificial sound-spaces" (Ibid., p.5).

When discussing fixed acousmatic music, Chion (2009) considers two spaces: (a) *composition space* and (b) *listening space*. The first one refers to the final sonic outcome as created by the composer in his work space (e.g., multi-channel studio), which includes the sound elements used and their characteristics, such as volume, dynamic changes, channel distribution, spectromorphology and reverberation qualities. The second one refers to how the outcome, even in a fixed format, is realised in a listening space and with conditions that mediate the listening experience (e.g., room dimensions, shape, absorptions and reflection qualities,

speakers configurations, spatialisation techniques used, filters applied etc.). While the research presented here does not deal with conventional fixed electroacoustic music, Chion's perspective points to a relevant matter of being aware and critical of the differences between the composition and presentation/performance (fruition) stages. Chion's spaces will not be used in this commentary as theoretical tools to analyse the works. The relevance of such concepts primarily resides in my creative posture and the awareness of the differences between composition and presentation stages.

Emmerson (1998, 2007, and 2012) presents an ecological and perceptual framework, *space frames*, which addresses both compositional and performative concerns. This notion suggests the division of our sound and space universe into four components of increasing scope: *event*, *stage*, *arena*, *landscape* (Ibid. 2012, p. 7).

> "Our mechanical sound universe existed[13] from the level of a *landscape* (bounded by the acoustic horizon) part of which we designated an *arena*, within which we found a *stage*, upon which we framed an *event* (Figure 1) (Ibid. 2007, p. 97).

In a performance scenario, the broader *landscape* and *arena* frames are related to *field* functions, which "(…) create a context, a landscape or an environment within which *local* activity may be found" (Ibid. 2007, p. 92). *Stage* and *event* frames relate to "*Local* controls and functions [that] seek to extend (but not break) the perceived relation of human performer action to sounding result" (Ibid.).

[13] Emmerson uses past form in this passage for he is making reference to a text he had written previously.

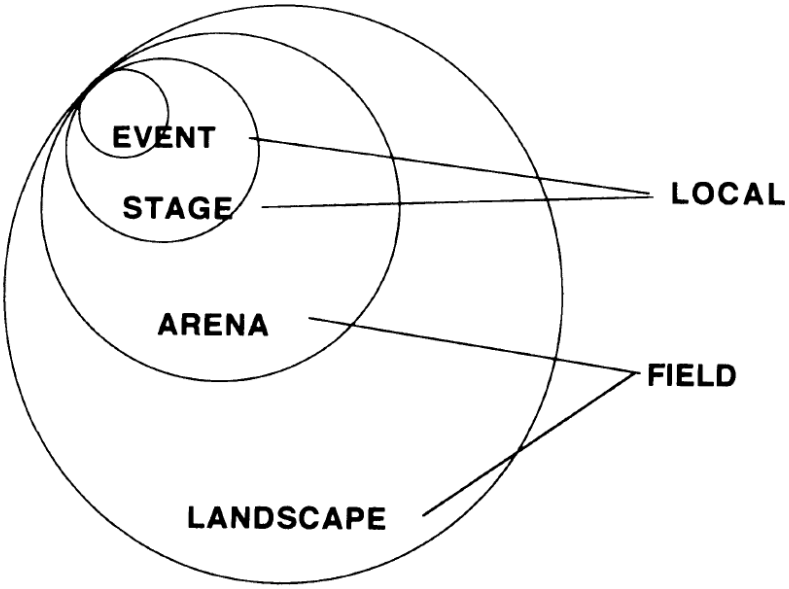

Figure 1: Emmerson's space frames representation (1998, p. 138)

Emmerson advocates that "(...) sound in general (and electroacoustic music in particular) can evoke a sense of being and place which may be strongly related to our visual experience" (1998, p. 135), and the notions of *space frames*, *field* and *local* functions may help address this relationship between "audio and visual arts forms" (Ibid.).

Regarding the creative possibilities through technology mediation, Emmerson states:

> "Electroacoustic means also give composers the opportunity for superimposition of different (perhaps conflicting) frames, different stages, arenas or landscapes may be superimposed and more importantly transformed (Ibid., p. 138).

Emmerson proposes this abstract construct based on perceived phenomena mainly as an approach to composition. I believe the notion of space frames can be equally useful as analytical tool, for it allows an abstracted, schematic look at compositional strategies that involve combinations of physical and *imagined* spaces. This framing perspective will be used in this thesis to look at the way physical and representational spatial elements are used in the portfolio.

2.4.3 Physical, representational and subjective spaces

In a radical sense, one is incapable of apprehending any fragment of reality as it is. That is, the epistemological pathways include our senses, perception and judgement. Therefore, strictly, any space one encounters is subjective to some degree. From a less strict perspective, I will consider a distinction among (1) geometrical, *physical* spaces configured by its basic stable measurable configurations; (2) spaces indicated or erected by *representational* devices (e.g. visual representations, virtual reality, sound spatialisation resources etc.); and (3) *subjective* spaces, corresponding to the ones formed in one's mind when accessing memories or interpreting a constructed narrative.

For comparative reasons I present Peter Traub's three categories of space used in his compositional practice: *physical*, *abstracted* and *hybrid* spaces (2010). He briefly elaborates:

> Physical space includes all of the existing space of the world, whether built or natural. I define abstracted spaces as artificial spaces created through electronic technology and decoupled from the rules of the physical world. Hybrid spaces are created when elements of physical and abstracted space are combined. These categories are proposed as a means to better understand the compositional poetics of space-focused approaches. They also show how one might go about categorizing notions of space for sonic composition. While the category borders are somewhat fluid, they provide a guide to the parameters of aural space (Ibid., p. 3).

Traub clearly states that he is focused on "(…) the compositional use of these spatial categories, and on how they extend the domain of spatially-based composition. Listener perception and reception are beyond my scope (Ibid.)." Although, in this research, I am not proposing to investigate the listener's perception of the developed pieces, my approach considers that physical and representational components, devices intentionally used to articulate the framing of spaces in each piece, can influence the fruition processes.

In the following passage, Emmerson refers to live transformation of sound, bearing spatial content, which constitutes, according to my perspective, a representational device meant to be decoded in a subjective fruition process:

> "I wish to argue that live transformation (even of an apparently 'abstract' kind) creates landscape functions which our Darwinian ear attempts to relate to real-world experience. The auditory system searches to establish its frames of reference to spaces real and imaginary" (Emmerson 1998, p. 139).

So the *subjective space* I refer to is the consequence of the confluence of real-world spatial features, representational devices and the personal constitution of the *fruition agent*. As I have no access to the latter, as a composer I try to manipulate the first two in order to devise a potential fruition scenario, balancing clear and ambiguous elements. Therefore, the use of semi-open structures and/or complex information is meant to provide a fertile ground for the conceptions of intertwined spaces, partially dependent on the subjective character of the fruition process.

It is important to point out that the composed spatial scenarios in the portfolio are made possible by the use of mediation resources, including what Emmerson (1994) refers to as *acousmatic dislocations*. There are three types of *acousmatic dislocations*, introduced by the development of new technologies, which had a considerable impact on the way humans interact with sound. Acousmatic dislocations imply unprecedented ruptures between the source of a given sound and the outcome that ultimately reaches the listener. Such first dislocation was caused by telephony technologies, allowing sound displacement in space. The second dislocation is a temporal one; recording technologies allowed sounds to be played back after its original emission. The development of sound synthesis established the third acousmatic dislocation, of mechanical causality.

2.4.4 Site-specificity

The pieces in this portfolio are all, in one way or another, related to a specific place. But can they be designated site-specific works? If so, to what extent? To examine how each piece might relate to particular places I will make use of a couple of theoretical resources. The first is Melchionne's set of qualities often present in various site-specific practices, highlighted as critical observations. Or, according to him:

> "(…) a list, a critical repertoire, of ways in which site-specificity has been or could be conceived. (…) a tool with which critics can clarify the site-specific qualities of works as well as build positions advocating for certain qualities over others" (1997, p. 39).

Melchionne acknowledges that such list:

> "(…) does not provide us with necessary and sufficient conditions for site-specificity. Instead, it suggests a rich array of critical questions that can be raised in all sorts of contexts where site-specificity seems important" (1997, p. 41).

From Melchionne's original list, I have selected a few site-specific qualities that are relevant to the present portfolio:

> **Site-adjusted**. The artist takes into consideration the dimensions of the place in determining the scale of her work. However, the work is primarily determined by its place in the artist's own development. (…) **Formal**. The work echoes or engages the formal structure of its site. (…) **Indexical**. The work points to or marks its own location. (…) **Functional or situational**. The artist takes into consideration the use of the place, how people move through or rest in it or why they are there. (…) **Historical-Political**. The artist seeks to respond to, evoke or recover the history or political meaning of a place. (…) **Phenomenological**. The artist seeks to exploit or enhance the inherent aesthetic qualities of the place as built space, landscape, or even weather, rather than to place sometlling in the place as a point of focus (Ibid., p. 40-41).

In addition, I will consider a continuum (Figure 2) that organises various practices according to their specific relationships to place, going from non-site-specific to strongly site specific. This continuum was adapted from the one presented by

Fiona Wilkie (2004, p. 54) and originally "(…) proposed by company member Stephen Hodge during a presentation given by Wrights & Sites at the *Performance of Place conference*, University of Birmingham, May 2001" (Ibid., p. 71).

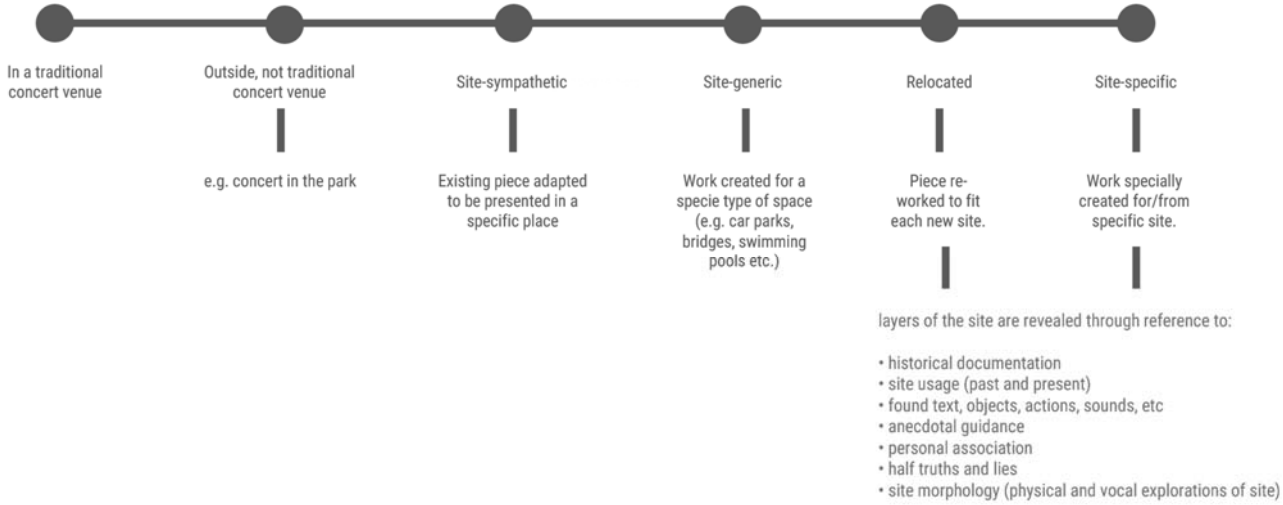

Figure 2: Site-specificity continuum, adapted from Wilkie (2004).

Wilkie's text (2004) discusses mainly theatre practices, but there is nothing that would prevent an adaptation to the artistic context of the present research. Her observations regarding the aforementioned continuum (Ibid., p. 54) were also helpful and led me to include the category of "relocated" works, placed between site-sympathetic and site-specific.

The use of such tools in the research does not aim to fit the pieces into categories, but to complement their description and the analysis of their individual relationships with space and place.

2.5 Summary

This chapter presented a number of key ideas and concepts that are used, in different ways, throughout this thesis. In section 2.1, *Open work* and *process work* are on the basis of my personal approach as composer. *Fruition* is a key term to

address the varied experiences promoted by the semi-open portfolio from a general aesthetical analysis perspective, without resorting to the use of specific labels to indicate the fruition agents involved in the process. Sub-section 2.1.4 briefly differentiated *open-form* from other notions of form in music and commented on how such open perspective is understood in this work.

Section 2.2 commented on listening perspectives, especially regarding environmental sound, aiming to situate the referential perspective of the portfolio.

In section 2.3, I clarified the reason for choosing to use the term *environmental sound* over *soundscape*; presented some relevant information regarding soundwalking; and commented on how the embedded spatial qualities of environmental sound can influence perception, dislocating the attention from "what"/"when" to "where".

The section on *space* (2.4) introduced a number of concepts used here for both compositional and analytical purposes. Its first subsection, 2.5.1, presented the idea of works as micro-universes, spaces to be understood/decoded and in which one tries to situate oneself. Subsection 2.5.2 addressed the concepts of *composition* and *listening spaces* (useful notions when considering the development and the presentation of works). The concepts of *personal sonic space* and *space frames* were also presented to be used as theoretical tools to discuss the portfolio.

3 PORTFOLIO PIECES

3.1 No Chords Attached

3.1.1 Introduction

Developed by Diogo Alvim, Eduardo Patricio, Pedro Rebelo and Rui Chaves, *No Chords Attached* "(…) is a site-specific piece that explores the physical, temporal and poetic strategies between two mobile remote performers and a pianist in a

more conventional performance space (Chaves 2013, p. 35)". It proposes a non-conventional performance situation combining soundwalk with instrumental music and it is based on a feedback system that enables sonic relocations and superimpositions between contrasting physical spaces.

The piece is to be performed, simultaneously, in a traditional concert venue (e.g. theatre or auditorium) and in a remote location, outside on the streets. Its performance requires, at least, four participants: a piano player, a spatialisation performer and two soundwalkers. The last two participants start the performance outside on the streets, walking towards the concert venue. The sound from the piano is broadcasted to a mobile speaker being carried by one of the walkers and the soundwalk audio is sent to the concert room. In the final section of the performance, both soundwalk artists reach the concert venue and join the pianist on stage.

3.1.2 Concept

Some ideas developed in *No Chords Attached* derive from elements of a piece called *Games Arcade*, previously realised by the *Unlikely Places* ensemble[14]. *Games arcade*, presented in two events in 2012 - Network Music festival in Birmingham[15] (England) and at the ICMC conference[16] in Ljubljana (Slovenia), revolved around a carefully planned soundwalk inside a games arcade. One soundwalker would go from room to room, passing by or using specific game machines to create a fragmented trajectory of contrasting physical and virtual spaces, respectively, the rooms of the games arcade and the artificially composed sonic spaces of the video games themselves. The soundwalk was streamed live to a concert venue and split into 6 individual channels. Three other members of the group were in the concert

[14] Diogo Alvim, Eduardo Patrício and Rui Chaves.

[15] http://networkmusicfestival.org/nmf2012/programme/performances/unlikely-places/.

[16] http://icmc2012.si/files/Kino_Siska.pdf.

venue. Two of them would make personal sonic commentaries by applying various real-time sound processing and playing back short fragments of pre-recorded sounds to reinforce the context of the individual game being played at a given moment. The third one would control the spatialisation of the sounds in an 8 channel PA system.

While *Games Arcade* aimed to explore the contrast between physical and virtual spaces relocated to a traditional concert scenario, *No Chords Attached* explored the contrast between a number of physical spaces and a networked space established by the continuous feedback between the piano in the concert venue and the environmental sound revealed by the soundwalker. This configuration is meant to create a constant articulation between spaces, re-combining the sonic elements to create a resulting aural space in constant flux.

Considering that this piece has a considerably complex technical configuration, it is necessary to briefly explain its basic setup. *No Chords Attached* has two main sound sources, the piano (in the concert venue) and the environmental sounds (captured by the soundwalker). There is a constant two way broadcast system in place, the piano sound is sent to the 2nd soundwalker, who receives it through a mobile phone streaming application; the environmental sounds are broadcasted by the 1st soundwalker to the concert venue, through a mobile application[17]. The piano sounds are played back through a portable speaker carried and controlled by the 2nd soundwalker. The walk sounds are played back in the concert venue through 2 transducers placed on the piano strings and through a quadraphonic PA system. The sound projected from the portable speaker can be directed at the 1st soundwalker's microphone thus returning to the concert venue and establishing a feedback loop (Figure 3). A visual component, a projection screen placed on stage, displays pictures and text messages, sent by the 2nd soundwalker, as real-time commentaries on the soundwalk.

[17] 'Liveshout' for iOS (http://www.somasa.qub.ac.uk/~liveshout/)

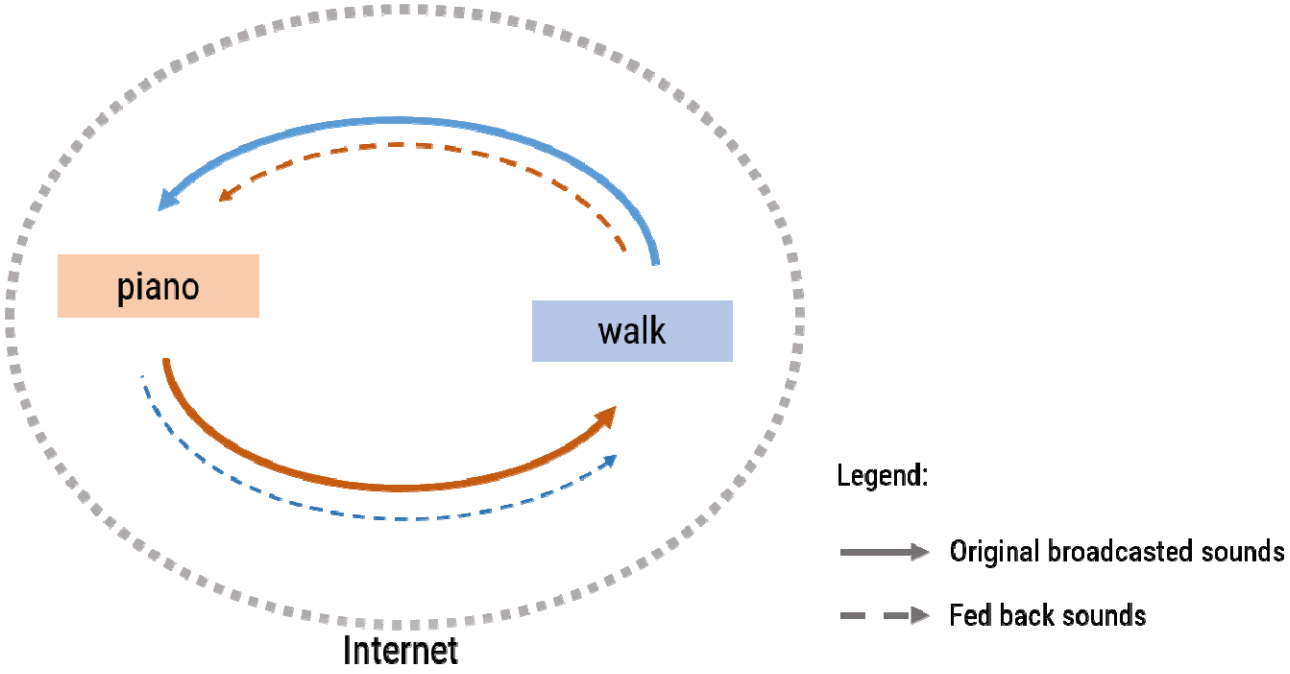

Figure 3: Schematic representation of the feedback loop.

3.1.3 Realisation

In the initial development stages of the piece, many experimental tests were made to investigate the feedback possibilities between piano and environmental sounds over an Internet connection. This experimental stage was fundamental for the development of the work for it allowed us (the *Unlikely Places* ensemble) to observe timbral interactions, how the acoustic imprints of both places blended; how gestural and textural elements behaved through the network with its inevitable latencies; and how different environmental sounds from open and closed spaces sounded through the piano transported to a concert room. In addition, we were able to check technical details such as optimal positioning of the transducers on the piano strings, mobile applications options and the stability of 3G signal during the soundwalks.

Figure 4: Test session; Chaves walking and transducers on piano strings.

In a way, the tests also represented a pre-performance stage for it allowed an exploration of creative possibilities of a soundwalk situation aiming to capture contrasting environmental sonic images.

During the composition stage, we worked on directives to structure the soundwalk basic guidelines, the piano part and the spatialisation strategies to allow those two elements to be articulated as desired during the performance. From this general plan we arrived at an overall structure with some key developments points, which establish sense of direction, contrast between sections and a build-up scenario that leads to the conclusion of the piece. The details between key points, the elements that are supposed to "bring the piece to life" are determined by the soundwalk specific route plan (dependant on the chosen performance location) and the soundwalk itself. So, ultimately, there are three structuring levels: (1) the general score; (2) the site-specific soundwalk plan and (3) the live performance walk with all its unpredictable elements and improvised decisions.

The general score (Figure 5) is organised in 4 sections and it contains 6 parts that, respectively refer to: piano; transducers level; front speakers level; back speakers level; 1st and 2nd soundwalker actions.

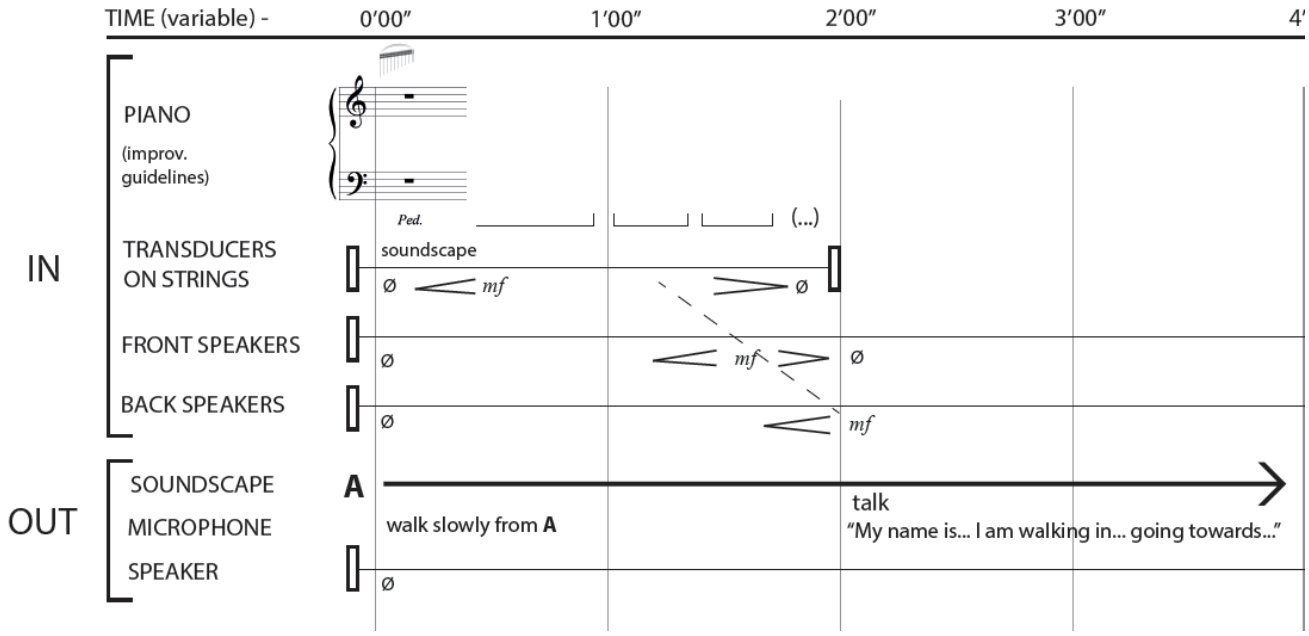

Figure 5: Score excerpt of Section 1 of No Chords Attached.

3.1.4 Presentation

No chords Attached was presented by the *Unlikely Places* ensemble at the International Computer Music Conference (ICMC 2012) in Ljubljana/Slovenia. Five people were involved in the performance itself: Pedro Rebelo (Piano, on stage), Rui Chaves (1st soundwalker), Diogo Alvim (2nd soundwalker), Robin Renwick (network, remote communication and video projection control) and myself (spatialisation and remote sound routing).

The local sound level control and spatialisation scheme included Španski Borci's[18] PA system (comprised of 4 speakers placed around the audience) and 2 small transducers placed inside the piano. In addition, one stereo audio signal was being sent to the soundwalk artist location and one another mono audio signal (soundwalk) was being received at the venue.

[18] Španski borci is a cultural centre that hosts and promotes artistic and educational events related to music, theatre and dance (http://www.spanskiborci.si/).

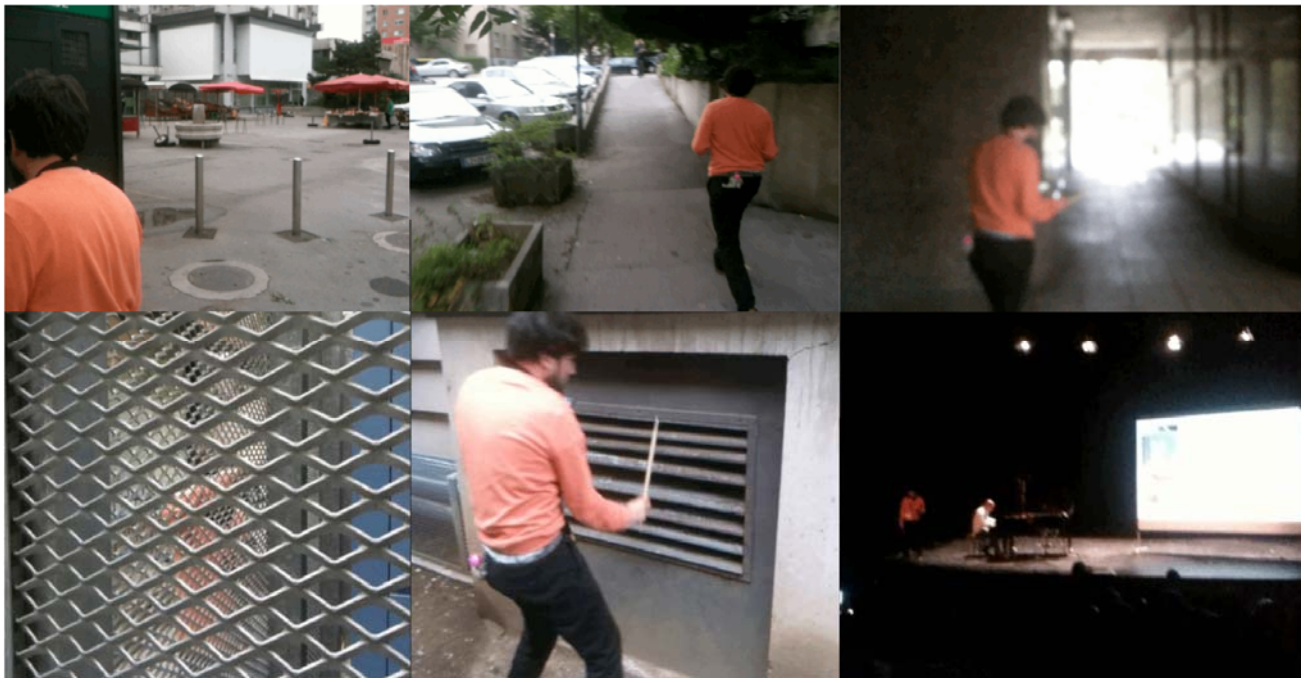

Figure 6: In Ljubljana: Chaves (walker) and Rebelo (piano).

3.1.5 Discussion

No chords attached presents an experimental, non-traditional performance format and a rather complex configuration. One of the main challenges in its development was to make sure that this complexity worked in a positive way, toward a rich fruition space instead of creating a non-engaging and excessively hermetic artistic experience. To accomplish that, we needed to make sure the elements presented, sonic and otherwise, were linked together in a coherent structure. Here is where my main contribution[19] to this particular work is found. Since it became clear we were developing something complex, I have stressed the need to organise the overlapping spaces (e.g. concert room and remote locations) in a structure with a more or less clear sense of direction, integrating the sound development and the spatialisation strategies throughout the piece. With that in mind, during our collective work, I focused on the articulation of sonic elements, proportion of

[19] As was pointed out in the introductory chapter, it is not easy to delimitate our individual collaborations in the collectively developed pieces, as the incremental decisions and results are the result of joint discussions and practice.

sections, spatialisation images and other technical details relevant to the construction of a narrative of overlapping spaces.

No Chords Attached has a site-specificity component and could perhaps be called a site-sensitive piece. It is thought for a particular kind of space, but not for a specific location. That is, the piece was composed for a scenario that combines urban surroundings and a concert venue, which could be, in theory, in any city, anywhere. In addition, its performance components happen in two dislocated spaces: (a) the open space in which the walk stablish *formal* and *phenomenological* (Melchionne 1997) links and (b) the concert venue that represent a more neutral place. The work also requires extra compositional work depending on where it is presented. Each iteration of the work needs to be restructured to fit the new scenario, it requires some adaptation for each chosen location. According to Chaves, *No Chord Attached* is:

> (…) a work that [changes] according to the city it [is] played in; triggered by the presence of a different soundscape, a different language being spoken, a different space being performed (2013, p. 193).

Having the soundwalk as its main structuring element, the piece is developed around its planned and improvised possibilities. In section 1, the opening gesture from the pianist (0'52"[20]) works as a way to introduce the outside environment into the concert room. But it does not work as a simple trigger or a switch. Since the environmental sounds are introduced immediately after that initial gesture, emanating from the piano and blended with its decaying sound, a connection of causality and timbre is established; as if the piano sound had morphed into the sound of the world outside. The walk sounds slowly "move" through the audience as they are redirected from the piano transducers to the rear speakers (2'50"), passing through the front ones. After a 'gap' between remote location and stage is established by keeping the walk sounds only on the rear speakers, the 1st walker

[20] The time references in this description refer to the documentation video that can be found in the accompanying USB flash drive.

introduces himself, describes the surroundings and announces, "I am walking towards you". This initial commentary is meant to, openly, make the audience aware of his remote presence and of his general exploratory disposition. It also functions as an indication of the possible structure of the piece, by revealing a walk with a direction, "towards you". At this point,

> "(...) images and texts start to appear on the screen [sent by the 2nd walker] and the interplay between all these elements focuses on presenting a fragmented version of space - incomplete and mediated (Chaves 2013, p. 191)".

In Section 2, through a narrow passage, the walkers reach a courtyard, an enclosed space that enhances sound reflection. The 2nd walker then introduces the feedback strategy by pointing the portable speaker at the 1st walker's microphone at variable distances, thus revealing a sonic space formed by/on the network. The pianist, in its turn, tries to react to the impressions of the remote space. Before the end of section 2 (7'10"), the 2nd walker temporarily shuts the speaker down to reset the feedback loop and the pianist starts a series of sharp cluster attacks, listening back to the piano sound returning from the remote location, observing the network latency duration and playing with the delayed pulses. In the first part of section 3 (8'50"), the walk toward the concert venue is resumed, its sound returns to the piano transducers. On a second moment, the remote sound moves to front and rear speakers and the 1st walker starts to activate the environment around him with a drumstick (9'30"). That triggers a more active action from the pianist, the 2nd walker varies the feedback control and the spatialisation also has its moment of improvisation. In section 4, the final one, after the rhythms from section 3 become sparser and fade out, the 1st walker joins the pianist on stage, facing the audience. This action confirms the statement at the beginning of the peace, silently saying, "yes, I was walking outside, moving towards this place and now I'm here". The 2nd walker shortly reaches the stage and stands there to confirm his presence. He also takes a picture of the audience and sends it through the network as he had done during the entire performance. But this time, the audience, by seeing themselves

projected onto the white screen on stage, has one more glimpse of the work's dynamic. After a minute (12'55"), the 1st walker starts close capturing the piano, intensifying the abstract, focused feedback. The 2nd walker leaves the stage to walk through the audience, carrying the portable speaker, displacing in the room a sonic texture that is the result of a complex residual feedback formed through the Internet and now materialised in an almost unified space.

Through this overview of the performance, it is possible to note that *No Chords Attached* deals with dislocations (or relocations) of physical spaces through the Internet to form a resulting complex and fragmented aural space interlaced with the network. The interplay between those spaces result in a morphing fruition space, as the perceptual horizon expands from the pianist and the stage to the whole room and beyond. The *personal sonic space* of the fruition agents is extended by the inclusion of sounds from non-adjacent locations. Even after the basic elements have been presented, the changes in focus articulated by the performers and the spatialisation, constantly reshape the aural horizons and, consequently, have an impact on the imagined spaces that characterises the individual fruition experiences.

In the context of sound diffusion in performances that combine pre-recorded electroacoustic and live instrumental parts, music Emmerson suggests that:

> The fixity of any additional live performers (…) has often been seen as a 'problem'. The instrument is rooted to a single location, visual aspects reinforce sound to locate the live source to firmly 'on the stage' while the electroacoustic sound can defy gravity and fly anywhere. One possible solution is to play with this dichotomy by considering the live element as fundamentally 'local' (2007, p. 96).

A similar scenario occurs in *No Chords attached* as the pianist is physically present on stage and the sound of the piano has a clear directional presence, while the environmental sounds of the walk have a much more diffuse quality. But there are some fundamental differences. The environmental sound, even with its remote

broad spatiality relocated to the concert venue, is also a live component and it is partially represented on stage by the images and text projected. In addition, our compositional approach does not aim to explore the initial split between both sound sources. On the contrary, the embryonic poetic idea of *No Chords Attached* is to introduce the walk as a local component, emerging from the stage, from the resonance of the piano. And as the piece progresses, piano and walk move and occupy different spaces, projecting themselves to the foreground action or retracting to the common background created by the feedback system.

This dynamic scenario configures constant changes in *local* and *field functions* (Emmerson 2007); the actions of the pianist, at first, work as *local*, directly connected to the sonic outcome, but once this same sound material returns delayed, filtered and coloured by the network and remote spaces, those local functions acquire an ambiguous and fragmented perspective. On the other hand, the 1st walker contributes to extend the aural landscape by introducing environmental sounds that carry acoustic imprints other than the ones of the concert hall. He directs our attention to a remote presence closely connected to local events, as the thread that conducts the macro performance scenario. Nevertheless, the walk actions do not work as clear local functions since the walkers' presence is felt, but his actions are intentionally fragmented and displaced in varied degrees throughout the performance. Many elements of the piece (e.g. the voice, the sounds heard and the pictures and text messages) refer back to the walk and the walkers, in order to reinforce their presence as live performers. As Hickmann suggests "Presence […] is strongly tied to command of attention – a resource that is available to all forms of performance, live or recorded, networked or co-located (2013, p. 48)".

In fact, the acknowledgement of the walkers as live performers can have great impact on the fruition experience. Informally talking to attendees after the performance in Ljubljana, I realised that some of them did not notice, at first, that the soundwalk was a live performance. That means that, part of the audience, who recognised the liveness of the walk, was following the trajectory of the walkers and

the dialogue with the pianist, possibly trying to anticipate what the phrase "I am walking towards you" could mean; while others, considering the walk as a fixed, pre-composed element of the work, had to, at some point, reorganise their perception and their own fruition experience when realising the walk had actually been a live component and, as such, adding an unpredictability factor to the performance. This 'now-ness' created by the acknowledgement of the remote live performance can be reinforced by the idea of the network as medium in which sound propagates, much like in Chafe's following observation:

> (…) just like in air, sound waves traveling between hosts on the Internet can bounce off edges, boundaries and obstacles. These reflections give rise to a configurable sound world of rooms with enclosing walls that contain networked and network objects which vibrate and produce sound (2009, p. 414).

In *No Chords Attached*, this medium combines the last minute performance decisions and the unpredictability of environmental sounds with:

> Network Artefacts such as jitter and latency [, which] often add a meta-fictional quality to the work, breaking the fourth wall and presenting the audience with stark evidence of the transient nature of the event (Hickmann 2013, p. 48).

In summary, the piece's spatial structure and the interaction of those 3 components - physical, network and subjective, form a rather complex outcome. And while this is expected, intended and meant to work positively to enable a richer fruition experience, it is also our concern not to create a too hermetic experience. To that end the piece was structured and populated with fragmented clues to help the audience wayfind its way through the fruition space.

3.2 Come Across

3.2.1 Introduction

Come Across is a soundwalk based performance. The work presents a listening focused preparation strategy that involves multiple simultaneous soundwalks, mapping, audio and video recording. Such preparation stage leads to a concert performance that re-enacts the soundwalks through drawings on a map in an exercise of listening and reminiscing.
The work was developed collectively by Diogo Alvim, Eduardo Patricio and Rui Chaves (*Unlikely Places* ensemble).

3.2.2 Concept

Like other works done by *Unlikely Places*, *Come Across* was developed to explore possibilities in non-traditional performance scenarios. Its concept comes from the desire to revisit and expand a number of ideas found in our previous works (*Games Arcade* and *No Chords Attached*), such as the use semi-open formal structures; sound mapping; relocation of soundwalks; the exploration of contrasting sonic spaces and dislocation of performance.

In *Games Arcade*, we explored the contrast between virtual (the video games) and physical spaces (the games arcade and the concert room); in *No Chords Attached* we brought together a number of spaces to the concert hall and vice-versa, establishing a feedback loop through the Internet. For *Come across* we confronted three concurrent physical spaces by overlapping three soundwalks presented in a concert situation and brought together by a visual representation (a map) that also functioned as a means to reveal to the audience part of the process and the simultaneous character of the walks.

The preliminary concept consisted of a performance scenario that would accommodate multiple simultaneous soundwalks realised in a limited urban area. After months of discussion, planning, walking and conducting listening tests, we arrived at a more detailed proposal for a collaborative process of exploration and confrontation of individual readings of a given urban sonic environment.

Such process can be divided in three stages. (1) The participants survey an urban area in search for sonically interesting elements in order to define three different walking routes with branching points. These routes have separate starting locations, two possible crossing/overlapping points between each other and a common meeting point at the end. (2) In possession of the walks plan, the performers coordinate to do the walks simultaneously; each walker registers the process through audio and video recordings - each walker chooses a different, constant angle for the video capturing. At each branching point of their own walk plans, the walkers stop and flip a coin to decide going left or right. (3) In a concert situation, the soundwalks are played back through a 3-way multi-channel system, while the video footage, edited into a single video file (Figure 7), is projected onto a screen. The walkers are present on stage and individually listen to their own audio recordings, remembering the places they passed by in order to re-enact the walks by drawing each route on a single paper map. The map (Figure 8) and the drawing performance is also projected onto a screen on stage. The concert stage, as the culmination of the larger proposed process, presents a fragmented reading of place by bringing together collected audio recording and visual cues.

Figure 7: Snapshot of Come Across' composite video.

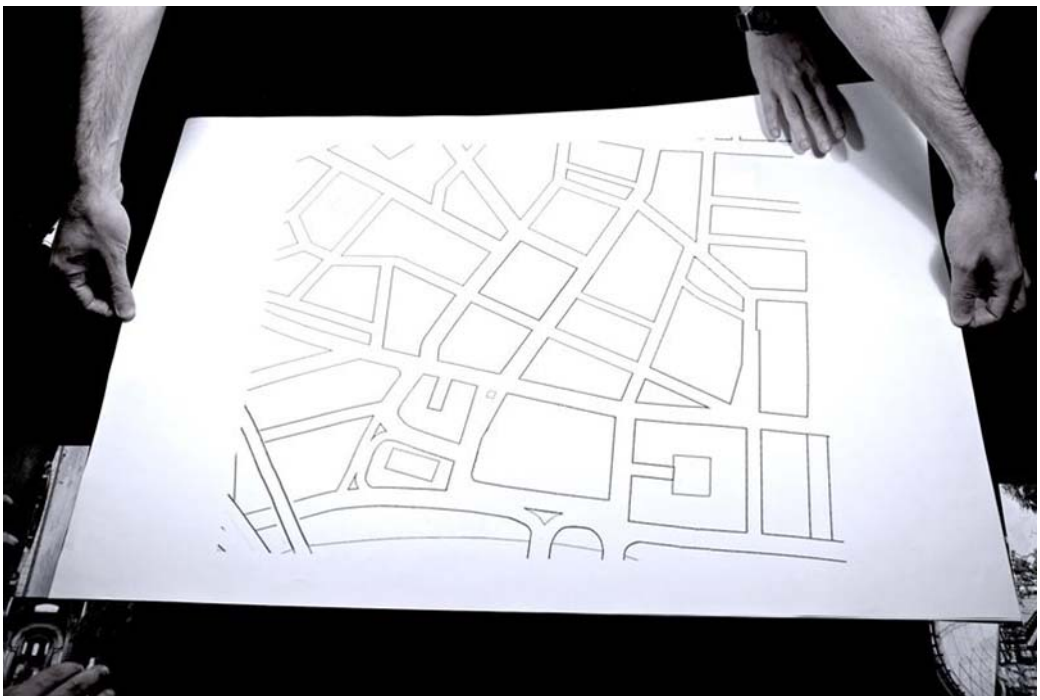

Figure 8: Map used during Sonorities Festival in Belfast (2013).

Keeping in mind the nature of our collaborative work pointed out in the introductory chapter, it can be said I was particularly interested in elaborating a performance experience that included indeterminacy elements in its structural planning, possibly exploring gameplay inspired strategies. These were some of the embryonic elements that are on the base of the piece. I wanted this piece to be an opportunity to confront our multiple views and choices as recordists in a 'common ground' that could be recognized as a shared space by the audience during the concert stage.

3.2.3 Realisation

As the previous subsection indicated, similarly to *No Chords Attached*, the detailed structural elements, performance strategies and the resulting format were progressively developed through testing and group discussions.

One of the first steps we took during the development period was to do a series of surveys in the city centre of Belfast in search of interesting sounds found in specific locations. Once we had chosen a few locations, we tried to devise three different walk routes. The next step was to do a series of soundwalks to assess how well the routes worked in combination with each other, considering distance, walking pace and average time taken to complete the walks. We were observing the possibilities of the routes to cross each other, considering different combinations of choices made at the branching points, and trying out various strategies for microphone placement in order to get clear recordings without excessive noise from the walker's body movements or unwanted external noises (e.g. wind gusts).

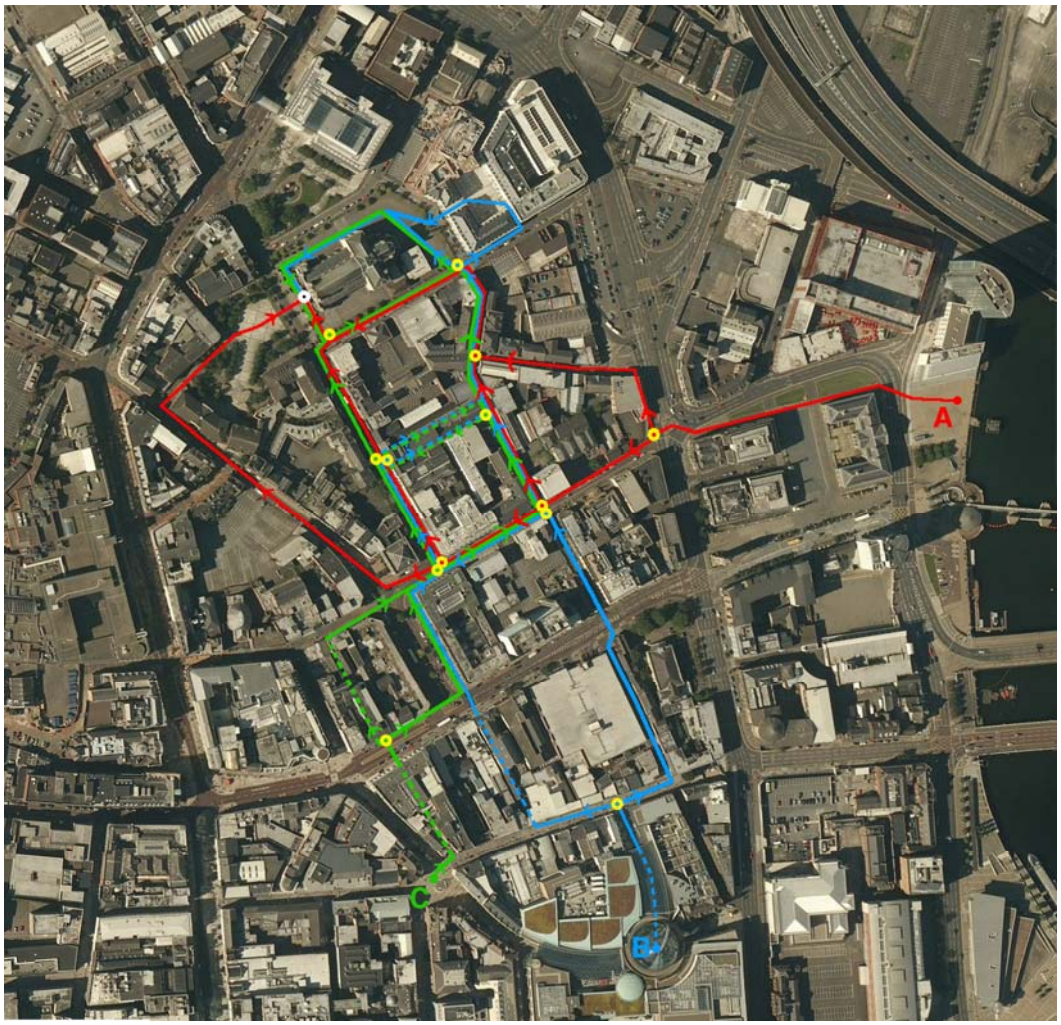

Figure 9: Example of branching routes map for *Come Across* (Belfast city centre).

The initial tests revealed problems related to the walk plans: even if all the routes had roughly the same distance, the time necessary to complete the walks could greatly differ depending on details such as car traffic, steep terrain or the average pace of the walker. It became clear that to arrive at a suitable scheme, we would have to communicate details of our personal experiences as walkers to continuously re-work the routes design. In total, we tested about a dozen route combinations during several, not consecutive, days; many recordings were made to allow tracking of time and further analysis and discussion about audio and video content.

The recording of simultaneous soundwalks was quite challenging at times for there were many unpredictable factors that could compromise the process, such as (a) sudden loud noises, causing clipping distortions; (b) great difference in pace

between walkers, leading to uneven durations; (c) assorted technical problems (e.g. battery failure, mobile application malfunction etc.) and (d) weather conditions. In such cases, since we had no way to communicate during the process (mobile phones were kept in airplane mode to avoid interference), we would meet at the final location and start all over again. The numerous rehearsals and attempts only made the process more interesting as we got to know our routes characteristics in greater detail, forming a kind of "bond" with the places explored.

After we had all the performance material ready for the concert stage, and since we wanted *Come Across* to be a performative process that could be redone other times in different locations, we wrote a set of guidelines that summarise the necessary realisation steps.

3.2.4 Presentations

In 2012, in 10-minute long a poster session that was part of *Global Composition Conference* in Darmstadt, Germany, we talked about *Come Across'* general concept and presented a short video documentation with excerpts of a rehearsal realised in the Sonic Lab at the Sonic Arts Research Centre (Belfast). This was a good opportunity to evaluate other people's response to the work's proposal and it helped us to format the version used in later performances.

In 2013, we (*Unlikely Places*) performed the piece during the Sonorities Festival[21] in Belfast. Later the same year, in Lisbon, as part of Echoes#2[22] programme, the Unlikely Places Ensemble realised a related four-day workshop (from 19 to 22 September). On the first day, in an informal lecture format, we introduced the project and a few key concepts, such as environmental sound, soundwalking,

[21] http://www.qub.ac.uk/sonorities/old/2013/programme.html.

[22] Echoes is a program for the city of Lisbon that aims to put together thoughts, experiences and interventions on the relationship between LISTENING and PLACE (2013).

mapping, aural architecture and open poetics. On the same day we took the group on a silent soundwalk through an adjacent neighbourhood; an informal discussion about the experience followed. Day two was mainly dedicated to define routes, plan and design the walk maps. There were 5 participants, divided in two groups. On the third day, they performed the planned simultaneous walks, registering audio and video. Later, on the same day, the performance material (e.g. map, audio and video) was edited and organised.

Figure 10: Workshop participant recording at Alfama district in Lisbon.

The final day was reserved for sound check and the performance of both groups in an evening concert. Each group presented its own version/realisation of *Come Across*.

Figure 11: Workshop participants performing Come Across.

3.2.5 Discussion

Come Across' openness quality comes from a number of different characteristics: (1) the inherent unpredictability of environmental sounds; (2) the walk plans, which are dependent on the performers/co-authors choices; (3) the chance operations to decide which direction to follow on branching points; (4) the complex and fragmented content presented in the concert event.

In No Chords Attached, the planned soundwalk remotely conducts the interaction with the other performance elements in play. In *Come Across*, the structure derives from the network established by the potential walk routes, sharing similarities, but retaining their own separate developments. The general sonic material, the piece duration and overall dynamic is determined by the designed map. The urban setting is the stage that articulates the merging of individual *sonospheres* that occasionally overlap.

The collective design of the map, based on a repeated practice of soundwalking is a central component of the work. Not only because the map organises the central structural component (the network of walks), but because the necessary steps for

its making, including the repeated soundwalks themselves, might allow the forging of stronger relationships with the places involved.

> Places reveal different aspects of their sonic life through time: if soundwalks are repeated daily, weekly, day and night, through seasons, over years perhaps, and with attention, much becomes apparent that evades the initial experience or recording (McCartney 2012, p. 3).

We see the repeated soundwalks, associated with the routes' design and preparation of audio and video material for the concert performance, as performance elements themselves. From that perspective, *Come Across* would have two performative moments: the interlaced walks and the concert event. It is also possible to think of the concert as a documentation product presented as performance; a way to relocate the walk performance to another context. Nevertheless, I am more interested in pointing out the ambiguity of this configuration than fitting the piece into pre-established creative categories.

Since the walks are pre-recorded and, during the concert, those performance components are dislocated in time and space, one might argue that the work's site-specificity character is minimized. As in *No Chords Attached*, the work emerges and depends on the places it is developed/presented, falling into the 'category' of *relocated* site-specific. In addition, in Melchionne's terms, *Come Across* borrow *formal* characteristics from the walks and makes use of the sounds of the referred locations as central aesthetic component - *phenomenological* quality.
Come Across requires a deeper reformulation than *No Chords Attached*, since the guidelines for designing the walks are less specific and both the content and its development are entirely dependent on the characteristics of the new location and on the choices made by the walkers involved. This means that synecdoche and asyndeton effects are strongly dependent on the route design and field recording choices. In the complex scenario of the concert presentation, when one can hear all walks at once, there are further highlight possibilities done by the written commentaries on the map. The occasional coincidence of a recognisable source of a sound showing on the video projection can also function as synecdoche effect,

even though the videos are intentionally shot not in specific ways not reveal too much causal information.

Although I have stated in the introductory chapter that *open work* and *process work* are concepts that I consider more as inspirational starting points in my practice than theoretical tools to develop and analyse the portfolio, it is interesting to point that Come Across is the work that comes closer to Aira's idea of process work as it suggests a non-traditional creative process as the 'work of art' itself, which when executed, generates unique variations or *appendice-works* (Aira 1998).

In the concert performance, all the presented elements point to the spaces where the recordings were made. The map is the main representational device as it centralizes and organises the performance actions. The edited video has a complementary function; it is one more piece of clipped information in the fragmented re-composition we propose. The sound from each walk is directed to specific channels and the spatialisation is fixed, matching the starting points of each walker in the projected map – Rui Chaves, left; Eduardo Patricio, centre; Diogo Alvim, right (Figure 12).

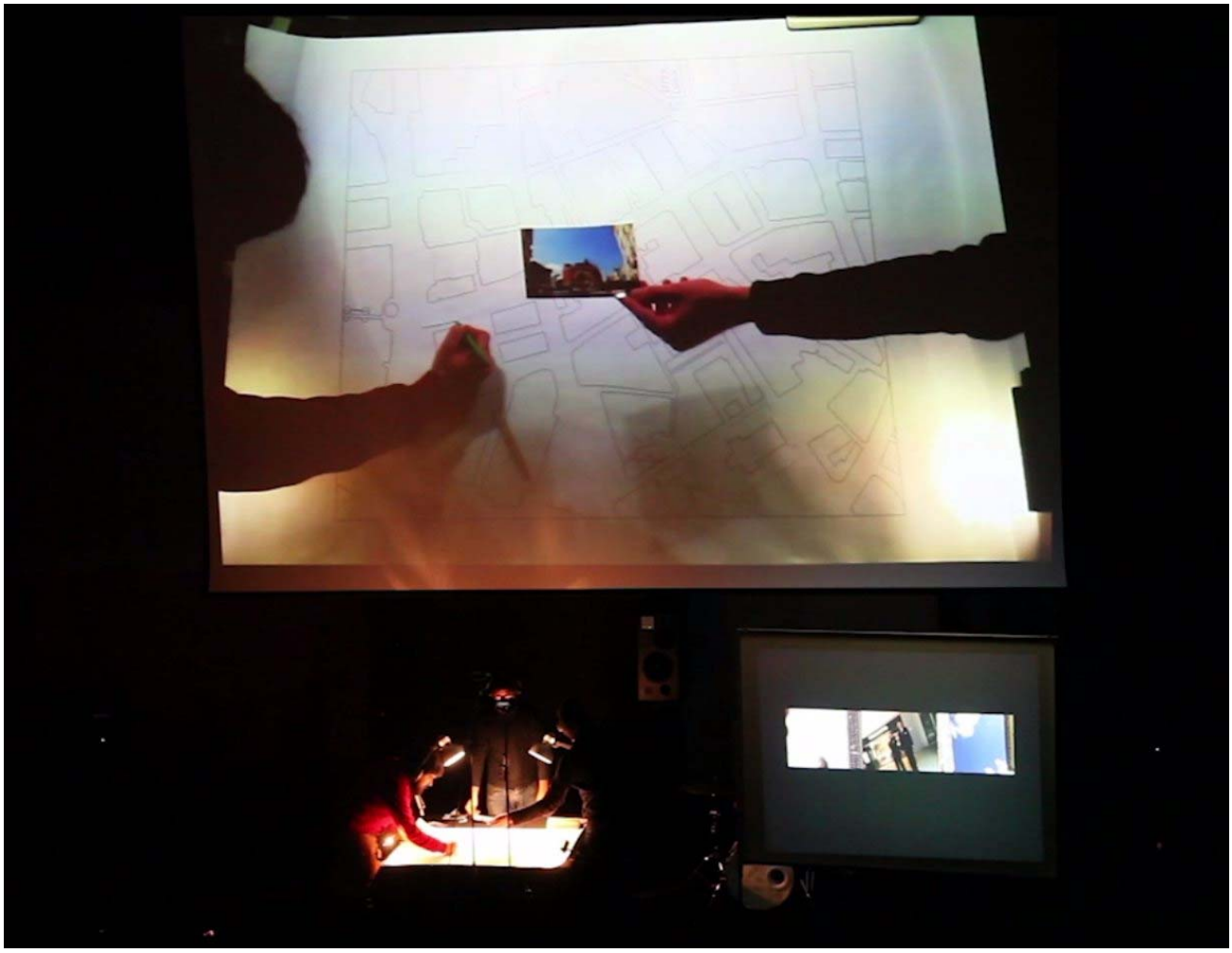

Figure 12: Come Across concert performance during Sonorities Festival 2013.

Those elements aim to set a fruition frame, by presenting an abstract combination of three separate locations and their sound feeds that occasionally merge, two at a time and eventually into one. The act of drawing and recollecting details about the individual walks is thought as a gesture of re-embodiment. Each walker claims its path to himself and tries to create an ambiguous narrative complemented by the textual commentaries and the composed video. Considering Emmerson's *space frames*, the proposed performance devices try to move the sound closer to a *stage* perspective. The created contextualisation and the eventual links between image/action and sound have the potential of stablishing ephemeral local functions dependent on the fruition agent's perception, focus and subjective association strategies.

3.3 Lock 1 memories

3.3.1 Introduction

Lock 1 memories is a GPS triggered soundwalk mobile application available for Android and iOS platforms. It presents a semi-open interactive composition based on environmental sounds designed to share the author's experience of place and trigger potential new insights on the listener about the Lagan Towpath area, around the weir near the Belfast Boat Club (Figure 13). This app-piece is part of a larger project called Belfast Soundwalks[23].

> [The project] led by Pedro Rebelo, was created by artists and researchers at Sonic Arts Research Centre (SARC) at Queen's University Belfast, in collaboration with the Institute for Collaborative Research in the Humanities and Belfast City Council. The project was funded by the Arts and Humanities Research Council's Cultural Engagement Fund in 2013. Through the development of a locative smartphone app, the project aims to engage the public in the relationship between sound and place with a focus on the city of Belfast (Rebelo and Bass 2013).

Belfast soundwalks is an 'umbrella app', which contains only information about the project, a list of soundwalks available for download and a map of Belfast with pinned locations, which indicate where each soundwalk was developed. From the main menu "soundwalks" (Figure 14), users have access to general descriptions of the soundwalks and teaser videos. Each soundwalk can be downloaded individually and, once downloaded, they are available on the main menu. "Using GPS technology, the app tracks the user's location within the city to present unique listening experiences associated with key places" (Rebelo and Bass 2013, unpaginated).

[23] http://www.belfastsoundwalks.org.

Figure 13: Lagan Towpath near Belfast Boat Club.

All artists involved have a common goal: "(…) to engage the listener in rediscovering a place through sound" (Rebelo and Bass 2013, unpaginated). Nevertheless, the included soundwalks present various strategies to achieve such goal. *Lock 1 Memories*, in particular, was conceived with emphasis on artistic creation rather than documentation. It does not intend to portrait accurately or to document the environmental sound of a particular area of Belfast.

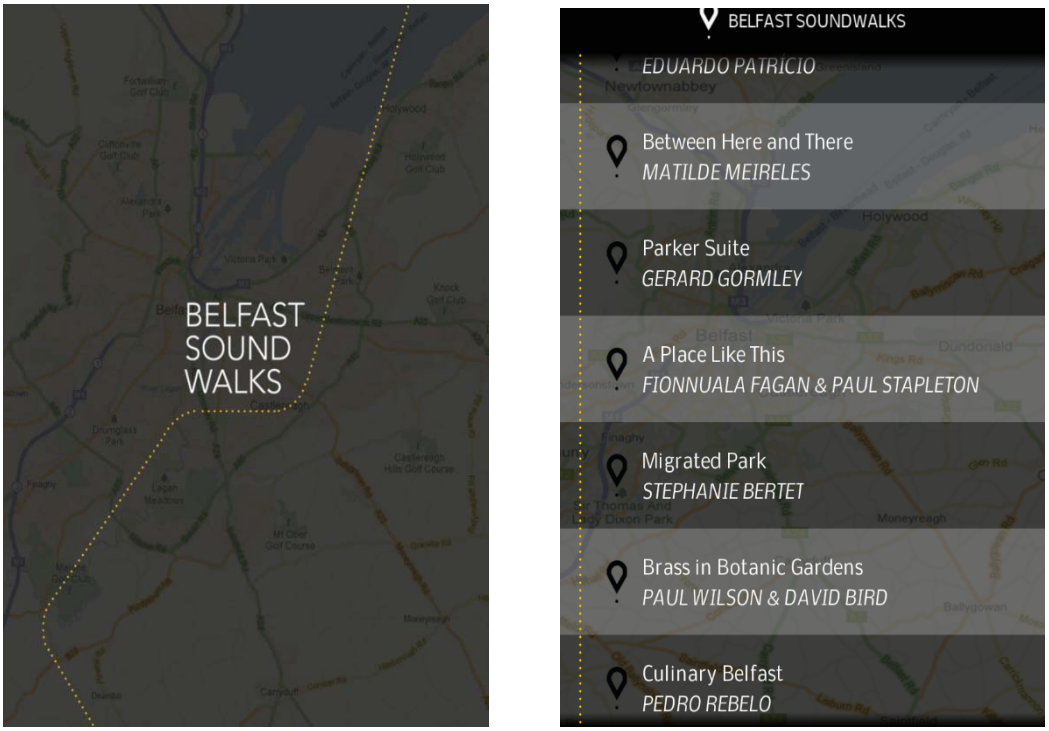

Figure 14: Belfast Soundwalks umbrella app: opening page and main menu.

The current version of the app includes soundwalks by John D'Arcy; Aidan Deery and Cormac Crawley; Isobel Anderson; Eduardo Patricio; Matilde Meireles; Gerard Gormley; Fionnuala Fagan and Paul Stapleton; Stephanie Bertet; Paul Wilson and David Bird; and Pedro Rebelo.

3.3.2 Concept

The area I chose to develop this GPS triggered soundwalk is situated around the *Lock 1*, a place "(…) known as Molly Ward's, after the 18th century tavern. It was run by Molly and her husband William, a lock-keeper." (Lagan Valley Regional Park 2013). The area is part of the Lagan Towpath, which nowadays is "(…) an unsegregated route for the use and enjoyment of pedestrians, runners, cyclists and dog walkers (…)" (Lagan Valley Regional Park 2014). This route is indeed often used for cycling, running, jogging and for short walks, but it is also used by workers and students in their everyday connections.

In acoustic terms, the rich combination of natural elements and the constant human activity in the area provide an interesting scenario. The basic sound content consists of running water sounds from the river and the weir, bird songs, wind blowing on the trees etc. In addition, especially during daytime, there is a variety of sounds from human presence: steps, bicycle rattling, voices, laughter etc. Eventual car engine and airplane sounds can be heard from the distance, but in general, the surroundings do not have a strong presence of urban sounds. I have chosen not to use the dichotomist terminology related to acoustic ecology: *low-fi* and *hi-fi* (Schafer 1994), respectively usually associated with natural and urban sounds to avoid any implied judgment of value.

The developed soundwalk aims to explore the natural and cultural richness of the towpath, bringing a collection of sonic events organised in sections or "scenes" that blend with the physical non-recorded environmental sound, superimposing several instances of the same place dislocated in time. There is an underlining metaphor of a joint walk in which myself, as the author, am constantly trying to convey memories and impressions of that particular place.

3.3.3 Realisation

A preliminary survey of the area included audio and video recordings, informal interviews with local people and a search for official information about the Lock 1 on Belfast City Council's website. On the latter, I have found out that this particular area (the Lock 1 and surroundings) is included in a major renovation plan of the River Lagan called "Lagan Gateway project", expected to be carried out by the City Council at a date yet to be determined[24]. This project, among other things, aims to re-open the river for navigation, exploring commercial and touristic possibilities.

> Stranmillis Gateway [the area surrounding Lock 1] will offer a waterfall spectacle and incorporate a fish passage and monitoring facilities. Also the elegant pedestrian bridge will create new pathways between communities in Lockview Road, Annadale and Belvoir. (…) There is the potential for a Visitor Centre at Lock 1 which would offer valuable Gateway site information and interpretation services, restaurant and restrooms and has the potential to create employment opportunities (Belfast City Council 2013)[25].

This piece of information considerably changed my perspective. Initially, my basic intent was to create an interesting soundwalk, exploring the rich environmental sound content of the area. However, since the renovation of the river as described by the City Council of Belfast would most certainly strongly alter the current landscape (Figure 15), I became inclined to include this potential future change in my work's narrative. I have decided to ask people who visit the area whether or not they had any knowledge about the Lagan Gateway Project and what was their opinion on the subject. In my informal investigation, I could not find a single person who had heard about the renovation plans.

[24] "A design team is working on the detailed plans for the Lagan Gateway project with the aim of securing planning approval in spring 2016" (Belfast City Council 2016).

[25] There is plenty of information about the project on the Belfast City Council website (http://www.belfastcity.gov.uk/business/regeneration/lagancorridor.aspx), including a Study Report and a flyover simulation video.

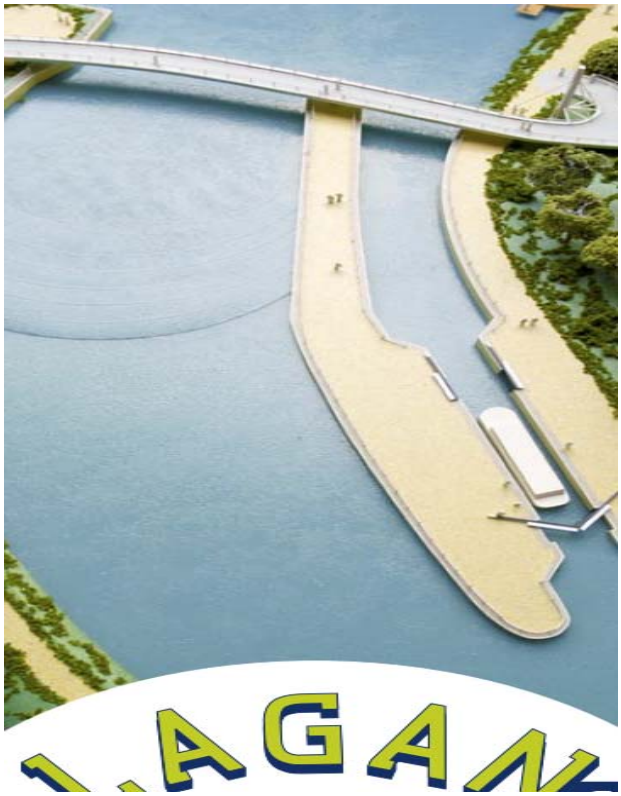

Figure 15: Cover of the brochure that presents the Lagan Gateway Project. (Belfast City Council 2013).

The initial concept of *Lock 1 memories* was to offer clues to my personal impressions of this particular acoustic-social environment. Not only would it be hard to communicate my impressions themselves, but also it was my intention not to involve the listener in a strong narrative thread. Therefore, clues should be more than enough.

That said, this soundwalk, with a combination of original and processed audio recordings, would present and highlight some features of the environment with the help of my recorded voice, which would address the walkers inviting them for a walk and make some commentaries along the way. However, after identifying that most people had no knowledge of the renovation plans for the river and surrounding areas, and considering that this is something that would quite possibly change the area in almost every possible way, I decided that this voice-character would bring news of it during the walk.

The first practical step I took toward realising the piece was to visit the area without any pre-defined strategies, but to walk around, taking pictures and

recording audio. That allowed me, if not to establish a deeper connection with the space, to listen to it in a more analytical way, looking for characteristics I would like to highlight.

After this stage, I tried to define spatial limits in terms of a possible explorable area or 'start' and 'ending' points, since I wanted the walk to have a clear sense of direction. I tried to establish what could be considered reasonable distances for people to walk and the possible longest duration for the soundwalk, since there are limitations in terms of data storage for the mobile application. At this point, I also started considering a number of formats and interaction possibilities for the walk. I have decided then that the walk would have two large "moments": (a) *going* and (b) *coming back*. This would suit my idea of having two contrasting sections and it would explore the fact that most people would probably have to go back in the direction of the city to carry on with their lives after the walk.

Having defined the main structural characteristics, I divided the area in a number of zones (Figure 16) and began to record sound material using three basic strategies:

1. Standing at the centre of each zone, I would record long takes, using a regular stereo microphone at less busy periods of the day. Such recordings would be used for the background layers in the final application;
2. At busier periods of the day, with more human activity, I would record shorter takes, using binaural microphones and slowly walking across zones. Those recordings would be used to compose the foreground "scenes";
3. In some fixed key locations, I would talk to binaural microphones placed in someone else's head to record the character's lines.

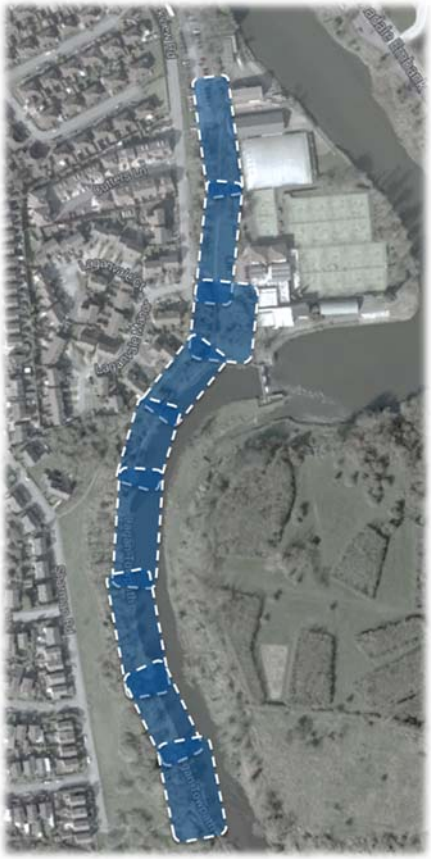

Figure 16: Basic zone mapping to organise the recording strategies.

All this material, constituting about seven hours of recording, was organised and edited to create twenty hotspots to be activated during the walk. Three channels were used in the application to reproduce the background, foreground and speech layers. Figure 17 intends to illustrate the positioning of each sonic layer along the path.

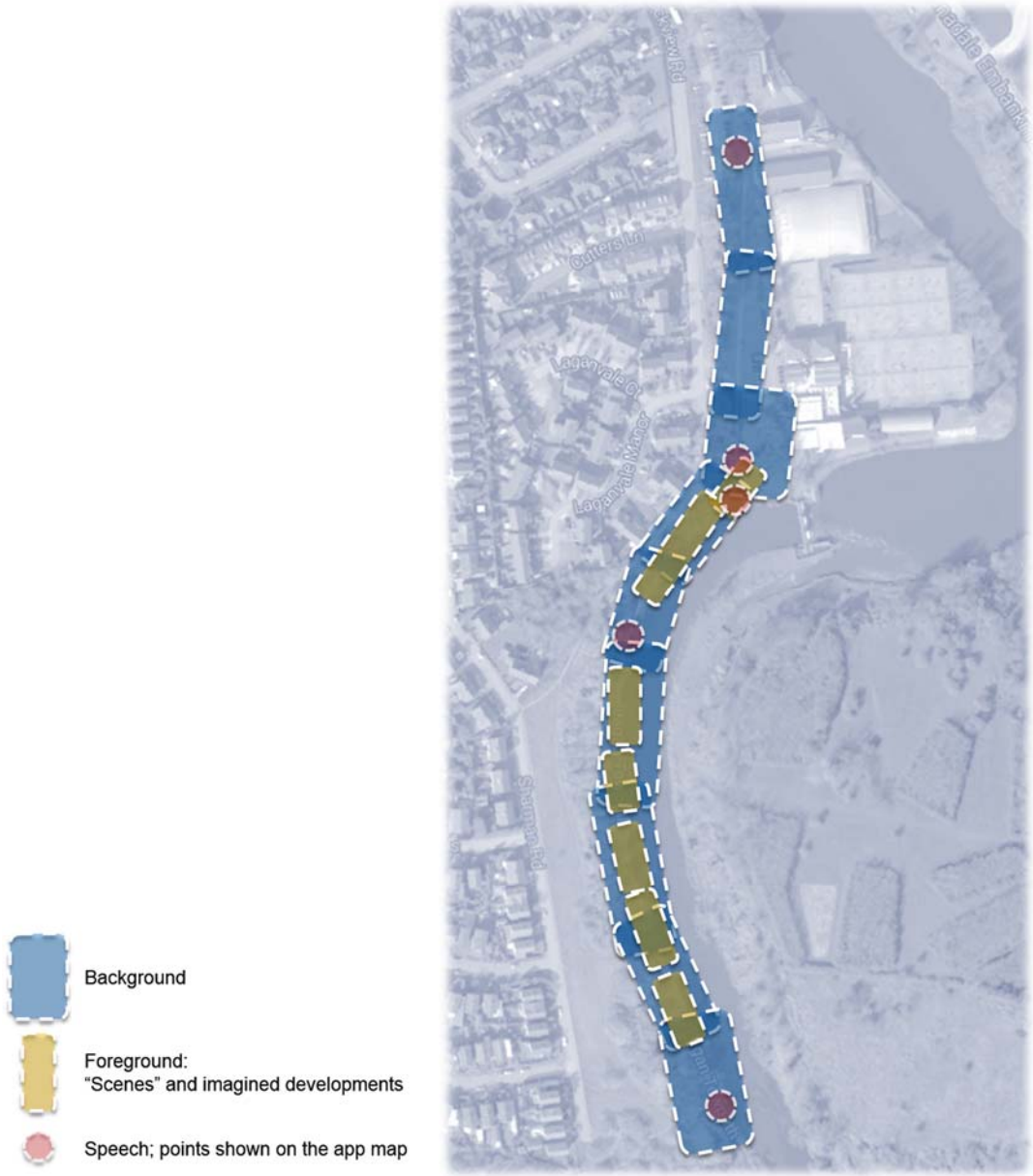

Figure 17: Arrangement of different layers of audio as hotspots used on the application.

The walk route, assuming the listener would go and come back with no detours, is about one kilometre long. The duration can vary greatly, depending on the listeners pace. The estimated time to listen to the full audio content is, roughly, between 35 and 45 minutes.

3.3.4 Discussion

The previous section presented some realisation details, which are necessary to make possible a brief discussion about specific characteristics and aims of this particular piece.

Lock 1 Memories is the piece in portfolio with stronger site-specific characteristics. The work is about a specific place, it was developed and shaped according to its characteristics and it can only be accessed in situ.

Lock 1 Memories explores physical spatial features present in the chosen area, which organise both the walking route and the sonic 'scenes' around them. That is, the chosen route and the way the scenes were organised are directly related to the extension, shape and present elements of the surroundings. One could ask, what cues does the space (or the chosen route) itself present to contribute to this sense of structure and direction? On a macro scale, clues emerge from the form established by the proportions and shape of the area and its relevant connections to the composed overlapping audio scene zones.
On a smaller scale, there are the idiosyncrasies of each segment of the route: the parking space, the paths leading to the few edifications present there, the weir, the route by the river etc. Each segment presents different spatial cues that can be associated with its human and natural activities. That is, the route itself presents an almost narrative structure.

As stated previously, the area I have chosen for this walk presents some interesting characteristics. Natural sounds, including birds, wind and running water are combined with sounds from an almost constant human presence: cyclists, runners, families going for a walk etc. This set in itself already constitutes an interesting sonic scenario, but there is an extra feature that makes it even more appealing to me: it is a transition area (Figure 18). After walking just a few hundred metres, the surrounding sounds change considerably. It goes from an area with

more urban sounds, including traffic sounds from both the residential area around and the Annadale embankment, to a quiet setting in which natural sounds are predominant. The piece tries to take advantage of this unique feature, leading the listener to a place that is, at the same time, sonically distinct and geographically close and part of the city's everyday life.

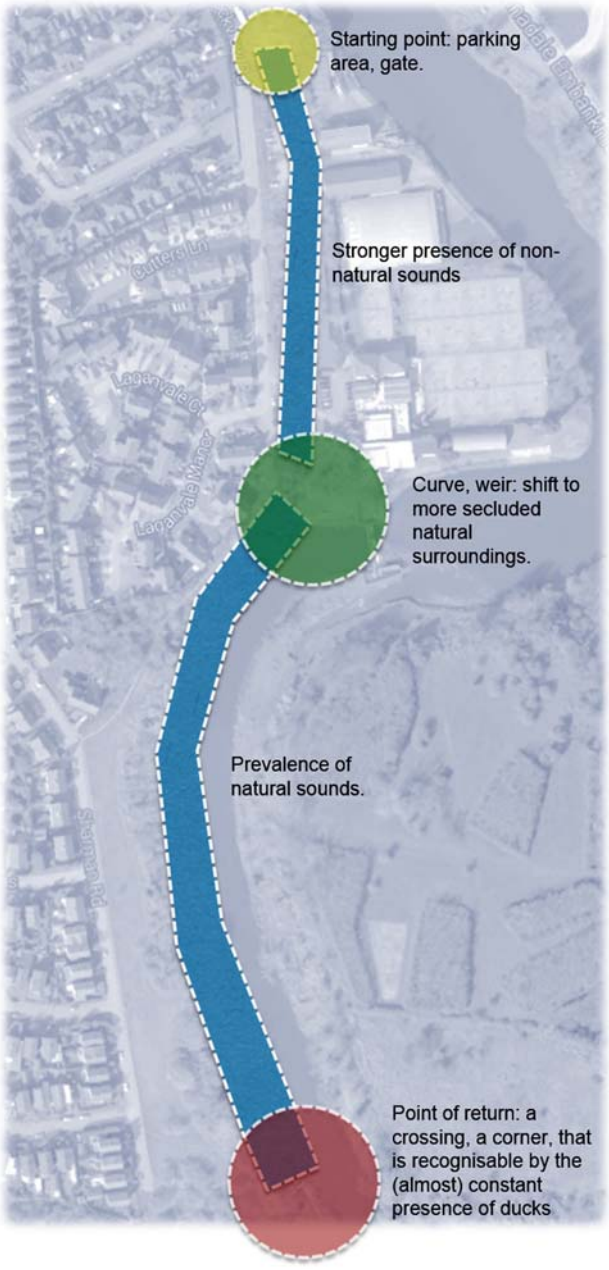

Figure 18: Main structural spatial components of the route.

This is an important aspect for me as I intend to share a personal experience that could resonate with the listener in different ways. That is, I am exploring features of a somewhat familiar space in order to create something new and to provide an opportunity for a new reading of it to be established. This project assumes that soundwalks can be a powerful way to re-experience and re-think everyday life (McCartney 2010).

It is possible to propose a number of comments on why soundwalks might have an impact on one's perception of everyday life. In the case of Lock 1 memories, I would suggest:

1. Alternative motivation. The listener is there to experience, somehow, the walk. It might be the case that the same route is part of his/her daily life, but certainly in a different manner;
2. Re-focused attention/listening. The listener knows that the purpose of the walk is to listen. The resultant listening attitude will be certainly different than that of everyday life;
3. Mediation. A technologic apparatus mediates the listening process. There is a visual interface and sound being presented through headphones;
4. New/extra content. The soundwalk offers extra layers of information (sounds, text, map), narrative elements that merge with the current soundscape around, creating a new space to be explored;
5. Potential for raising questions. The piece aims to raise questions about the place, its elements and a possible future.

One could say that *Lock 1 Memories* is somewhat similar to a 'photo album': it is potentially more engaging if the "images" resonate with the listeners and can somehow establish connections with their subjectivity. This is one of the things I expect from the piece, that any level of familiarity with the place will help to create an initial connection that should expand in different directions as the walk becomes something that goes beyond previous experiences. *Lock 1 Memories* is meant to tap into the listener's subjectivity rather than present a detached, abstract

sonic experience. Iazzetta states that "(...) the familiarity with a specific sonic context leads to a more referential perception, whilst unknown sonic contexts cause the attention to focus on acoustic details[26]" (2009, p.97). This referential perception works toward creating different pre-dispositions regarding aural elements of everyday life in combination with pre-selected and recorded material and aims to bring background sounds, that are not so noticeable for always being there, to the focus of perception. This re-focused listening helps alternative perspectives to emerge.

The fact that the walk experience is mediated by a technological apparatus also inevitably changes the listening perspective. The use of a specific set of headphones, the mobile interface and the underlining text presented through the extra sounds form a situation that differs considerably from everyday life situations. This has an impact on the listening since:

> (...) perception depends on historically established human practices that can alter the system of codes used to process incoming information and can influence the decision assigning the perceived objects to appropriate categories (Luria 1976, p. 21).

In a broad perspective, I believe sounds can have a stronger, deeper and/or more immediate impact than images on humans. Bubaris's discussion about the concepts of representation and sensation may offer some insights about this idea:

> The things that we perceive are, in essence, cognitive structures, mental images and symbolic representations formed in the mind, and therefore they are detached and abstracted from what they refer to. (…) in order to express these internal cognitive structures of thought, we necessarily need the aid of external systems of mediation, such as language, theory, and the media. However, if vision and images are the preferred expressive means of representation, hearing and sound seem to precede it. With sound and the act of listening, we feel in a more immediate fashion, our body vibrates in sympathy with the sound source (2012, p. 116).

[26] Original text in Portuguese: "[…] a familiaridade com um determinado contexto sonoro leva a uma percepção mais voltada para significados referenciais, ao passo que o desconhecimento de um contexto sonoro conduz a atenção a focalizar-se em elementos acústicos" (Iazzetta 2009, p.97).

Ingold presents a similar conception on the following passage:

> (…) the notion that sound can get inside you and shake you up, in a way that light cannot, has a long and distinguished pedigree in the history of ideas. Time and again, the ears are imagined topologically as openings in the head that actually allow the sound to seep in and touch the innermost surfaces of being. […] Sound, it is said, reaches directly into the soul, whereas in vision all one can do is reconstruct a picture of what the outside world might be like, on the basis of light-induced sensations. (2002, p. 244)

In my personal experience, that sometimes seems to be true. Sound seems to have an impact that might be connected to some instinctive layers of our perception, causing some impact on a sensation level, affecting our bodies even before the perception of the auditory phenomena is complete in our cognitive system. This possible pre-cognitive hearing could be related to the phenomenon of microperception. Bubaris (2012) presents a brief explanation of it when referring to the mechanical and electrochemical process of hearing:

> This process is, in a sense, both linear and nonlinear. It is linear because, following a cause-effect logic, it will eventually formulate a mental construction which refers back to the original stimulus. At the same time, this relation is non-linear because the sensation of the recognizable sound is not fixed due to the fact that multiple signal transmissions to neurons overlap in various ways, resulting each time in a non-determined modulation of the signal. This complex and convoluted process of hearing is neither immediate nor subject to reflective consciousness because it occurs prior and in excess to the conscious understanding of the sonic event (2012, p. 119).

The statement above could corroborate the notion of sound affecting the body in a deep, pre-cognitive level, but it also points out the fact that hearing is a complex process in itself that leads to multiple readings of the same phenomenon.

In *Lock 1 Memories*, the information content, the audio being played back, is roughly the same as one would encounter in everyday life. The mediation done by

the app is meant to complement the environment around the listener. For the most part, there is no drastic change in the sonospheres' configuration. Nevertheless, the piece brings a selection of sonic events that will not coincide with the live events during the walk. Again, synecdoche and asyndeton effects are used here to select, highlight and filter out sonic elements, creating a complementary composite sonic scenario to be applied over the current sounds around the listener. What kind of effect could those disembodied elements have on the listener? On the other hand, how would the reinforcement of an already clear 'signal' sound affect one's perception of place?

Disembodied sound on its turn, since the emitting source is not present, could affect us in different ways, by signalling our brain that something is out of place or by tapping into our self-defence instincts. The Canadian sound artist Janet Cardiff states about disembodied, rearranged sounds:

> Sound has an innate ability to transport you out of your body so if you give an audience various soundscapes you can transport them through their imagination into many different places. For example the sound of ghostly people talking around you can be startling, or the sound effects of horses going by can give you a sense of the past. I include simple but effective effects such as a fly buzzing your ear, passing musicians or a helicopter flying over to take you out of your body into different imaginary spaces (2005, unpaginated).

Lock 1 memories also intends to use carefully placed sounds that do not belong to the current environment, but could have happened in the past or could become real in the future to transport the listener's imagination to different places. Those completely disembodied sounds also aim to achieve a particular effect of disturbance. The pre-recorded and composed material is dislocated in time and it will be played back in different periods of the day, different seasons etc., contributing to form a partially unmatched sonic scenario. These temporal dislocations will cause punctual sonic events to emerge, creating a contrast

between sounds that "belong" and *schizophonic* (Schafer 1994, p. 88) or *ghostly* (Cardiff 2005, unpaginated) sounds.

I have explored unexpected ghostly sounds to take advantage of the ambiguity it can introduce, which can multiply the possible fruition ways according to the listener's subjectivity. For once, the ghostly sounds leave a gap to be filled by the listener's imagined objects/events. Carpenter and McLuhan make an observation about the impact of the contextualised sounds can have on us in opposition to visual elements:

> Preliterate man was conscious of this power of the auditory to make present the absent thing. Writing annulled this magic because it was a rival magical means of making present the absent sound. Radio restored it. In fact, in evoking the visual image, radio is sometimes more effective than sight itself. The squeaking door in Inner Sanctum was far more terrifying over radio than that same door seen and heard on television, because the visual image that sound evokes comes from the imagination (Carpenter and McLuhan 1960, p. 69).

In a similar way, Ingold, when discussing the perception of the external world through sight and hearing, states:

> Looking and listening, we receive one set of sensations through the eyes, and another, quite different set through the ears. Supposing that our knowledge is ultimately founded on sensory experience, how do we know that the sights and sounds that come to our notice are all manifestations of the same thing (…)? If we hear sounds rather than things (…), then how do I know that this sound I hear belongs to that train I see? (2002, p. 243)

What is a philosophical question to Ingold I propose as aesthetic experience in *Lock 1 Memories*. The constant subtle uncertainty of causal connection between what one can see and hear and the eventual obvious revelation of ghostly sounds should contribute to diverse fruition experiences.

By now, it should be clear that *Lock 1 Memories* relies on the mix between the live environment sound and a *mediascape*. To avoid misunderstandings, it is

necessary to determine which notion of mediascape is used here. Mediascape refers to technologically mediated experiences that "(…) are characterized by the simultaneous occupation of virtual and physical space" (Joselit 2005, p.2) or in which "(…) the user experience of walking through the physical world and triggering digital media which has been situated in that place for a particular reason by the mediascape designer" (Reid et al. 2005, unpaginated). This overlaying of physical and virtual is a recurrent strategy in Blast Theory's[27] work. One example would be 'Can you see me now?' (2001), "(…) a game of catch [, in which] Online players are chased through a virtual model of a city by 'runners' or street players, who have to traverse the actual city streets in order to capture the online players" (Benford et al. 2006, unpaginated). In this case, the mediascape is formed by the superimposition of the physical and virtual versions of the city.

This is rather different from Arjun Appadurai's broad conception of mediascape, which refers:

> (…) both to the distribution of the electronic capabilities to produce and disseminate information (newspapers, magazines, television stations, film production studios, etc.), which are now available to a growing number of private and public interests throughout the world; and to the images of the world created by these media. (Appadurai 1999, p.223)

In the case of *Lock 1 Memories*, physical and virtual spaces are aurally superimposed. They are similar to each other, but not identical. In short, even non-processed, non-edited recorded environment sounds played back during a soundwalk would become mediascape, since they have been dislocated in time and space and do not correspond exactly to the current environment. The spatial dislocations occur because it is nearly impossible for the user to walk the exact same path at the exact same paces as the recordings were made. So the spaces of the recordings will never coincide completely. The recordings cannot be synchronised and they carry specific movements and intentions. On that,

[27] Group of artists based in Brighton, UK (http://www.blasttheory.co.uk/).

McCartney states, “Soundwalk recording is mobile recording, and even if the recordist moves silently, their change in perspective is audible in the space” (2010, p.2). Although spatial dislocations between live sound and pre-recorded material are a key, desirable factor, I have tried to avoid great spatial displacements in order to maintain a stronger connection between past and present sounds. This reinforces the illusion of them being one single sonic reality that constantly comes in and out of focus during the walk.

Exploring this dual-reality, *Lock 1 memories* aims to take advantage of alternative mindsets and attention modes that may arise from this mediated listening through a mobile app. The combination of recorded and live sounds should not only reveal some characteristics of the space, but also stimulate the user’s imagination and raise questions about its social aspects: who is present there? What do they do? How do I function here? Is it always like this?

Lock 1 Memories was developed considering that the users would be presented a semi-structured route to follow and that they would be able to experience it at their own pace. That means that the users have some degree of freedom to choose where to go and how fast. This was done that way to add some degree of openness to the spatial and temporal structure of the work. I wanted to present a structure that would not demand a great deal of attention just to “follow the rules”. That is, *Lock 1 Memories*, despite of having clear spatial and temporal limits established, is flexible enough to permit the listener to navigate easily through this virtual structure, experiencing sound above all. This approach is somewhat similar to Andra McCartney’s notion of “soundwalk as improvisation” (2010). McCartney states: “Listening in soundwalks needs to be active, imaginative, dynamic and attendant to the requirements of the moment, similar to the listening of improvising musicians” (Ibid., p. 4).

Although one might say that, the listener uses the map available on the mobile application to ‘navigate’ through the walk, I would advocate that the idea of ‘navigation’ is not accurate. To explain this inadequacy, it is necessary to present

an interesting distinction made by Tim Ingold between 'navigating' and wayfinding:

> (…) wayfinding differs fundamentally from navigation (…) For when navigating in a strange country by means of a topographic map, the relation between one's position on the ground and one's location in space, as defined by particular map coordinates, is strictly synchronic, and divorced from any narrative context. It is possible to specify where one is – one's current location – without regard to where one has been, or where one is going. In ordinary wayfinding, by contrast, every place holds within it memories of previous arrivals and departures, as well as expectations of how one may reach it, or reach other places from it. (2002 p. 237)

According to Ingold, the answers to the basic question "where am I?" can be very different when navigating or wayfinding. In the first case, the question is usually answered by indicating a set of coordinates or pointing to specific point on a map. In wayfinding, the answers draw on narratives of past experiences (Ingold 2002 p. 237). He goes further when he says that "[…] wayfinding might be understood not as following a course from one spatial location to another, but as a movement in time, more akin to playing music or story-telling than to reading a map" (Ingold 2002 p. 238).

Considering this perspective, someone taking part on *Lock 1 Memories*, even if visiting the city or the area for the first time, would be wayfinding not navigating. That is so because the listeners would not use the map to find their exact location in space, correlating the information displayed on the screen and the physical world around. The GPS system already provides this correlation and the visual interface gives updated information to the user. Furthermore, the walk area is not large, so, once at the location, there is no real sense of going to a different place. The user is exploring a homogenous space, a short towpath area. Therefore, in *Lock 1 Memories*, the space and the dislocation from on point to the other is structural and it has its importance, but the piece was conceived in a way that the listener does not have to worry about navigating through it. The space structures the formal aspects of the piece and helps to present an underlining narrative that merges with the personal narrative of each listener.

3.4 Sienkiewicz Pipes

3.4.1 Introduction

Sienkiewicz Pipes is an environmental sound based immersive installation. The piece was inspired by a field recording made at Sienkiewicz Street (Figure 19) in the city of Poznan, Poland, in mid-2012.

Figure 19: Sienkiewicz Street (Poznan, Poland).

It was a rainy evening, at Sienkiewicz Street, when I heard water drops hitting a system of metal pipes. That caught my attention as it immediately jumped from the background texture of the rain in an empty street. It sounded beautiful, rich and dynamic. I had the impression I listened to an improvisation; there seem to be a pattern of some kind, something constant determined by the way the pipes were arranged and the distance between them. At first, I heard the water on the pipes as some kind of improvised percussion performance. Later, listening back to the recordings I had made, I started expanding the rhythm in my head, *auralising*[28] something different. My auralisation was somewhat similar to music

[28] Auralising here refers "[…] to inner sound and sounding, or sounds and sounding perceived subjectively through inner listening" (Oliveros 2011, pp. 162-163).

fragments/exercises written by the Brazilian composer José Eduardo Gramani in his unusual method for musicians to develop a complex sense of rhythm and musical perception. Such exercises combine rhythmic lines in several ways; usually a constant pulse and one or more patterns that change constantly and are not contained in a fixed measure, creating a series of accent dislocations (Gramani 2004). I eventually explored the similarity between Gramani's structures and my inner sounding experience to develop compositional ideas for the installation.

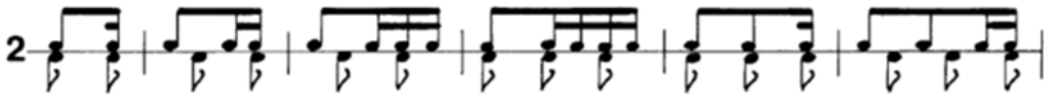

Figure 20: A short excerpt of an exercise by Gramani (2004, p. 19).

3.4.2 Concept

My initial motivation for this piece was to recreate my immediate reading/listening experience of the original dripping sounds. That is, I wanted to create a composition, editing the original field recordings to represent my subjective listening experience of the water drops forming a whole that, at the same time, sounded improvised and with certain constant, structural elements.

Later, I gradually expanded the concept to include clear written rhythmic patterns and percussive sounds. These "artificial" and organised fragments were more similar to Gramani's rhythmic structures I had previously imagined or auralised. From this point on, I started considering strategies to combine the original recordings and the *auralised* sounds into an interactive system so I could share it with others. The installation format seemed adequate as it would allow the listener to have a more private and immersive experience if compared to a concert scenario.

To accomplish that, I have devised an interactive system to simultaneously play back a series of pre-composed rhythmic patterns and processed audio excerpts

extracted from the original field recordings made in Poland. This interactive system uses a touch screen interface that allows the user to (1) navigate through virtual spaces and (2) receive visual feedback related to the sonic output generated by the system. The system is designed for one person at a time. The listener experiences and interacts with the installation, standing at the centre of a small room. Four speakers are equidistantly placed in each corner of the room, pointing to the listener.

3.4.3 Realisation

The piece has four quadraphonic audio 'scenes' that can be controlled by touch. Each scene has a different sonic character defined, mainly, by the balance between the use of the original soundscape audio and the composed rhythmic material. The four scenes are sequential and form an arc that can be followed until its completion or not. That is, a user that chooses to experience the installation for longer might go through the whole arc, but the basic experience of the installation does not depend on that.

For each audio scene, I have written a set of rhythmic patterns that, like in Gramani's exercises, have a common tempo, but they are not confined to clear measures. The patterns are MIDI sequences played in loop and, since they have different lengths, the result is a multiple rhythm with dislocating accents (Figure 21). The patterns also have, for each scene, different intervallic occurrences.

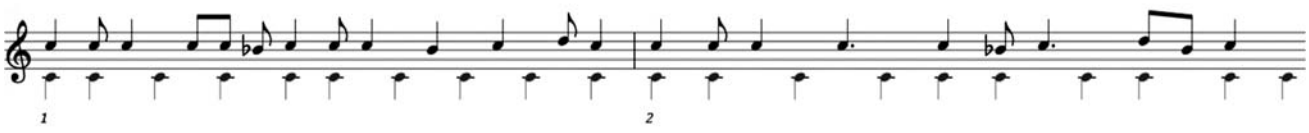

Figure 21: Excerpt of fluctuating rhythmic pattern against a constant pulse.

Some structural choices were guided by a proto-narrative loosely based on the narrative from the book 'Perfume' by Patrick Süskind (1985). In the referred book, the main character, Jean-Baptiste Grenouille, has a super enhanced sense of smell and becomes obsessed by a specific scent he comes across. Grenouille then spends

the rest of his life searching for it, trying to find a way to synthesise the same scent so he can have it at his disposal whenever he pleases. In Sienkiewicz Pipes, each audio scene is an attempt to get closer to the brief musical image I had in my imagination when I first heard the rain drops on the system of pipes in Poznan. Although the proto-narrative is not meant to be accessed by the user, its resulting form, as a reflection of this process, might have an impact on the user's reading.

The final sonic material used in the installation system includes: excerpts of the original field recording, synthesized sounds triggered in real time by MIDI instructions and pre-recorded FFT spectral morphing between the field recordings and some of the composed rhythmic patterns.

The arc composed based on the previously mentioned proto-narrative starts with scene 1, which explores the complexity of the original recordings rhythm and spectral content. In this scene, the user has access to processed and composed fragments of the field recording. Moving toward an artificial interpretation of the rhythm suggested by the rain drops, scenes 2 and 3, focus on the composed rhythmic patterns. The rhythm becomes more complex at each scene and the intervallic relations between notes go from a diatonic hierarchy to random, chromatic occurrences (Table 1). The final scene tries to conciliate/merge both scenarios.

Audio scenes	Sonic Material	Intervallic occurrence
1	Filtered field recording excerpts only	-
2	Written rhythmic patterns (MIDI); spectral morphing between field recording and rhythmic patterns (audio)	Minor and major thirds
3	Written rhythmic patterns (MIDI); spectral morphing between field recording and rhythmic patterns (audio)	whole tone
4	Written rhythmic patterns (MIDI); spectral morphing between field recording and rhythmic patterns (audio); filtered field recordings	Chromatic

Table 1: Audio scenes characteristics.

3.4.4 Interactive system

For the interactive system, I decided to adapt a simple platform I had used previously. The interface is comprised of (a) a sound engine created in Max MSP that controls the spatialisation of multiple sound sources in a quadraphonic setup and (b) a touch screen component that receives gestural input and gives visual feedback according to the user's actions.

This interface helped me to create an interactive experience to allow access to the composed sounds scenes in a straightforward manner. My main concern was to devise an interaction simple and clear enough to be understood by the users and yet powerful enough to handle the dynamic audio and visual layers. The user interacts with the touch screen interface to control a circle that moves around the screen in a two dimensional space. So the interface is used, primarily to control the levels of multiple sound sources, which have fixed positions within a four channel spatialisation scheme. The position of the circle controlled by the user determines the listener's perspective in a virtual space, much like in a video game. For that reason, from now on, I will refer to it as 'avatar-circle'. The displacement

of the avatar-circle on the screen will cause the sound output to vary dynamically as if the listener was moving around several sound sources, listening to the resulting sonic scenario. That is, the volumes for each sound source will dynamically increase or decrease according to the relative position of the circle controlled by the user.

The visual feedback component of the interface serves two basic purposes: (a) to establish a limited, explorable space, in which the user navigates and (b) to update the user's referential listening point through the movement of the avatar-circle. In addition, the visuals also provide feedback related to the sound output. This happens in two ways: (a) the dynamic changes of each sound source present in the virtual room are mapped to the transparency levels of the graphic representations (large coloured circles), on the screen. The louder the audio output is, the more visible the respective circle gets; (b) The sum of the audio output from all active sound sources in a scene controls the brightness of a number of computer monitors placed, facing the walls, behind the plinth that supports the touch screen. The resulting effect is that the light (on the screen and reflected on the walls) pulsate simultaneously with the sound. This dynamic connection between sound and visuals is meant to create an immersive feel and reinforce this interactive experience that balances indeterminacy and fixed elements.

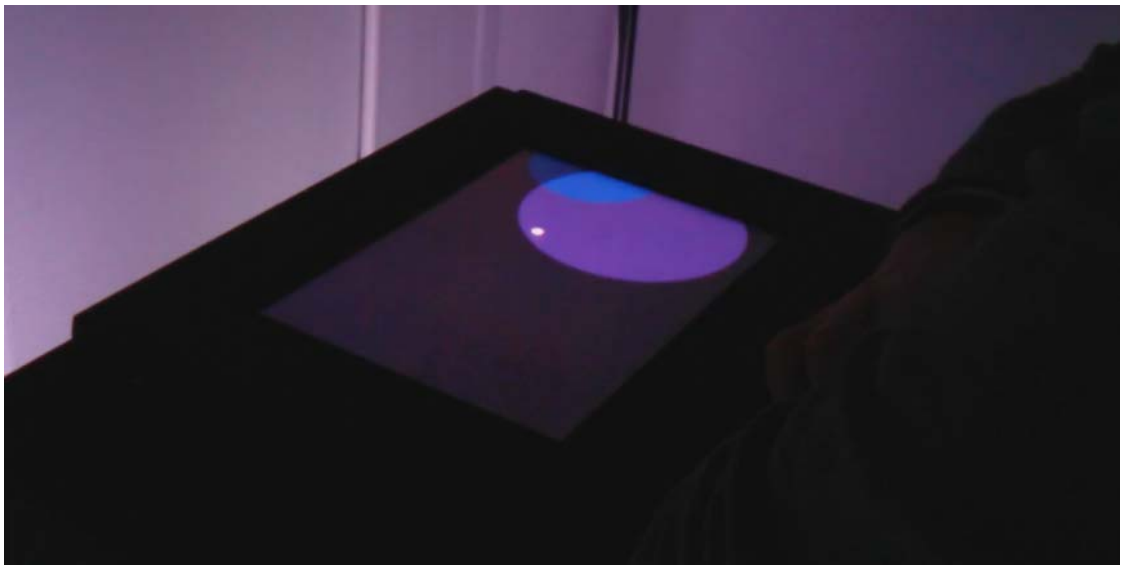

Figure 22: *Sienkiewicz Pipes*' touch screen interface.

The four virtual sonic rooms available can be explored sequentially with a total duration of approximately 9 minutes. A “standby mode” is recalled whenever there is no touch input for longer than 50 seconds. In standby mode, the touch screen displays a few sentences about the metaphor used for the installation while the four speakers evenly play a quiet drone. Once the user touches the screen, the messages and the drone fade out and the sequence of sonic virtual rooms start. At the beginning of each scene, a short message is presented to the user as a poetic cue for what is coming on that particular stage, ex: "Sounds everywhere (can you hide from them?)"; “the rain plays the pipes. I listen”. Such cues are brief and only meant as suggestions with intentional ambiguity. That is, they are meant to resonate differently with each person’s subjectivity rather than present a clear narrative.

Since the beginning of *Sienkiewicz Pipes* development, one of my concerns was to use a widely available solution for the touchscreen interface so the piece could be easily recreated or adapted in the future.

My first attempt was to create a Lemur[29] interface for an Apple iPad. The tablet would receive control data over a wireless network and the Lemur application would generate and animate graphics according to the user’s control. The application performed fairly well, but the graphic elements configurable parameters available were not flexible enough for me to develop the interactive elements I had planned.

Next, I have used different tablets (Android and iOS) running applications such as iDisplay[30] and AirDisplay[31] that turn those devices into wireless external monitors. Computer and tablet would be connected through a local, closed wireless (ad-hoc) network to ensure stable data transmission rates. I have achieved different degrees of success, but, in general, the frame rate of the displayed images was never fast and/or constant enough to ensure a smooth and reliable experience. Another option I have explored was to use a small USB resistive touch screen as second monitor with the UI elements created directly inside the Max MSP patch. In this

[29] Developed by Liine (https://liine.net/en/products/lemur/).
[30] Developed by Shape (http://getidisplay.com/).
[31] Developed by Avatron Software (http://www.avatron.com/applications/air-display/).

case, the frame rate was good, but the colours were washed out and touch screen responsiveness was poor. The best solution I have found was an iOS application called Mira [32] designed specifically to mirror Max MSP interfaces to iPads. It requires a specific Max MSP library to be installed on the computer and, although it can be quite CPU intensive for both the remote computer and the tablet, it performed very well allowing me realise the installation without any technical issues. Another alternative, somewhat simpler, that I have not explored would be to run the Max patch on a Windows computer with an external capacitive touch display attached to it.

3.4.5 Presentations

Sienkiewicz Pipes was presented twice. The first time, during the ICMC (International Computer Music Conference) 2013 in Perth, Australia and later at SAE (Symposium on Acoustic Ecology) in Kent, England. The conditions in which the installation was presented in those two events were not the same and it is important to point out what the differences were and how these might have reflected on the piece's results.

Ideally, this work should be presented in a small (between 4 and 10 square meters), squared room with 4 speakers placed in each corner pointing to centre of the room, where the screen control is. In addition, the room needs to be quiet and darkened. The dimension constraints were established to ensure that the listener would have a privileged point of listening whilst accessing the control platform. The limited space also suggests that the installation should not be explored by walking around the room. The requirement regarding the lighting condition is meant to (a) establish a contrast between outside world and the installation setting; (b) direct the listener's attention to the control touch screen; (c) allow the pulsating colours

[32] Developed by Cycling 74 (http://cycling74.com/products/mira/).

projected by the video monitors to have a sensible impact in the room's light conditions.

In Perth, despite the admirable assistance of the Conference organisation during the event and the quality of the audio equipment provided, the room available for *Sienkiewicz Pipes* was certainly inadequate. It measured about 50 square meters, the ceiling was too high, it was not possible to prevent exterior light from entering the room and heavy traffic noises could be heard at all times. This configuration caused a number of problems: (1) the directionality of the sounds through the quadraphonic PA was not clear enough because the distance between the speakers and the listening point (where the control interface was positioned) was too great and the room was very reverberant; (2) The extra space allowed many people at once in the room, compromising the *single user* experience proposed by the work; (3) The light pulses were not effective enough as they did not change the room's light quality dramatically; (4) the constant traffic noise would sometimes be loud enough to overcome the installation sound.
During the conference, I have, informally, talked to some of the people that had been to the installation site. The feedback I received from these conversations helped to confirm the negative impact of the room's conditions on the attendee's perceptions. It also gave me some different insights on how people were perceiving the metaphor proposed in the interactive setup.

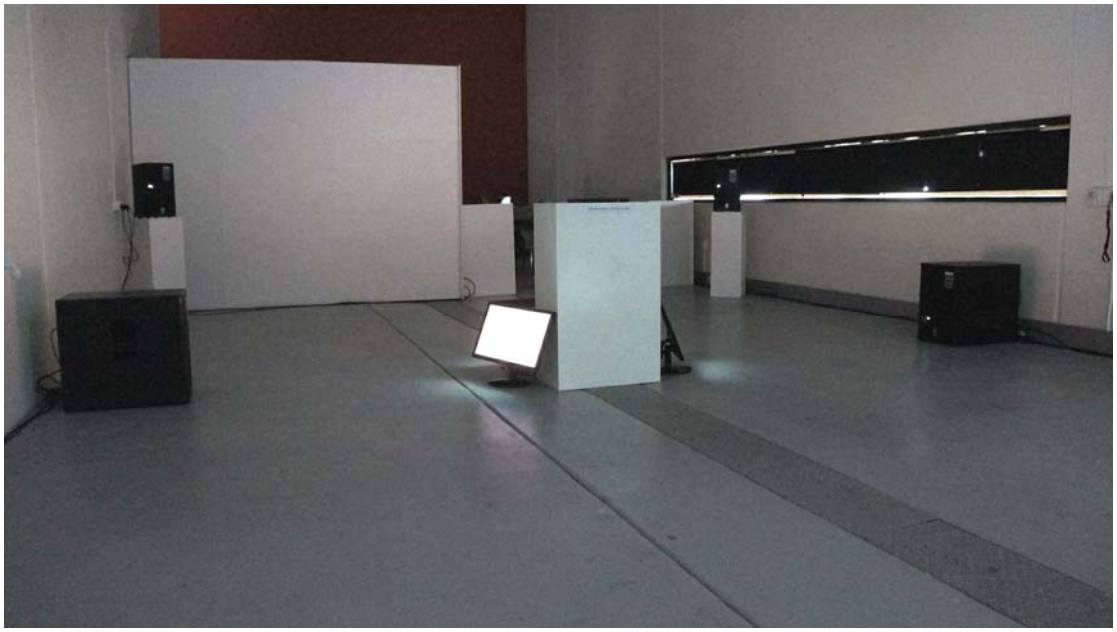

Figure 23: Sienkiewicz Pipes installation at ICMC 2013 in Perth, Australia.

For the presentation at the Symposium on Acoustic Ecology in Kent, the room was much more adequate. It was a small cabin, resembling a container, specifically designed for sound art works. As such, it had adequate electrical wiring and sound and light insulation (Figure 24). With that configuration, the quadraphonic PA was clear, the light levels were adequate (Figure 25) and the desired immersive ambient was made possible. Besides the touch screen, 5 other LCD monitors were positioned around the plinth to create the pulsating effect paired with the sound output.

Based on the feedback received during the first presentation of the work in Perth, a few changes were made to the Max programming: (a) a set of messages/instructions was included on the standby screen, initially a blank screen, to make the interaction metaphor clearer; (b) short comments appear at the beginning of each stage as poetic clues/suggestions; (c) the intervallic changes of the MIDI controlled melodies are more pronounced when the user keeps his/her finger on the screen.

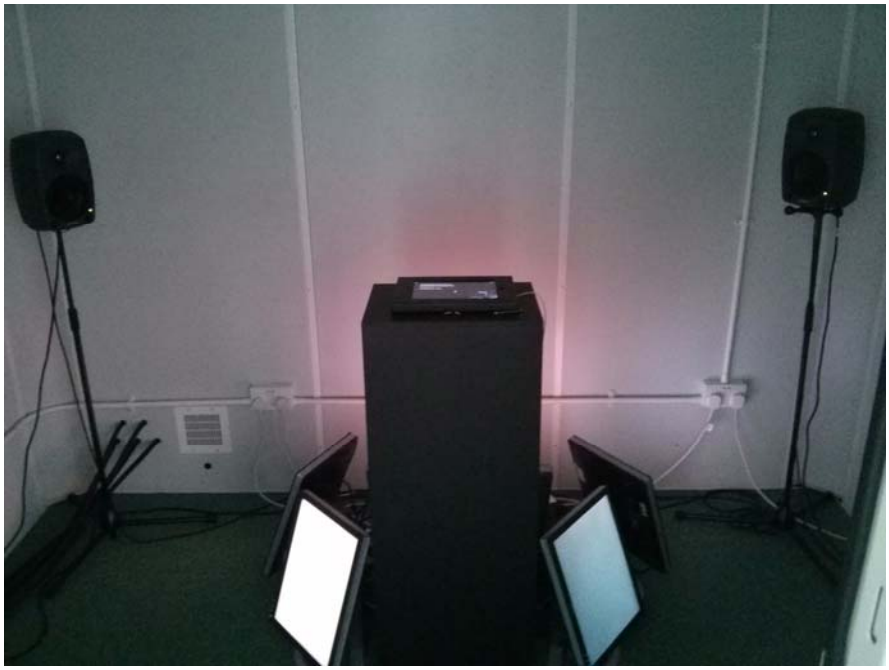

Figure 24: Sienkiewicz Pipes installation at Symposium on Acoustic Ecology in Kent, England.

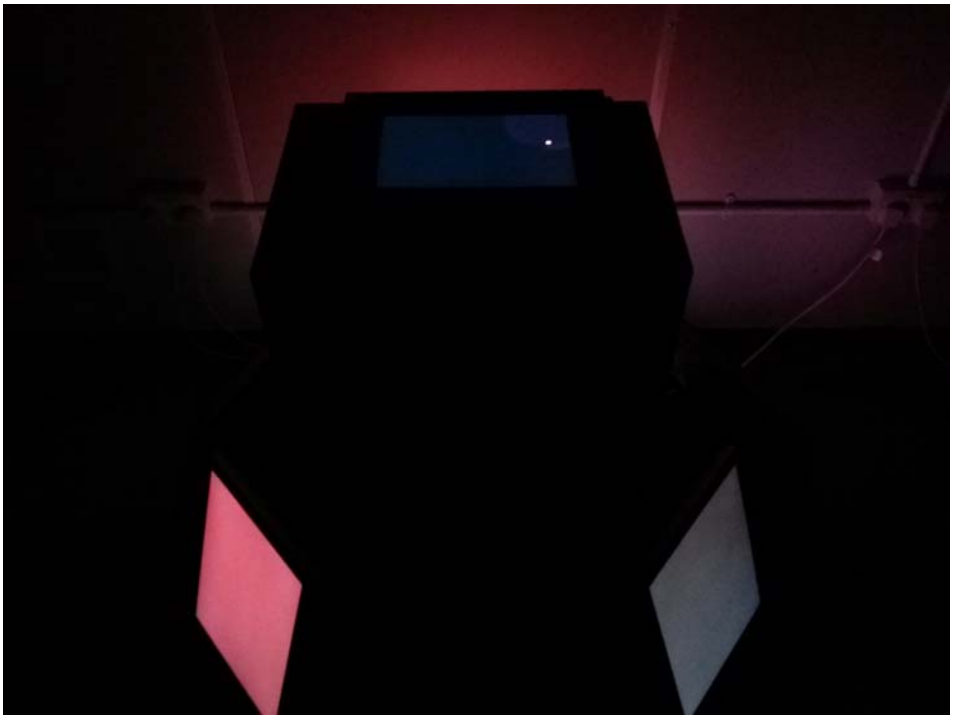

Figure 25: Example of light levels during Sienkiewicz Pipes installation's use.

3.4.6 Discussion

Considering the final format presented in Kent, I would like to briefly discuss some key points that should help to situate this piece in the portfolio. I will address some interactivity aspects in more detail in order to understand how spatial cues were used aiming to structure the piece and to offer a more intuitive experience to users/listeners.

In an effort to analyse the piece's interactive aspects, I have chosen to make use of Karam's taxonomy of gestures in human computer interaction, which is organised according to four broad aspects: "Gesture style, application domain, enabling technology (input) and system responses (output)" (Karam 2005, p. 1). Karam's taxonomy includes:

> […] gesture based interactions from over 40 years of computing literature. Although this work does not claim to provide an exhaustive study of all the literature that considers gesture as an interaction mode, we do hope it will provide a concise overview of the space" (2005 p.1)

Sienkiewicz Pipes uses finger tapping as interactive gesture. One could briefly describe the interaction as it follows: the small avatar-circle moves to the coordinates chosen by the user through the tapping gesture. According to Karam's *gesture style* definitions, *Sienkiewicz Pipes'* presents a *deictic* gesture. Karam proposes that "Deictic gestures involve pointing to establish the identity or spatial location of an object within the context of the application domain" (Karam 2005, p.4). In Sienkiewicz Pipes, the basic gesture of touching the screen with one finger basically informs the system: "move this dot (myself) there" in contrast to Schmandt's classic deictic interactive strategy in "Put that there" (1982). That is, here, the user, similarly to video games, updates his listening perspective by touching the screen in search for sound objects that are present in several fixed positions in the virtual room. So, rather than directly pointing to "identify or establish the spatial location of an object", the user makes use of the abstract avatar figure, to locate and listen to hidden audio-visual objects.

Regarding the 'enabling technology' or input strategy, *Sienkiewicz Pipes* falls into the classification of:

> Non-perceptual input [, which] involves the use of devices or objects that are used to input the gesture, and that requires physical contact to transmit location, spatial or temporal information to the computer processor. (Karam 2005, p. 10)

Considering the broad approach in Karam's taxonomy, there is not a category of *application domain* that perfectly fits *Sienkiewicz Pipes'*. The closest one would be 'games' (Karam 2005, p. 18). In fact, the interface design for this installation piece is inspired in old style abstract 2D games such as Pac Man, which presents an imaginary location and arbitrary rules (Adams 2010, p.36). *Sienkiewicz Pipes* also share with games the components of 'play' and 'pretending', since one could say it is a nonessential recreational human activity that requires "[…] the mental ability to establish a notional reality that the pretender knows is different from the real world […]" (Adams 2010, p.2). But the similarities between the piece and games end there, since the former does not have a clear defined goal to be achieved nor does it have a set of precise rules to be followed by the user (Adams 2010, p.3). The user wanders in a 2D space and experience the surrounding changing sounds; as in the 3D work *LOOP>>60Hz: City of Drones* (Young et al 2014), an "(…) interactive environment [in which] players are invited to pilot a virtual craft and remotely explore this imaginary world" (Barbican 2014). In that sense, the piece is closer to the idea of *toy*, its configuration suggests a certain use, but the actor is free to establish how to proceed and when or why the play should end.

As "system response or output" Karam considers the following: "Audio, visual (2D and 3D) and CPU command responses" (2005, p.20). This aspect is certainly the easiest to point out since it coincides with the main aesthetic goal of the piece: a musical experience that combines visual and sonic outputs. The sound is the main element of the installation. The visual components, both the animation on the

touch screen and the room lights, are complementary extensions of the sound patterns meant to reinforce the musical experience.

The concept of affordance, originally introduced by Gibson in "The Ecological Approach to Visual Perception" (1986) can also be helpful to better understand the interactive aspects of the piece from the perspective of the user. Before starting this brief analysis, it is important to point out a distinction between Gibson's original concept of affordance (adopted here) and Norman's adaptation, which has been widely used, often imprecisely, by the human-computer interaction community (McGrenere and Ho 2000).

Affordance is a neologism created by Gibson and it refers to properties of objects, or any environmental element, that might provide to animals (including humans) interaction possibilities. Gibson provides an example:

> If a terrestrial surface is nearly horizontal (instead of slanted), nearly flat (instead of convex or concave), and sufficiently extended (relative to the size of the animal) and if its substance is rigid (relative to the weight of the animal), then the surface affords support (1986, p. 127).

Gibson's original idea of affordance is independent of an actor that might come to interact with a certain object. The affordance exists independent of it being perceived by someone. "The observer may or may not perceive or attend to the affordance, according to his needs, but the affordance, being invariant, is always there to be perceived" (Gibson 1986, p. 139). Norman, on the other hand, conceives affordance as "(...) both the action possibility and the way that that action possibility is conveyed or made visible to the actor" (McGrenere and Ho 2000, p. 181). According to Norman, if there is no available information and if the actor does not perceive a certain action possibility, there is no affordance. "I believe that affordances result from the mental interpretation of things, based on our past knowledge and experience applied to our perception of the things about us" (Norman 2002, p. 219).

What elements in *Sienkiewicz Pipes* can be identified as directly perceived information connecting to designed affordances? The touchscreen itself constitutes a relevant piece of information, signalling that it is possible to touch, or that is expected from the user to interact with the work through the touch interface. By touching the screen, new information immediately becomes apparent: a translucent circle that briefly flashes to indicate where the touch action occurred and the little circle, which is always showing, moves to the same coordinates as the registered finger input. These additional signals, respectively, confirm the touch interactivity previously indicated by the presence of the tablet in the centre of the room and show the immediate level of control the user has when touching the screen, which is to move the little circle around on the screen. These nested affordances are examples of complex actions and coincide with what Gaver calls "(…) sequential affordances, a concept (…) to refer to situations in which acting on a perceptible affordance leads to information indicating new affordances" (1991, p. 82). In a second moment, the user might notice more sequential affordances as the large pulsating circles, which have their behaviour paired with the sound output (the louder a sound source is, the clearer the respective circle gets). Also, at this point, the user might become aware of the correlation between the dislocation of the small circle on the screen and the sound output balance. If that is so, the user would have reached the end of the sequential affordances chain as it has been designed and he will be able to choose either or not to explore the sonic elements placed in the virtual rooms.

There is one consequence to the user's touch actions that was designed to be subtler, while the user keeps his/her finger in contact with the screen, the MIDI controlled melodies will have their range and speed of interval change increased.

As Gaver states, "If there is no information available for an existing affordance, it is hidden and must be inferred from other evidence" (1991, p.80). Similarly, Gaver talks about "false affordances", when there is information that suggests an affordance that does not exist. Or, as Gibson proposes, "(…) if misinformation is picked up misperception results" (1986, p. 142). In an initial version of the

installation system, I was using a specific Mira object in Max MSP (running on the remote computer) that was capable of detecting multi-touch input. And, although only one-finger touch would be mapped to the control of the avatar-circle, the Mira app (running on the iPad) would present visual feedback, brief white flashes, for each individual finger that would touch the screen. That, no doubt, was a misleading information, pointing to affordances that did not exist and it proved to be misleading to users that had no previous detailed information about the system's interaction scheme.

It is safe to say that the underlining metaphor in *Sienkiewicz Pipes* can inform about the interactive scheme/affordances present in the system. And if the user is not aware of it (the metaphor), the interactive and perceptual experiences can be compromised or become much less intuitive. The brief instructions/suggestions presented on the bypass screen and when entering each virtual room are meant to help the user better understand the system's metaphor before him/her.

Assuming that the user is somewhat familiar with abstract 2D representations of space, as seen in video games for example, and comprehends the system's metaphor he/she should be able to identify the main affordances and interact with the installation, exploring its virtual space. This space is presented in sequential scenes/stages. Each of these scenes is a pre-composed audio-visual scenario that combines the space represented in 2 dimensions, the sonic output and the light in the room. Those last two aspects work in a way to extrude the 2D space to a third dimension, involving the listener.
So, the representational spatial elements presented, namely the room represented in two dimensions, the spatialized sound around the listener, the avatar-circle and the sound sources indicated on the screen are all linked in a way to provide a coherent, dynamic and intuitive immersive experience. The immersive character is intensified by the physically limited sonosphere; the sound inside the installation room (inner sonosphere) is all that can be perceived by the user.

This resulting combined-space is also an improvisational space that is reconfigured at random at every cycle of the installation. The fruition agent here, by controlling the avatar-circle, is submitted to a constant change of perspective in two fronts: (a) the screen-navigation enables crossfades between sonic layers, thus potentially shifting the listening focus and changing how the various rhythmic accents relate to each other; (b) the music patterns themselves have divergent accentuations that change over time, so there is no clear sense of downbeats or stable bar structure.

3.5 Up the Hill

3.5.1 Introduction

Up the Hill is a sound installation based on field recordings made at Cave Hill Country Park[33] and created specifically for the Soundscape Park[34] in Belfast (Figure 26). This small park/garden, open to the public during weekdays, is meant to be a "permanent interactive sound installation" that hosts a great number of works scheduled from 9 to 5PM. The space, also known as 'The Bridge community garden', used to be a private parking space and it was created with combined aid from private companies (BT Group – that donated the land, and Biffa) and public institutions (Department for Social Development and Belfast City Council).

> With close proximity to Sure Start, an early years care organisation for children, the garden can be used as a secure play area. It is also hoped, along with the interest generated from the Soundscape Park Project, the gardens will be visited by the local community and beyond (Soundscape.org 2015).

Figure 26: Bridge Community Garden/Soundscape Park Belfast.

[33] http://www.belfastcity.gov.uk/leisure/parks-openspaces/Park-6622.aspx.

[34] http://www.soundscapepark.org/.

The park is equipped with 12 environmental speakers: 9 omnidirectional on the ground and 3 directional at height (Figure 27).

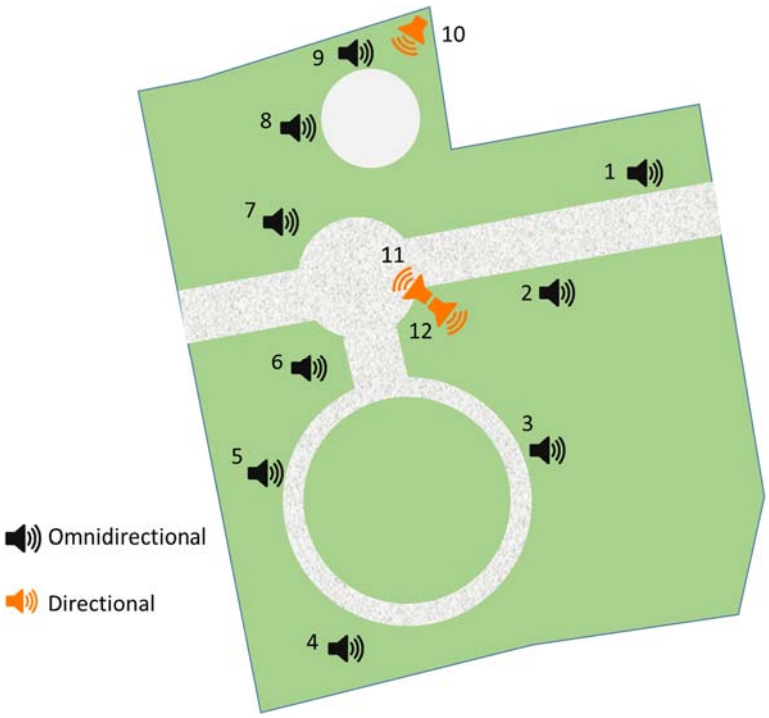

Figure 27: Soundscape Park speaker placement diagram.

3.5.2 Concept

After being invited to contribute to Soundscape Park project, my starting point was to devise something that would, at the same time, fit the project's general aesthetical guidelines and contribute to my portfolio. The initial, germinal idea was to compose an audio scene with environmental non-urban sounds used in a way to create several sound displacements or *ghostly* effects.

At that time, I had been doing a series of field recordings in Belfast, trying to capture sounds from different locations, at different heights in the city, using regular and contact microphones. Cavehill, a hill about 400 metres high overlooking the city of Belfast, was included in my list of places to record as I wanted to record the diffuse and distant sound of the city from a distance. Soon I realised the hill offered a rich and varied system of sounds on its own. From this

point on, I started to re-think the plans for the Soundscape Park; instead of creating an audio scene focusing on *displaced sounds*, I considered the possibility of creating a miniaturised version of the much larger environmental sound system of Cavehill to "apply" it to the park. In this new concept, the audio scene should be almost believable, it should somehow blend itself with the general characteristics of the park.

3.5.3 Realisation

For the recording process, I decided to follow, partially, the marked routes of Cavehill Park. I walked through both north and south routes stopping often to record. All takes were static as I did not consider it would be interesting to have soundwalks as source material for this project. In some situations, where a distinct localised sound source was available, I did closer recordings. On the top of the hill, because of the strong winds, I had to use a heavy windshield. But the wind was actually one of the elements I was counting on, for I wanted to capture the sound of the grass being blown by the frequent strong gusts of wind. For these recordings I experimented hiding the microphone in the grass and in some bushes with varied angles to try and avoid the direct pressure of the wind.

The next step was to determine whether or not the sounds I had recorded were diverse enough to allow me to compose a rich audio scene. I then grouped the various recordings into sets of sounds according to similarity. Before going any further in terms of editing or processing, I chose a few elements I wanted to use and tried to devise a general strategy to introduce them into that much smaller space of the Soundscape Park. I took advantage of the asymmetrical configuration of the park and divided it in 4 zones (Figure 28). The zones were established according to speaker placement and the position of present physical elements: gate; corner/mural; round area/benches; rear gate/path.

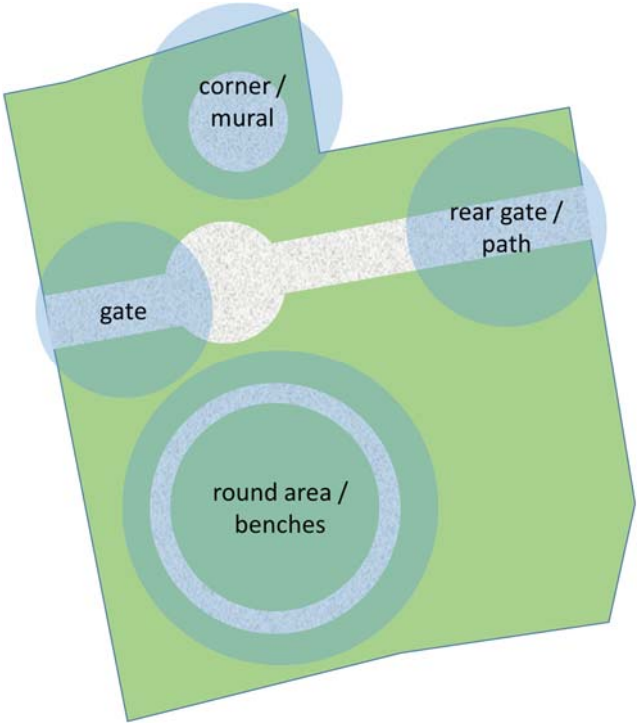

Figure 28: Soundscape Park; 4 established zones.

This configuration of the park seemed ideal to explore complex, multi-layered compositions of environmental sound – something that became a complementary goal through the course of the research, after dealing with the simultaneous playback of three soundwalks in *Come Across*. Having all the sounds organised according to their content, I chose some of them from 4 areas (I call zones A, B, C and D) of Cavehill to be relocated to the Soundscape Park (Figure 30). I edited the material to create 12 different audio tracks, one for each speaker of the park. Some tracks have sonic elements in common and are spatially grouped together to better delimit the zones. That is, adjacent tracks, even with fairly different contents, always have some spectral content in common to reinforce the coherence and sense of continuity of the final aural outcome when projected through the omnidirectional speakers. Speakers 1 and 2 relate to Zone A and its main characteristic sound is of running water. Speakers 3, 4, 5 and 6 use sounds from Zone B and present mostly the sound of the wind from the top of the hill. Speaker 7, related to Zone C, is placed near the entrance gate and it occasionally plays back sounds from a rusty metal gate from the top of Cavehill. Speakers 8 and 9, Zone D, present sounds of birds in bushes and close trees. At last, speakers 10, 11 and 12 add

an ambient texture or “air” without clear foreground sounds, except for the occasional singing of distant birds. This zone was the last to be created to interconnect the other ones with an “averaged” sonic texture. Figure 29 shows an illustration with the main zones at Cavehill where the sounds were captured.

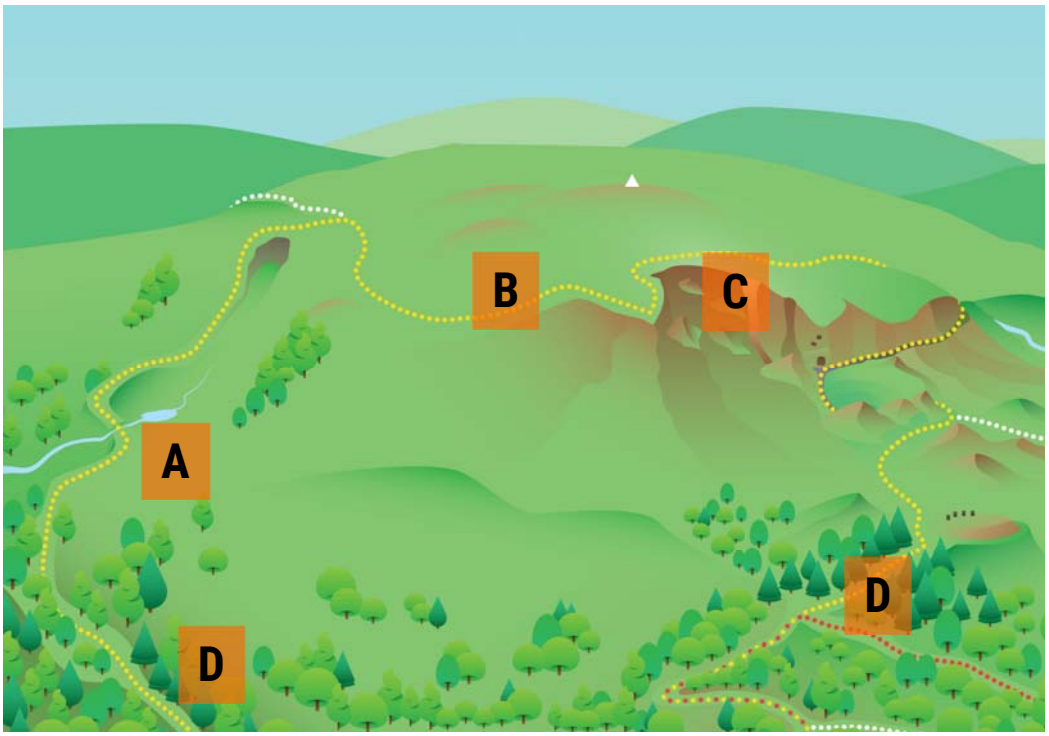

Figure 29: Cave Hill Country Park - Illustration by Heater Browne.

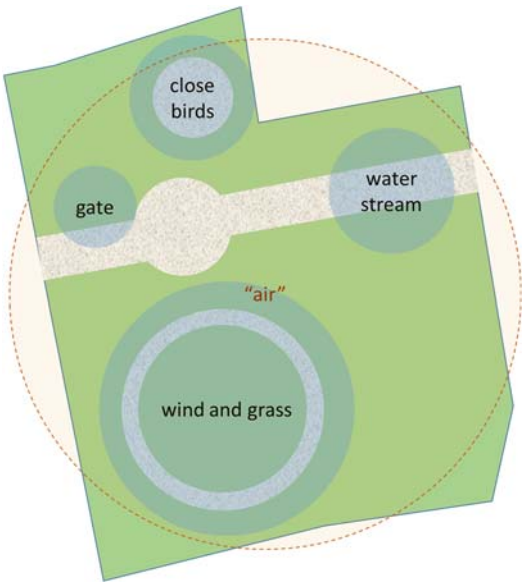

Figure 30: Basic scheme of sounds relocated to the Soundscape Park.

3.5.4 Discussion

Up the Hill, as one of the last pieces in the portfolio, aims to revisit some of the ideas explored in previous pieces, specifically *Lock 1 Memories* and *Sienkiewicz Pipes*.

In *Lock 1 Memories*, I have superimposed layers of environmental sound to the sounds currently present during the walks. The extra sounds, added by the mediating technological apparatus were recorded in the same space as the walk using binaural microphones to enhance the sense of belonging. But the temporal dislocations caused by the playback of recorded media and the use of processed sounds (that only come to surface if the walking pace is slow enough) would generate a series of phantom effects. In *Up the Hill*, the relocated field recordings do not match the environment of the park, but I make an effort to create a partial, subtle illusion they do. In both cases, I intend to achieve more or less smooth transitions between natural and mediated sounds in open spaces, but the strategies are quite different in each piece.

Up the Hill and *Sienkiewicz Pipes* are the only installation pieces in the portfolio. Both present an explorable area with an aural content as result of the combination of discrete, independent audio channels. The key difference between them is that the space in *Up the Hill* is a larger, physical area to be explored by walking as opposed to the virtual space exploration of *Sienkiewicz Pipes* done by touching the installation's control screen. In *Sienkiewicz Pipes*, the aural space is formed in three different ways depending on the current 'scene'; (a) by multiple layers of processed environmental sound, (b) by layers of asymmetrical synthesised rhythmic patterns or (c) by a combination of the previous two. The sonic outcome is meant to avoid a pre-established development in time. Even the rhythmic patterns, not being organised according to a common time signature, result in an abstract artificial landscape formed around the listener. But the use of sequential virtual rooms (or 'scenes') impose to the experience a proto-narrative arc. In *Up the*

Hill, I have tried to eliminate any notion of arc or cycle. The piece is based on sounds in space, there is no beginning nor end. The audio loops are fairly long and they have different lengths so it is almost impossible to identify repetition of elements in it. It is meant to be a constant sound texture, erected in the park; any sense of sequence of events is only established by the individual exploration strategies of the fruition agent.

The multi-channel arrangement at the Soundscape Park makes that space a potential stage for relocated environmental sounds. The possibility of relocating a set of sounds to that particular "neutral" space carries, by itself, great creative potential. In *Up the Hill,* I tried to explore the simple architectural relations and hierarchies of the actual space (e.g. its corners, the grass circle and benches, the footpath etc.) to reshape sounds and allow perceptual re-significations. In a way, the accommodation of sounds, keeping some particular spatial imprints, into another space is similar to what Bill Fontana (2008) calls *sound sculpture*. According to Fontana (Ibid.), recordings carry embedded sculptural/spatial qualities from the space where the sounds were emitted. When a sound is moved from one location to another, the consequent result is a combination of both spaces, resulting in a re-sculpted sonic ambient. Fontana comments on the origin of his approach to sound relocation:

> Influenced by Duchamp's strategy of the found object, I began to realize that the relocation of an ambient sound source within a new context would alter radically the acoustic meaning of the ambient sound source. I conceived such relocations in sculptural terms because ambient sounds are sculptural in the way they belong to a particular place. To make an out of an ambient sound, the act of placing this sound would have considerable aesthetic importance (2008, p. 154).

Being a fixed work, *Up the Hill* differs from Fontana's sound sculptures that "(…) create networks of simultaneous listening points that relay real time acoustic data to a common listening zone (sculpture site) (Fontana 2015)".

Although the sounds relocated from Cavehill to the small Soundscape Park tend to contrast in relation to the car traffic sounds of the surroundings, they do not sound completely alien. In Fontana's terms, one could say that the sounds have been re-sculpted on the park. From the noisy gate to invisible birds, everything is placed carefully to sound as it was emerging from the park itself. This enables a fragile illusion that the sounds belong there. The zones that have more characteristic foreground sounds are immerse in a compatible background texture. About considering the context of *sculpt site*, Fontana states:

> In both my field recording and sound sculpture, sounds are not isolated from their contexts; in relocating sounds, I have been concerned with the contexts in which the sounds are placed and with the sculptural/spatial qualities of the sound source. For me, the richness and beauty of ambient sounds come from their interaction with a living situation. For this reason, I have installed most of my recent sound sculptures outdoors, in juxtaposition with actual contexts of ambient sound. In addition to the sound content, the acoustic conditions and architectural qualities of such contexts have played important roles in my selection of sculpture sites. (2008, p. 154)

In *Up the Hill* the relocated sound is meant to significantly disrupt the regular sonosphere. The inner and meso spheres are heavily altered by the projected sounds. Nevertheless, there is no drastic rearrangement of sonospheres, only a superimposition.

Up the Hill is the only piece in the portfolio that does not make use of any visual representational device. The physical space combined with the spatialised sound (a representational component) is meant to set the limits of the fruition space. As a result, the sounds have mostly *field* functions as there are no specific visual cues connected to discrete sonic elements. The occasional sounds of the metal gate and the almost constant rumble of the water stream create a less disperse connection and could be understood as part of a *stage* frame; the rest of the sonic content occupy the broader *arena* and *landscape* frames. Walking around the park/garden,

because of the discrete speaker arrangement, can cause some of the perceived elements to shift between *arena* and *landscape* frames.

As mentioned before, in *Up the Hill*, the sound relocation does not aim to create a *ghostly* sounding scenario. The idea is to create an 'almost believable' superimposed sonic ambient. In a way, the projected sound fits the park environment because it "matches" the natural, green surroundings, but the proportions and elements are not quite right. The prepared sonic scene carries the dimensions of Cave Hill and it adds a few dislocated elements, such as birds and water. There is a contrast between the sounds from the surrounding area and the projected ones inside the park, but in a subtle way. Ideally, the *fruition agent* would experience moments when he/she would temporarily forget there are speakers placed around the place, while experiencing this artificial "aural oasis".

The fragile illusion that the sounds belong is easily broken by the lack of visual stimuli paired to some components of the sound. A few foreground elements, namely the bird songs and rusty metal hinges, are less alien and can be 'justified'; the birds could be hidden somewhere in the bushes or up on the tress, and the metallic noise is invariably associated with the actual gate of the park. The water stream and gusts of wind sounds will not be paired to any other sensorial evidence and will be revealed as artificial devices they are, phantoms as described by Merleau-Ponty in the following passage:

> If a phenomenon—for example, a reflection or a light gust of wind—strikes only one of my senses, it is a mere phantom, and it will come near to real existence only if, by some chance, it becomes capable of speaking to my other senses, as does the wind when, for example, it blows strongly and can be seen in the tumult it causes in the surrounding countryside (1962, p.318).

Up the Hill is another piece in the portfolio with strong site-specific characteristics. Although the piece is not about the place (i.e. the garden), it includes a number of qualities that reinforce its relationship with the space: it is shaped according to the

site's spatial features; it makes use of the architectural qualities to organise the relocated sonic material; it takes into consideration the use people make of the space; and, by merging environmental sounds from Cavehill with the landscape of the garden, it aims to enhance the latter aesthetic qualities.

Although soundwalks were not part of the preparation/composition process as other pieces in the portfolio (i.e. *No Chords Attached*, *Come Across*, *Lock 1 Memories* and *A Blue Bridge*), soundwalking is a probable way to experience the installation at the park. Since *Up the Hill* presents contrasting sonic zones inside the small area of the park, it makes possible short soundwalks that would reveal smooth yet somewhat unnatural transitions for such a compact area. In addition, since the work does not present a linear structure or indications on how it should be experienced, the directions choices of a walker/listener will re-define and re-shape it despite the fixed character of the original media. Up the Hill's openness characteristics are revealed on both the complex sound quality and the re-configurable structure determined, respectively, by the fruition agent's subjective interpretations and movement decisions.

3.6 A Blue Bridge

3.6.1 Introduction

A Blue Bridge is a soundwalk based audio-visual piece for 16 channels. The work presents readings of a particular urban space in the city of Belfast through an interactive performance that recreates a soundwalk, juxtaposing and superimposing layers of sound, light and memories. It proposes a semi-open concert situation, conducted by a performer that leads the audience through a reconstructed experience composed of fragments of several recordings of a single route, a crossing of a footbridge over the river Lagan (Belfast).

3.6.2 Concept

The embryonic idea for this piece was to create a performance situation that would enable me to highlight/comment on a specific urban place in the city of Belfast with the following characteristics: (a) urban surroundings, not far from the city centre, (b) sonically interesting[35] and (c) somewhat calm despite being close to the city centre. Those characteristics come from my personal interest in what I call "sonic hideouts", places partially isolated, in which I feel like I am in a privileged situation to listen to the city sounds.

After surveying different locations that shared those characteristics, I have chosen an unnamed foot bridge located between Albert and Queen's bridges (Figure 31). Its architectural configuration provides a walk path with multiple listening points when crossing over the River Lagan. A myriad of sounds reach the bridge (distant traffic, birds, cyclists, pedestrians etc.) with a unique reverberation quality. Another interesting fact is that the bridge also houses a railway and the trains

[35] Varied sound content, rich spectrum and diverse emission distances.

crossing alongside the footpath complement the bridge's sonic uniqueness with the rattling of the rail tracks (and the bridge itself) and the train's loud and reverberant horns.

Yet those characteristics are actually secondary. I have chosen this location mainly because, at the same time it fits well my idea of a "sonic hideout" and it is not a hidden, secluded, inaccessible place. It is right there, near the Central train station, a busy commercial area and, yet, it is a much calmer place.

Figure 31: Footbridge over the River Lagan.

The choice of a comparatively quieter location is not related to any ecological perspective. It is a matter of personal choice; in specific situations, I appreciate less saturated sound environments for they allow me to extend my listening to greater distances. Hölzl, when discussing *noise pollution* in urban environments, suggests that the presence of some sounds can actually have comforting and reassuring effects:

> The mumbling stream, that is, all the human voices reaching me from the meso and outer sonosphere (…) [give] me security and confirmation of my existence in a social and not an isolated environment (2003, p. 7).

In a similar way, the sum of urban sounds that reach me on the bridge have a positive impact as I feel safe being constantly surrounded by the familiar sonic elements of the city.

In *A Blue Bridge,* I propose a refocused, mediated listening to fragments of everyday life. This is done in a concert situation in which one performer, dressed in white, stands in front of a white screen and controls, using a wireless gestural interface, the spatialisation and live processing of 16 discrete audio channels. During the whole performance, a video collage made with recordings of walks crossing the bridge from west to east is projected onto both the screen and the performer. The video was edited in a linear manner to show a walk from 'point A' to 'point B'. Although the excerpts used in the final collage maintain a spatial continuity, the fragments belong to recordings made in different days, at different times. The work intends to present a dynamic dual situation, by shifting from a "real" sonic environment - always in agreement with the landscape and its content shown in the video projection, and an "imagination" layer that corresponds to the fragmented, edited and processed sonic elements. So, in the context of this piece, the shifts between layers are meant to represent transitions between listening and daydreaming.

3.6.3 Realisation

I visited the area a several times to listen[36] and record audio in order to have a better idea of the sonic elements present there and to assess how diverse they could be

[36] In a disposition similar to the one suggested by Westerkamp (2007) in her "soundwalk composition" procedures: "Go out and listen. Choose an acoustic environment which in your opinion sets a good base for your environmental compositions. In the same way in which architects acquaint themselves with the landscape into which they want to integrate the shape of a house, so we must get to know the main characteristics of the soundscape into which we want to immerse our own sounds. What kinds of rhythms does it contain, what kinds of pitches, how many continuous sounds, how many and what kinds of discrete sounds, etc. Which sounds can you produce that add to the quality of the environmental music? Create a dialogue and thereby lift the environmental

in different situations. Next, I recorded a few soundwalks to try and determine a route for the piece. Once the route was chosen, I recorded several videos and defined a simple video script to be followed on the final recordings. The idea was to simply cross the bridge from the west to the east side, recording audio and video, at different times of the day. The recordings would then be edited to make a series of, more or less smooth, transitions between cuts.

So *A Blue Bridge* is formatted according to the actual shape of the foot bridge, that is, the soundwalk across the River Lagan determines the main form of the piece. Despite being an audio-visual work, *A Blue Bridge* is primarily thought as a sonic exploration. The video component was carefully planned to function as a complement to the sound and not to shift the main focus to itself. The visual component provides a referential frame, a window for the audience to have a glimpse of the performer's presence on the original recording site and to help define limits, in spatial and contextual terms, of the particular micro universe presented. The one-directional dislocation and the fairly constant architectural frame the bridge provides were intentionally considered as means to limit the visual stimuli. Some of the initial footage of the bridge had too much movement from side to side and, as later became apparent, it represented a distracting, unnecessary component. The final video tries to keep the camera movements as straight as possible, without eliminating the characteristic bouncing of the walk, which works as an indication of the soundwalker's presence.

sounds out of their context into the context of your composition, and in turn make your sounds a natural part of the music around you. Is it possible?" (unpaginated).

Figure 32: Two snapshots of the performance; west and east ends of the bridge.

As soon as I had the general concept of the piece established, I started considering ideas for a control interface. I wanted something simple, not too similar to known instruments or control interfaces and fairly simple to manipulate. A sphere with built-in motion sensors was the first thing I have tried and the results were better than I could anticipate. Not only it fit my initial criteria, but it added some interesting aspects to the performance. If the manipulation was to be done mainly by tilting and rotating the sphere along different axes, even in a simple one-to-one mapping scheme, it would be hard, if not impossible, to independently control two distinct parameters. That means that the one-to-one mapping scenario, in practice, becomes closer to a one-to-many or many-to-many mapping (Hunt 2000). A simple wireless spherical controller allowed me (a) to have a subtle, somewhat neutral control interface; (b) to have no discrete and visible controls, keeping the

mapping strategy partially hidden. In addition, the use of accelerometers made possible to manipulate the sphere with subtle, slow, broad gestures without any discrete triggers.

The engine for the control interface's prototype was a combination of an Arduino[37] board with an Xbee[38] module and a MPU-605[39] module, which contains both accelerometer and gyroscope sensors in one board. I eventually replaced this setup for a simpler and more compact one. The final version of the control interface is a combination of a hollow sphere made of polystyrene foam and an Android mobile phone that transmits OSC data from its accelerometer and compass sensors. The application used to relay OSC messages is called 'oscHook'[40].

The main sensor data - received and mapped onto different sound controls and processing parameters in a Max MSP patch, is related to *roll*, *pitch* and *azimuth* movements. Velocity, acceleration and sudden broad movements data are also used.

I wanted the control interface to be visible, but somewhat inconspicuous. A white sphere seemed appropriate for a number of reasons: (a) It has a known shape, but does not necessarily point to a specific functional object or instrument; (b) The colour allows it to become 'camouflaged' during the video projection, adding a subtle, but noticeable, distortion to it because of its curvature; (c) It can be easily manipulated; (d) It allows the use of accelerometer and compass data in a fluid way. That is, there are no discrete controls and it is nearly impossible to manipulate it without changing the values of only one parameter.

A custom Max MSP patch was created to manage 1 video file and 16 audio channels grouped in two layers: 8 fixed ("real" sounds layer) and 8 manipulated and processed in real time ("imagination" layer). The fixed layer contains several stereo

[37] http://www.arduino.cc/

[38] http://www.digi.com/xbee/

[39] http://playground.arduino.cc/Main/MPU-6050

[40] https://play.google.com/store/apps/details?id=com.hollyhook.oscHook&hl=en

recordings of the walks done in different times of the day, edited to create a number of sub-layers. This approach allowed me to assemble a number of complex sonic environments that resemble the original ones, but expanded from stereo to 8-channel surround scenario. This composed layer is formed by, basically, 3 sub-layers: (1) background, a soundscape rumble containing only very distant sounds and no distinct foreground event; (2) not so distant and fairly constant sounds, such as car traffic, construction machinery, train horns etc.; (3) other train sounds and distant, not so common sounds, like bells and explosions. The final arrangement of such sub-layers is rather complex since it takes into consideration the changes in perspective of each part of the walk and the position of the main physical sound sources in the original space. Crossfades, frequency filtering and spectral morphing are some of the resources used to realise the editing stage.

During the performance, these 8 channels are played back synchronously with the video. The live performance actions might affect them by controlling the general output levels and by applying a low-pass filter. In terms of content, this first layer presents manly background, ambient sounds, without too many distinct sonic events being heard.

The second audio layer ("imagination") contains heavily edited recordings, presenting mostly foreground sounds that can be processed and brought to the foreground by manipulating the control sphere.

The mapping strategy that connects the control interface and the Max MSP patch has 2 main components: (a) tilting the sphere backwards, altering its *pitch*, causes the video projection to become blurry and alters the balance between the "real" and "imagination" layers; the former has its volume lowered and a low-pass filter is increasingly applied, the latter has its base volume raised; (b) altering the *azimuth* angle of the sphere raises, one by one, the volume of specific channels on the higher speakers ("imagination" layer).

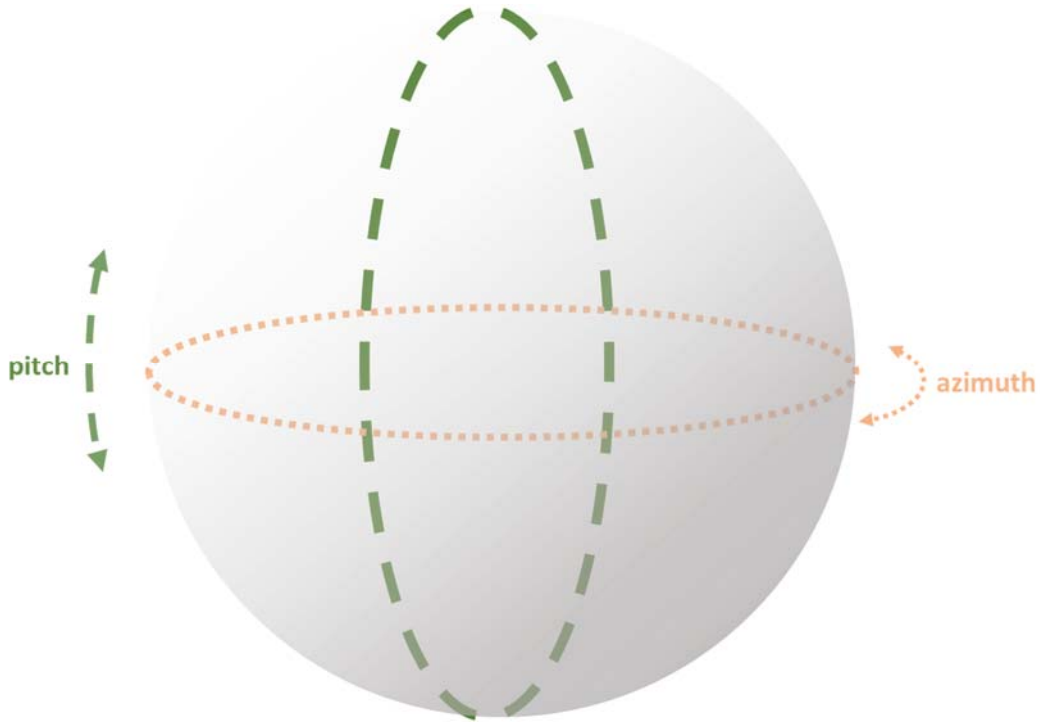

Figure 33: Axes mapped to the Max MSP patch to control audio and video.

The piece presents a slow development, in which the video cuts become increasingly abrupt and the imagination sonic layer becomes more apparent. The walk was divided into a series of moments (or 'scenes'), in which particular sonic events are more likely to be available for the performer to explore.

3.6.4 Presentation

This piece was presented during the 2015 Sonorities Festival in Belfast. The concert venue for this performance, the Sonic Lab[41] at the Sonic Arts Research Centre (Queen's University Belfast), is equipped with a 48-channel diffusion system. Taking advantage of such facility, the original 16 channels of the piece were mapped onto 32 channels. The 8-channel "real" sounds layer was directed to a ring of 8 speakers on the ground level, around the audience, and to another 8 speakers on the lower level of the room. The 8-channel "imagination" layer, was mapped to

41 http://www.sarc.qub.ac.uk/sites/sarc/AboutUs/TheSARCBuildingandFacilities/TheSonicLab/.

other two sets of 8 speakers, one just above the audience and the second one near the ceiling (Figure 34).

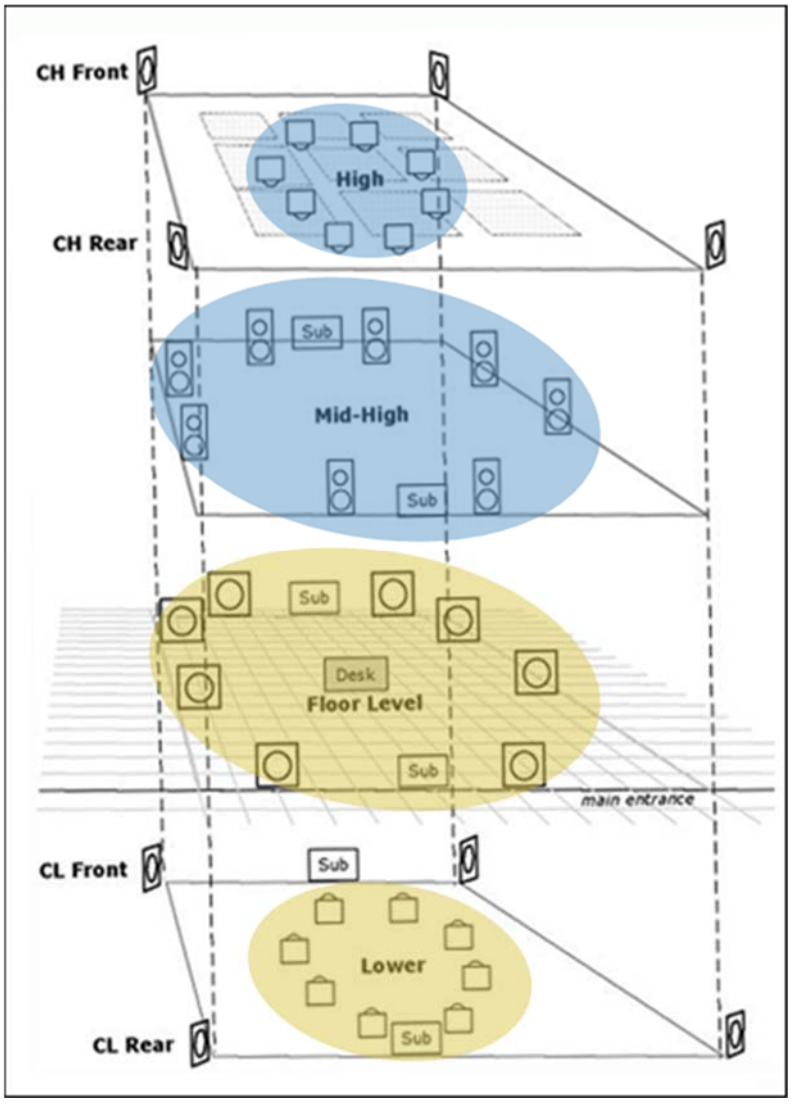

Figure 34: Speakers placement in the Sonic Lab and mapping of sonic layers: "real" (yellow) and "imagination" (blue).

3.6.5 Discussion

As all pieces in the portfolio, *A Blue Bridge* was developed around a spatial framing that influences its structure and final presentation format; it uses environmental sound as primary sonic material and it aims to create a semi-open artistic experience. But as the last project realised during this research, *A Blue Bridge* also

brings several ideas of the portfolio together. That is, it revisits ideas and approaches used in other pieces, not in the exact same way, but adapting them to the new context.

Come Across presented a strategy that involved the preparation and recording of multiple soundwalks. The resulting audio-visual material, unedited audio and cropped video, was then presented in a performance conducted by the soundwalkers drawing lines on a paper map to indicate their routes as the piece unfolded. The performers would also make commentaries by writing in post-its placed on the paper map and by showing pictures of key places visited. *A Blue Bridge* proposes a similar experience, a re-lived soundwalk, shared with the audience in a concert situation and with additional commentaries. Only in this case, it is a single collage soundwalk, with only one route reconstructed in audio and video. The performance of *Come Across* had 3 visual elements on stage: (1) the performers and the drawing table; (2) the projection of the map being drawn and (3) the cropped videos montage (Figure 35). While I believe this an interesting scenario formed by multiple visual stimuli, for *A Blue Bridge* I wanted to collapse the elements into a single focal point. There is still the possibility of switching focus from the projection to the body in control and vice-versa, but they are in one place, partially fused. As for the commentaries, they are now made through the improvised part or the "imagination layer".

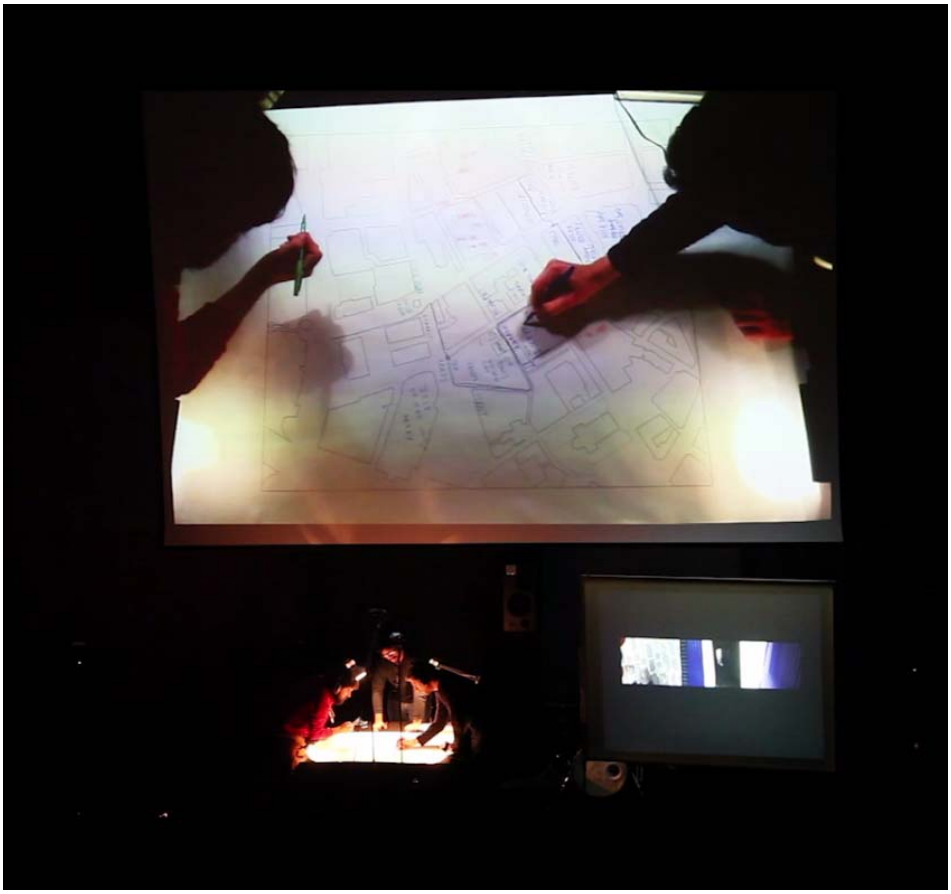

Figure 35: Come Across performance at Sonorities Festival 2013.

In *Lock 1 Memories*, the sounds from the mobile application are superimposed to the ones from the visible physical world around the listener. In a similar way, *A Blue Bridge* combines two layers of sound. The difference is that in *A Blue Bridge*, as a concert piece, both layers are recorded and edited media: one is in full synchronicity with the video and the other adding schizophonic, foreground sonic elements. In both pieces, a duality real world/personal commentary is established.

In *Sienkiewicz Pipes*, the listener navigates a virtual space by touching the control screen, bringing to the surface "hidden" potential sounds that are relocated to random dimensional coordinates every time the installation has its cycle reset. In *A Blue Bridge* there is also navigation through a virtual space; the performer has access to potential sounds that can be found by tilting the control sphere and changing its azimuth angle. The "hidden" sounds are placed "around" the performer and the audience, in the elevated octophonic array of speakers.

The physical bridge over the River Lagan offers a straightforward macro structure to the piece: there is an introductory moment on the west side, then the crossing and it ends suddenly on the east side. At the beginning of the piece, the quick panning of the camera to the left and then to the right side is meant to reveal to the audience the surroundings, the space in which the soundwalk happens. It does not mean that the audience will or should be able to recognise the specific location or even recognise the city of Belfast. It is just enough to convey the general characteristics of the space, to establish a basic context or framing. In fact, the visual elements are supposed to be much less ambiguous than the sound. There are distortions, more evidently the ones caused by my presence in front of the white screen and the editing cuts, but, even when switching between different times of the day, the video has a strong sense of continuity and homogeneity.
The sound composition, on the other hand, is rather complex. When reconstructing the stereo recordings to an 8-channel configuration, I was careful to keep the main original directionality of the most prominent sound sources. This real world referentiality is barely disturbed during the first half of the piece until I intensify the sonic commentaries and visual distortions.

A Blue Bridge presents a recreation of the *personal sonic space* of the walker through representational devices (video projection and spatialised sound). The decision to have a live component for the performance of this piece, as opposed to a fixed scenario, was made initially to create an opportunity for me, as soundwalker, to re-enact the experience, tapping into my memories of place, focusing on the sound whilst the audience is able to accompany the route in a first-person perspective. This allows me, as the walker, to comment on the experience, presenting and unfolding the walk in a unique way as it progresses. This improvised component also provides me a challenge; I must focus, listen and, in a way, re-live experiences I had through this compacted, fragmented walk. The partial openness of such configuration contributes to a contextualised

improvisation scenario; I am familiar with the elements, I understand the interactive rules, but the indeterminacy and complexity factors lead to varied performances. One interesting thing I have noticed while rehearsing and performing the piece is that the combination of familiarity and indeterminacy results into a particular state of engagement in which time seems to pass in an accelerated pace.

When discussing the matter of sound diffusion in live electronic music, Emmerson suggests that "material related to local functions might be differentiated from that for field use and independently diffused appropriately in the performance space (2007, p. 97)". That is roughly what happens in *A Blue Bridge*, there is a spatialisation separation between the "real" layer, which has clearer field functions, and the "imagination" layer, which, with its foreground sound elements brought to surface by the performer, has functions that can be considered local. In *A Blue Bridge,* the line that separates both layers is intentionally blurry. The content and quality (heavily edited and processed) of the "imagination" layer presents a contrast, but it derives from field recordings made in the same place as the "real" layer - the footbridge. Therefore, while a contrast between both layers exists, there is also a sense of belonging. The transitions between layers, made with crossfades and frequency filters, are also intended to create a blurry threshold and keep a timbre and contextual connection. In the same context, Emmerson also comments on the difficulty of giving diffusion control to a live performer (Ibid.). I tend to agree; it can be rather challenging to include this kind of control as an additional task for a performer. In *A Blue Bridge*, the sound diffusion strategy is intentionally simple in its two levels of control. The performer has (1) precise control over the balance between "real" and "imagination" layers and (2) less precise, almost left to chance, control over the specific highlights that can surface from independent channels on the upper octophonic ring. Such simplicity allows the performer too concentrate on diffusion decisions and on the relatively slow development of the piece.

The performer's position in front of the projection screen aim: (a) to present to the audience a single visual focal point; the visual horizon is established by what the projection lights up; (b) to mark my presence as creator and commentator, partially reintroducing a bodily quality to the disembodied field recordings; (c) to create a dual scenario in which the performer and the video projection, potentially, alternate foreground and background positions.

The gestural expressivity is intentionally subtle and, while it aims to connect broad gestures with interferences on the audio and video developments, it avoids revealing details of the interactivity. The audience can see that the interface is being manipulated, but the absence of common devices such as buttons, strings, valves or rubber pads creates a veil of mystery. In a way, the subtlety of the mapping strategy is related to way I see my experience on the actual bridge. As a 'sonic hideout' that place represents a threshold between privacy and public. Standing there, in a public space, I can still engage in a process of listening that is unequivocally internal and personal. And it is a rather dynamic situation since I tend to go in and out of a feeling of immensity as I alternate between a broad listening and the acknowledgement of other people passing by. Such experience relates to Bachelard's conception of daydreaming:

> Daydream undoubtedly feeds on all kinds of sights, but through a sort of natural inclination, it contemplates grandeur. And this contemplation produces an attitude that is so special, an inner state that is so unlike any other, that the daydream transports the dreamer outside the immediate world to a world that bears the mark of infinity. (…) from the very first second, is an entirely constituted state. We do not see it start, and yet it always starts the same way, that is, it flees the object nearby and right away it is far off, elsewhere, in the space of elsewhere. (1994, pp. 183-184).

The dynamic changes between two contrasting sonic layers mimic this 'daydreaming' situation, in which the mind experiences images composed by a mixture of reminiscing and extensions of the current surrounding reality.

Looking at the bridge's physical configuration and position in more detail, one will notice that, being positioned near two curves of the River Lagan, its open side faces northwest, pointing directly at the heart of Belfast's city centre (Figure 36). This positioning is one of the reasons why the sounds that reach this footpath have such rich content.

Figure 36: Footbridge indicated in a fragment of a map of Belfast.

Another consequence of this configuration is that the further one goes on the bridge, from west to east, the more one can hear; there is an effective expansion of one's outer sonosphere (Hölzl 2003). This behaviour was symbolically mapped onto *A Blue Bridge's* structure; its sonic density increases as the re-constructed crossing progresses.

A Blue Bridge invites the listener to follow this crossing, its ambiguous transitions between the background rumble of the city and the personal sonic, dreamlike, highlights.

4 CONCLUSION

The previous chapter, the body of this commentary, chronologically introduced each piece of the portfolio, presenting their general idea; motivation and initial artistic concepts; the processes of composition/preparation; notes on their presentations and dedicated discussions. By choosing to present the detailed processes of how each piece was developed, from initial concepts to practical realisations, I hoped to reveal part of the compositional process and its expectations, issues, questions and decisions from a common perspective. This final chapter briefly makes some observations regarding the portfolio and points out a direction for future work.

My main goal was to compose a number of semi-open pieces that presented spatial references as part of their structural development and as elements that contributed to more intuitive fruition processes. This intuitiveness is related to the matter of accessibility as in Neuhaus' statement: "I'm not interested in making music exclusively for musicians or musically initiated audiences. I am interested in making music for people" (1994, p.34).

In the pursuit of such goals, the creative challenges introduced specific elements and strategies that spread from piece to piece in the portfolio. Relocation of sounds; multi-layered environmental sounds; the retracing of steps; remembering; the play between current and past (or 'real' and imagined) events are some of those elements that helped to shape and characterise the portfolio.

The varied presentation formats (Table 2) allowed me to explore these elements in different scenarios, reminding me of the importance of going from concept to practice. That is, during the realisation stage of each piece - when ideas were set

in motion, listening, testing and prototyping in various scenarios led me to a great number of insights about the works that would not have been possible otherwise.

Category / Piece	No chords attached	Come Across	Lock 1 memories	Sienkiewicz Pipes	Up the Hill	A blue bridge
General format	concert	concert	mobile application	installation	installation	concert
Sonic material	Environmental/ instrumental	Environmental	Environmental	Environmental/ synthesis	Environmental	Environmental
Spaces	Network Spatialisation Inside / outside	Map Multiple	(from) Physical to virtual (superimposition)	(from) Virtual to physical (extending)	Physical Relocation	Spatialisation Relocation
Visual components	Projection (text and pictures)	2 projections (map drawing; edited video)	Physical space Graphical user interface (GUI) / Map	Graphical user interface and light	Physical space	Video projection / interactive performance
Tech highlights	Network transmission / Multi-channel	Multi-channel	GPS triggered	Multi-channel Interactive	Multi-channel fixed	Multi-channel interactive
Site specificity	For a specific kind of space / Can be relocated	Site sympathetic / Can be relocated	Site specific	Non site specific / Place inspired	Site specific	Site sympathetic

Table 2: Summary of general characteristics of each piece.

Table 2 presents, in a summarised manner, differences and similarities among pieces. While this is a good resource to quickly visualise a great amount of information, it is interesting to make a few further commentaries. In the side-by-side comparison of Table 2, it is clear how diverse the use of space is in the portfolio. This is of great relevance for the research since, from the beginning, I proposed to develop works based on spatial referentiality. I would invariably have sound as primary motivation to explore a space. Each space led to the germinal compositional ideas. The consequent dialogue with their spatial qualities directed my artistic and technical decisions. I have tried exploit spatial qualities to structure the works as well as to leave representational clues for the fruition agents to read in their contact with each of the pieces. Focusing on the idea of open-form, the compositional process of each work was oriented toward enabling a potential fruition situation defined by a combination of fixed and undefined/ambiguous elements. Consequently, the decisions were also directed by the desire to present artistic experiences that allowed, in one way or another, the participation of the fruition agents. The varied performative strategies used were conceived to create opportunities for the agents to act and/or interpret the works according to their subjectivities. The articulation of physical and representational spaces serves as frame for such experiences. For each work I would always ask myself: "what is it there to hear and see?", "how are these elements interrelated?", "can the agents involved participate in the process somehow?", "how are the spatial features being highlighted?".

Most pieces, with the exception of *Up the Hill*, make use of extra visual elements to inform about the rules in play and to establish representational spatial framings. The visual in *No Chords Attached* and *Come Across*, for instance, indicate the multiple spaces in play and the spatial exploration of the performers. The fruition experiences in *Lock 1 Memories* and *Up the Hill* are centred on the physical space, which provides the necessary context and establish structural and action horizons. *Lock 1 Memories* depends on a GUI, but this element has a peripheral

function, it introduces the experience and can be used as reference; the physical space plays a dominant role in the fruition process. *Sienkiewicz Pipes* presents a contrasting strategy as it tries to supress the physical space by focusing on the abstraction erected by the combination of the touch-screen GUI, light and sound pulses. In *A Blue Bridge*, the visuals present a context and reinforce the notion of a re-lived walk, reaffirming the presence and point of view of the walker.

All those visual elements work toward the specific goal of delimiting and framing the artistic experiences. They reinforce a central characteristic of the portfolio; the importance of the use of sound in space(s). As discussed before, the portfolio values the origin, placement and directionality of the sounds; 'where the sound is' becomes an important element in play. In *No Chords Attached* there is an interplay of contrasting spaces (internal/external, stage/street) that dialogue and merge with the aid of complex spatialisation and streaming strategies mediated by a network. *Come Across* reveals a somewhat vast single space (a portion of an urban space) split in partial representations (individual soundwalks) that seek to express their idiosyncrasies and converge in a performance focused on reminiscing. *Lock 1 Memories* reveals a mediascape around the listener in an explorable open space; the sounds from the application, being dislocated in time not in space, act as voices from the past (and a possible future) commenting the place as the walk unfolds. *Sienkiewicz Pipes* proposes a more abstract experience, offering a 2D space representation that is extruded to the room around the listener through the synchronised light and sound pulses around the listener. In *Up the Hill* a reduction of a sound ecosystem is transposed to a much smaller physical space (Belfast Soundscape Park) that can be freely explored by the listener. *A Blue Bridge* proposes a performance/re-enactment of multiple soundwalks in one through spatialised sound. It presents a dual system that brings "real" and "imagined" sounds dynamically placed/revealed around the performer and the audience.

The matter of aiming at the collapse of time through the use of environmental sound and the possibility of non-linear readings was pursued in different ways in

the portfolio. In *No Chords Attached*, the changes in *space frames* and the dislocation of local and remote sounds calls for a spatial reading; *Come Across* and *Sienkiewicz Pipes*, in distinct ways, explore links between visual components and separate sound sources, in the attempt of creating a potential random access to sound according to the listener's focus; *Lock 1 Memories* and *Up the Hill* erect a complex sound projection in an explorable space, eliminating sequential elements altogether as the agents can move freely and listen *wherever* they want; *A Blue Bridge* uses a slow development in the environmental sound textures and a complex spatialisation scheme to move the focus of the experience to space rather than time.

The use of environmental sound in the portfolio implicates the inclusion of a complexity, of surrounding worlds populated by events that might resonate with one's personal constitution. In that sense, the way I conceive an external sonic environment is directed inward, toward individual subjectivities rather than outward as in the idea of *soundscape* proposed by discipline of acoustic ecology. I would like to highlight that I am not contrary to the ideals of acoustic ecology, neither am I against the idea of being closer to the environment around us, reflecting on social, ecological and health matters. Nevertheless, this research is focused on presenting sound initially in a creative, aesthetic context, hoping that its qualities and potential referential characteristics will resonate with the agents involved. So there is a clear intention of exploring a referentiality that is open to multiple interpretations. I believe that, to some degree, it is possible to listen to both sound as aesthetic object and as something that might connect us to different realities and contexts.

One might ask how can subjective reading and *fruition* apply to field recording, sonic fragments that carry such strong geo-temporal marks. I would argue that, even though field recording is inevitably connected to something that happened at some point in the past and it carries geo-temporal marks, it will never be able to completely represent reality, in a reflective/absolute manner. The recordings carry

meanings, aural complex images and cultural symbols that will be invariably re-interpreted in an infinite number of ways according to the subjectivities of the listeners and according to the articulation strategies used to connect the sonic excerpts to other signifiers. In addition, as mentioned earlier in a few occasions, field recordings carry a great deal of intentionality. By selecting, highlighting (synecdoche effect) and omitting elements (asyndeton effect) I present a transformed, partial and authorial construct in form of sound art. That is, the captured sounds have a strong referentiality, which help me to frame the aesthetical experiences maintaining a great openness potential.

At the beginning of the research, although I had the clear goal of developing semi-open spatially oriented pieces, I was not entirely sure as how to accomplish such goal. The practical work, supported by theoretical readings and reflections, was gradually developing itself towards the achievement of both my main artistic and research goals. During the work on the portfolio, I also gradually built a clearer perspective of how to relate physical and representational spaces, exploring different scenarios to enable a fruition experience in which space has a more prominent presence. In short, during 4 years, my practice fed back theoretical questions that gave something in return to the creative works. The result of this cyclic process is presented in the portfolio and discussed through this written commentary. My creative practice was improved by the knowledge and experience gathered from this research and, in a similar manner, I hope that the present work can positively contribute to other composer's reflections.

Collaborating with colleagues was another unforeseen element in my research. I did not have specific plans to include other people and/or accommodate other interests in my portfolio pieces. Nevertheless, I was glad to find a group of people with common (or tangential) interests and with good disposition to develop projects together. In general terms, I consider these collaborations I had during the research, including the ones that did not contribute directly to the portfolio, positive in 2 main manners, (1) They helped to get integrated to SARC's activities

and (2) they were a constant source of new information, fresh perspectives and critical considerations regarding both artistic and scientific practice.

Lock 1 Memories and Up the Hill are pieces in the portfolio that were developed within larger projects, respectively 'Belfast Soundwalks' and 'Belfast Soundscape Park'. One interesting aspect of taking part of such projects was to be able to have my sonic commentaries, as someone that comes from a distant country, among several other works from local and non-local artists. As both projects focused on providing alternative ways to listen and understand the city of Belfast, they also expected diverse outcomes to arise from the works. Consequently, such diversity empowered the artists, while engaged in a common goal of interacting and exploring Belfast, with artistic freedom in their individual approaches.

Regarding future work, I have interest in exploring creative possibilities of virtual reality technologies to setup immersive fruition scenarios. I believe virtual reality can be a fruitful tool to explore spatially organised subjective experiences with focused listening, building on the ideas of dynamic space frames, multi-layered environmental sound, non-linear access to sound etc.
A practice-based experimental investigation focused on evaluating the perception of spatial references as framing resources in environmental sound based works could be an interesting extension of this research.
I am also interested in the question of how all the mediation strategies (relocations of sound in time and space and spatial representations) create a sense of, maybe, *dispersed liveness*, an uncertainty regarding where or when the performance is. I tend to see this in a positive way, as these mediated scenarios enable new ways of experiencing the world through artistic practice, shorting distances and bridging gaps between people and places, rather than having individualising/isolating effects. I believe this could be a promising starting point for related future investigations.

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