Control, collaboration and audience engagement in interactive sound installations

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Declaration of Authorship

I Lucy Ann Harrison hereby declare that this portfolio of sound installations and accompanying commentary are entirely my own work. Where I have consulted the work of others, this is always clearly stated.

Signed: ___*Lucy Harrison*_____ Date: __20 June 2018_____

Abstract

This portfolio of sound installations represents a period of development and investigation through three interactive works staged between 2013 and 2016. It looks at how to engage audiences with electronic soundscapes through interactive staging and the challenge of artistic control versus the benefits of collaboration. Collaboration is considered both from the perspective of working with other artists and designers as well as placing the audience in a collaborative role within the installations. This is balanced with the question of how the composer can retain control and ownership of the creative output when the level of interaction and collaboration is increased.

The sound within this portfolio has been influenced the work of Karlheinz Stockhausen, Delia Derbyshire and Trevor Wishart in its form and approach. These sound worlds have been combined with staging and audience engagement techniques currently being used in event art and immersive theatre by companies such as Daily tous les jours and Marshmallow Laser Feast.

Installation 1, *The Wind Singer*, is an interactive work for schools and educational events based on the book of the same name by William Nicholson. The installation investigates how to introduce school groups to new sound worlds through exploration and play.
Installation 2, *That I will do my best…*, is a work commissioned by national youth organisation Girlguiding. It demonstrates techniques for crowdsourcing material from the potential audience and building interaction that can be integrated into an exhibition style event.
Installation 3, *Let's build a fort!*, is the culmination of all the techniques developed within this portfolio. It includes elements of play, crowdsourced material and collaboration with other designers to create a fully interactive audience experience.

Acknowledgements

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Audience feedback data available on request to lucy@laharrisonmusic.co.uk

List of Works

The Wind Singer

First performance: Girlguiding, ICANDO, London, April 2013

Subsequent performance: All Hallows Catholic College, Macclesfield, July 2013

Soundscape, live electronics, synthesizer, recorders and brass band

Max 6, Sound Loom and Makey Makey

Duration of pre-composed material: 5 minutes 49 seconds

Duration of installation: 20 minutes

That I will do my best…

Alexandra Palace, London, 22-23 February 2014

Soundscape

Max 6, Sound Loom and Kinect for Xbox

Duration of pre-composed material: 17 minutes 55 seconds

Let's build a fort!

5th Base Gallery, London, 2-13 February 2016

Soundscape and live electronics

Max 6, Sound Loom, Xbox Kinect and Raspberry Pi

Duration of pre-composed material: 46 minutes 6 seconds

Illustrative materials on USB[1]

Folders are indicated in bold

Installation 1 The Wind Singer

1 Max Patch and External Objects

External Objects

analyzer~.help.pat

analyzer~.mxo

munger1~.help

munger1~.mxo

WindSinger_Patch.maxpat

2 Audio in patch

morah_mix_2.wav

morah.wav

windsinger_2.wav

windsinger_rev.wav

WindSingerwithoutvoice.wav

zars4rev.wav

zars4revm_pan3.wav

3 Audio and video examples

Echo.m4v

Granular_Synthesis_Example.wav

Pads.m4v

4 Source Material

recorder_source_air.wav

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[1] Illustrative materials are stored online at
https://www.dropbox.com/sh/5ba84okpbkc7h1l/AACMV7jzysP9K3yNWFhQrZMra?dl=0<https://www.dropbox.com/sh/5ba84okpbkc7h1l/AACMV7jzysP9K3yNWFhQrZMra?dl=0>

Installation 2 - That I will do my best

1 Max Patch and External Objects

External Objects

KVL_Kinect_Tracker_v20

That_I_Will_Do.maxpat

2 Audio in patch

Thinking_Day_Track1.wav

Thinking_Day_Track2.wav

Thinking_Day_Track3.wav

Thinking_Day_Track4.wav

Thinking_Day_Track5.wav

Thinking_Day_Track6.wav

Thinking_Day_Track7.wav

Thinking_Day_Track8.wav

Thinking_Day_Track9.wav

Thinking_Day_Track10.wav

3 Video and Audio examples

That_I_Will_Do_Complete.wav

ThatIWillDo_Example1.m4v

ThatIWillDo_Example2.m4v

4 Source Material

Bybrook_Promise.wav

Cheshire_Promise.mp3

Handforth_Promise_1.m4a

Handforth_Promise_2.m4a

Handforth_Promise_3.wav

Hyde_Promise.wav

Installation 3 - Lets Build a Fort

1 Max Patch and External Objects

External Objects

bonk~.maxhelp

bonk~.mxo

jg.spectdelay~.mxo

KVL_Kinect_Tracker_v20

munger1~.help

munger1~.mxo

Fort_patch_2.maxpat

2 Audio in patch

1 Fortal

computer_text0.wav

computer_text1.wav

computer_text2.wav

spaceship_text0.wav

spacey0.wav

spacey1.wav

spacey2.wav

time_travel0.wav

time_travel1.wav

time_travel2.wav

time_travel3.wav

2 Blanket Bastion

stories_text_1_ch1_test_1.wav

stories_text_1_ch1_test_2.wav

stories_text_1_ch1_test_4.wav

stories_text_1_ch1.wav

stories_text_1_ch2_test_1.wav

stories_text_1_ch2_test_2.wav

stories_text_1_ch2_test_4.wav

stories_text_1_ch2.wav

3 Cardboard Castle

Hopscotch

Recorder_cut_a.wav

Recorder_cut_b.wav

Recorder_cut_c.wav

Recorder_cut_d.wav

Recorder_cut_g.wav

Twister

Musicbox_1.wav

Musicbox_2.wav

Musicbox_3.wav

Musicbox_4.wav

Musicbox_5.wav

Musicbox_6.wav

Musicbox_7.wav

3 Audio and Video examples

1 Blanket Bastion

Blankets_soundscape.wav

Blankets_Strobing_Example1.wav

Blankets_Strobing_Example2.wav

2 Cardboard Castle

Hopscotch.mp4

Twister.mp4

3 Pillow Palace

pillows_Example1.wav

pillows_Example2.wav

pillows_Example3.wav

4 Single Stronghold

Pages.wav

4 Source material

1 Fortal

Dog_shake.wav

keys_m_cut.wav

2 Blanket Bastion

and_they_all_cut_1_m_n.wav

3 Single Stronghold

pages_cut0_n_cut.wav

pages_cut1_n_cut.wav

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Introduction

This portfolio of sound installations represents an evolving approach to audience engagement and collaboration within interactive sound installations. It looks at how to include audiences in the development of sound installations, the challenges of building interaction into a project in a way that supports the work and the question of control versus collaboration in the creative process.

Central to the portfolio is a question about widening participation and audience engagement within my work. I will consider audience needs, experiences and expectations. This will move my soundscapes away from a concert hall setting, to be placed in interactive sound installations created with the audience at the centre of the choice of theme, interface and location. I aim to give audience members control over their listening experience by building interfaces that will enable them to interact with and explore the sounds of the installations making them collaborators in the work. These techniques will be explored through three interactive sound installations for three distinct audience groups. I will also investigate the importance of control within my sound installations. I will consider the importance of having complete control over the sonic output compared with the benefits of giving more control to interactive processes and audience engagement. This will be shown through the development of sonic material and the staging of the works. In addition, this question of control will be considered in relation to additional artistic collaborators within the design of the installations. I will consider how I can work with others artists and how this benefits the final work being created.

The first installation, *The Wind Singer*, is an educational piece for schools. It was created to introduce pupils to electronic music and uses notated scoring to bridge their understanding between the music that they learn through the national curriculum and the sounds within the installation. It addresses the challenge of engaging an audience that has not been given a choice about attending. *That I will do my best…,* the second installation in the portfolio, was created as part of an exhibition style event for Girlguiding, a leading youth organisation. This

installation looks at techniques to build on community participation and engagement by using shared experiences, the promise that all members make, as the basis for the work. The final installation, *Let's build a fort!* looks at techniques to engage audience members within a crowded events art market that includes immersive theatre and cinema experiences, by creating a user led experience and opportunities to play that can be shared with fellow audience members.

The portfolio shows a clear development of techniques throughout all three installations concluding with *Let's build a fort!* which addresses challenges of form and interface identified through the first two installations.

Installation staging

I began working with sound installations during my Masters studies in 2012. I had been creating instrumental music and electronic soundscapes presented in a concert format. However, I felt like my work was not benefitting from these performances; the presentation was too linear and felt like I was prescribing how the audience were supposed to act during the work. I was asking for them to sit silently in contemplation when I wanted to give them an active role. I liked the option that electronic soundscapes gave me to build new sound worlds but I felt like I wasn't letting the audience experience these new worlds in a creative way.

Concert performances of my soundscapes provided me with two main staging options. The first was to project an image or film to accompany the soundscapes; this ran the risk of providing an interpretation of the soundscape that was different to my intention for the work. The second option was to dim the lights in the concert hall so that audience members could fully concentrate on the sound being played. This option could leave audience members feeling as if they did not need to be in a concert setting to experience the work, and could have had the same experience while listening at home through good quality speakers. In addition they would have no place to focus their attention, as they would during an orchestral concert where they could watch the performer's gestures. Finally the audience

would have no control over their experience, as audience members would not be able to leave the concert hall without disrupting the performance. This question of audience role and experience is by no means new in art or music, in *Artificial Hells* Claire Bishop uses the example of Futurist art and theatre stating that this is where the 'active/passive binary' discussion of audience roles in the 20th Century art began to develop.[2] Bishop also raises the question of the class based connotations around active and passive audience roles, when music hall and pantomime performances have always had active role for the audience it seems that only some art forms rely on this perceived binary.

In 2009 Artichoke, a charity that works to produce large-scale events in public spaces, began to develop their Lumiere festival Durham[3] that featured a range of light and sound installations. The festival felt like an escape. The city still existed in the same form, but it allowed for the audience to view it differently, through the addition of the installations in every road and alleyway. There were no pre-determined expectations of behaviours, as there are with concert performances, or gallery exhibitions; the festival allowed for the audience member role to develop further not to a fully active participant but to take a more active role than they would in a gallery. During this time I had also begun experimenting with some basic coding and Max MSP. Max gave me the opportunity to add interaction into my work, and to move it away from what felt like linear constraints. It was through these two developments that I began to develop installation staging for my work.

Placing soundscapes within installations, in contrast to a concert hall, provides me with the option to give audience members control over their listening experience, letting them decide how they engage with the art and how long they experience the performance for.
This approach to audience control has been investigated by a number of prominent composers and sound artists. For example, Mira Calix's 2016 installation *Moving Museum*

[2] Claire Bishop, *Artificial Hells: Participatory Art and the Politics of Spectatorship* (London: Verso, 2012) page 44.

[3] Artichoke, 'Lumiere' (Durham) <https://www.artichoke.uk.com/project-category/project/> [accessed 10 June 2018].

35,[4] a sound installation created in collaboration with students from Nanjing University of the Arts. 21 soundscapes were created in response to pieces of contemporary visual art and placed within a bus that travelled around the city. This provided the opportunity for audience members to hear small snippets of the sound work during their day's travel. It also gave them the opportunity to exit the installation, allowing for them to control their own experience. Similarly sound artist Susan Philipsz creates site-specific installations where the sound helps the audience members to explore the architecture of public spaces. Philipsz's work focuses on voice within an installation setting, including her 2010 Turner Prize winning installation *Lowlands*, which uses 16th century Scottish folk songs originally installed underneath bridges in Glasgow.[5] Trevor Wishart created an installation based on his sonic opera *Encounters in the Republic of Heaven* for Durham Botanical Gardens in 2012.[6] This offered audience members the opportunity to hear the interviews and soundscapes featured in the sonic opera in a less formal setting that would be more accessible to family audiences. Further to this, the composer Anders Lind has used interactive installations as a means of collecting material for new works. 'Voice Harvester' was an installation created at part of *Voices of Umeå*, a suite of interactive compositions for processed voices.[7] The 'Voice Harvester' consists of three microphone inputs, linked to three speakers which output processed sounds. These speaker are filled with coloured materials (glitter, liquid and powder paint) so that audience members can see a physical effect linked to their sound. This encourages them to make more sounds into the speaker, which are recorded for the composer to use as source material for other compositions within the suite. However, these examples also put the public in a traditional audience role within the new setting. With the exception of Lind, there is limited interaction with the work, meaning that the audience can explore how the sound changes in different locations but do not have any direct control over the changes in the soundscapes. Lind's work includes interaction to increase engagement with work that will be staged in a traditional concert format. My installations within this portfolio will build on these staging techniques,

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[4] Mira Calix, 'The Moving Museum 35' (Nanjing, 2016).

[5] Susan Philipsz, 'Lowlands' (Glasgow: Glasgow International Festival of Visual Art, 2008).

[6] Trevor Wishart, 'Encounters in the Republic of Heaven' (Durham: Musicon, Durham University, 2012).

[7] Anders Lind, 'Voices of Umeå: The Voice Harvester' (Umeå: Umeå University, 2014).

while further incorporating interaction to encourage the audience to explore and play with the sounds.

Successful interaction and audience engagement can be demonstrated by the growing trend of event arts as demonstrated by companies like Secret Cinema, who create immersive film watching experiences such as their screening of The Empire Strikes Back which was in the UK Box Office Top 10 films throughout Summer 2015[8]; although it should be noted that their presence was skewed by the high price of event tickets. A reason for this success is that it responds to increased access to good quality technology within the home. If a person wants to watch a film, they can access it from On Demand service such as Netflix and watch it on a large, good quality screen with surround sound. This decreases the need to attend the cinema and is similar to the challenges faced by electronic music, as potential audience members could get the same experience by staying at home and listening on good quality speakers. Secret Cinema offers the opportunity to watch a film that audience members may have already seen, but with an added immersive, shared experience with other audience members meaning that there is a reason for audience members to pay for a ticket and attend. They are paying for something that cannot be achieved at home. By directly applying this technique where I create the need to physically attend to fully appreciate the soundscapes I will address the earlier challenges that I have faced around concert performance. This staging means that a presentation is needed and that the audience become integral to the work.

In addition, I will allow audience members to feel more able to explore sounds, but also to leave if they are finding sounds uncomfortable so that they do not feel trapped within a performance. An example of staging that allows the audience to explore the sound is the installation *Forest* by Marshmallow Laser Feast,[9] which was displayed in Bloomberg SPACE in London, as part of the Barbican's Digital Revolution festival in 2014. The installation was placed in a completely darkened room and consisted of a forest of metal 'trees' and lasers

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[8] BFI, 'Weekend Box Office Figures' <http://www.bfi.org.uk/education-research/film-industry-statistics-research/weekend-box-office-figures> [accessed 4 June 2018].

[9] Marshmallow Laser Feast, 'Forest' (Digital Revolution, London: Barbican Centre, 2013).

attached to accelerometers. Each laser played a separate note when moved. Audience

members were able to work together to build up chords, or could move around the space

experimenting with discovering notes and seeing how the sound changed throughout the

space. The success of this installation was that the interaction was instant; a note was played

as soon as the trees were moved, allowing for audience members to be able to hear the

effect they had on the sound. The interaction was also as effective with one audience

member as it was with larger groups, as the notes of the trees had been chosen to create

consonant chords.

Although including interaction within installations provides a useful interface for the audience

to explore soundscapes, there are some additional challenges to consider. Interaction can

reach a saturation point of people, where the interaction is unable to cope leading to no

changes in sound or cause the installation to crash. For example *Dune* a sound and light

installation by *Studio Roosegaarde*, features shrub-like objects that react to changes in

movement and sound around them.[10] In 2009, as part of the first *Lumiere Durham* festival,

Dune was installed in Durham Cathedral Cloisters. The large number of visitors to the festival

meant that, although still an effective installation within the space, there was little change in

sound or light. One solution to this is to stagger entry to the installation, to cap the audience

numbers and start a queuing system. This is similar to the approach taken by the Barbican for

Random International's *Rain Room* in 2013,[11] an installation where falling rain responded to

audience members' movements allowing them to walk through a downpour of rain while

staying dry. On 2 March 2013, the queue for *Rain Room* stood at 8 hours.[12] However, if

made to queue for a long time without any additional artwork to focus on, audience members

may lose interest and leave without seeing the installation. Another option is to consider the

number of potential audience members when designing the interaction for the installation so

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[10] Studio Roosegaarde, 'Dune' (Lumiere, Durham: Artichoke, 2009).

[11] Random International, 'Rain Room' (London: Barbican Centre, 2013).

[12] Barbican, 'Rain Room Press Release', 2013
<https://web.archive.org/web/20170325011027/http://www.barbican.org.uk/news/artformnews/art/visual-art-2012-random-internati> [accessed 6 June 2018].

that this can be incorporated into the initial design and create smaller points of interaction within the work so multiple audience members can interact with different parts of the work simultaneously. This is the technique used in *Assemblance* by Umbrellium, an installation where audience members can interact with different 3D light structures to produce visual and sonic results. Some of these structures work individually while others can be explored collaboratively with other audience members.[13]

Through the installations in this portfolio I will also consider how audience members will interact with the work. If the work is being places in a public location, such as a gallery or as part of an event, audience members may not all know each other. For example *danceroom Spectroscopy*, an interactive sound installation created to demonstrate nano-quantum worlds installed at the Barbican Weekender in 2013, has gesture-based interaction.[14] The functions of the interaction increase if audience members work together to create larger scale gesture. However, at the Barbican Weekender the majority of the audience members did not know each other and were reluctant to work together, meaning that some of that functionality was lost. This is an important consideration when creating interaction in work.

Audience engagement

As a composer I have become increasingly concerned about access to the arts becoming more limited due to changes in government policy and funding; care has been taken throughout this portfolio to ensure accessibility. I feel very strongly that art is not fulfilling its purpose if we limit audience access. By limiting access to the arts we are reducing the number of different voices, backgrounds and opinions of the people creating art and music. This means fewer voices questioning the status quo and political landscape, and fewer challenges to accepted ways of working. Although, as Bishop acknowledges in *Artificial Hells*, this dismantling of access to the arts has been on-going throughout the 20th and 21st century. She outlines in relation to community art a common tale of decreased funding through the 80s

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[13] Umbrellium, 'Assemblance' (London: Barbican Centre, 2016).

[14] D.R. Glowacki and others, 'Danceroom Spectroscopy' (London, 2012)

and 90s that led to the deconstruction of community arts funding under Thatcher[15] and the appropriation of the form under New Labour to be used as a tool to prevent 'social exclusion'.[16] Having been through a non-selective state school system I have seen a number of peers, with the same amount of potential talent within music, not be given the opportunity to study music at a high level and lose interest in attending music events. With music taking a reduced role in the National Curriculum[17] the access for students who cannot afford supplementary instrument lessons will also be reduced creating a pipeline problem for musicians from varied backgrounds and experiences.

While the Curriculum and access to private music lessons is a considerable barrier to access and inclusion, through my professional experience working in equality, diversity and inclusion within the charity sector I have become aware that a large barrier is people not believing that an organisation or activity is for people 'like them'. If they don't feel welcome, and don't see people like them accessing the work then they are unlikely to take the risk of taking part. I have attended classical music events where audience members, including those attending with me, have been made to feel that they were not welcome or didn't fit with the audience demographics by clapping between movements or not having the accepted language to describe a musical work or performance. It is understandable that audiences police behaviour and ritual within concert halls as this increases their sense of community and belonging within an organisation. As Christopher Small writes in Musicking:

> …rituals large and small are patterns of gesture by means of which people articulate
> their concepts of how their world are structured, and thus of how humans ought to
> relate to one another. Such ideas held in common about how people ought to relate
> to one another, of course, define a community, so rituals are used both as an act of
> affirmation of community ("This is who we are"), as an act of exploration (to try on

[15] Claire Bishop, page 187.

[16] Claire Bishop, page 13.

[17] Ally Daubney and Duncan Mackrill, 'Changes in Secondary Music Curriculum Provision over Time 2012-16', *ISM*, 2017 <https://www.ism.org/images/files/Changes-in-Secondary-Music-Curriculum-Provision-2012-16_Summary-final.pdf> [accessed 4 June 2018].

identities to see who we think we are), and as an act of celebration (to rejoice in the knowledge of an identity not only possessed but also share with others).[18]

Beyond interest in the music, the audience is invested in maintaining the rituals associated with the performance. It makes them feel safe and included within a community. However, by maintaining this safe community for themselves they create a hostile environment for others. An environment where a lack of understanding of rituals will make them stand out as a person who doesn't belong in, or understand the concert environment. For me, it seems, that the way to address this closed audience community for my work is to remove it from the concert hall environment to an interactive space where the ritualisation of audience behaviours is slightly more fluid. It is my goal as a composer that audiences are given the opportunity to feel welcome attending my work, and not feel like there is an accepted way to engage with the sound and installations. Within this portfolio I aim create an informal and welcoming atmosphere for audiences experiencing the installations, to remove expectations around listening behaviours and the need to listen in the 'right' way. By aiming for an inclusive atmosphere my hope is that audience members of all ages and backgrounds will see my work as being 'for them', and that they would consider attending similar installations in the future.

Research addressing audience engagement, specifically within music is Melissa C. Dobson's research into the experience of Culturally Aware Non-Attenders at live orchestral events[19] comparing audience experiences across three concerts in London. Two of these did not have a pre-concert introduction, while one did. Dobson concludes that audience members do benefit from having information before a concert to help them understand and appreciate the programme. She does suggest that this is needed more to give audience members the confidence to trust their judgement about the music:

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[18] Christopher Small, *Musicking: The Meanings of Performance and Listening* (Middletown: Wesleyan University Press, 1998) p. 95.

[19] Melissa C. Dobson, 'New Audiences for Classical Music: The Experiences of Non-Attenders at Live Orchestral Concerts', *Journal of New Music Research*, 39.2 (2010), 111–24.

This perception of classical music was reinforced by audience behaviour, especially the standing ovation the participants witnessed in Concert 1, which made many doubt their own ability to 'appreciate' the music.[20]

The Southbank Centre, in London, in particular, often includes pre-concert talks to help engage new audiences with a variety of styles of music. For example in 2013 as part of their *Rest Is Noise* festival based on the Alex Ross book about twentieth century music,[21] Southbank Centre ran a number of Weekend events including lectures and workshops about the works being featured and their historical contexts. These included panel discussions, film showings, free concerts and workshops.[22] The challenge with using a pre-concert talk, or information, is that it relies on people having made an initial choice to attend a concert. They may increase the audience's enjoyment during the concert, and make them more likely to return but it cannot change the initial choice that the audience has made about whether they would like to attend the concert. By moving the work away from a concert hall setting to be placed within sound installations I will provide an effective contrast to the need for pre-concert talks. This will remove the expected audience behaviours that come from the concert hall tradition and comparisons with other audience members.

By being able to explore the sound-worlds through the interactive installations, audience members will regain control of their experience and be able to create their own methods for exploration and listening. This technique has been explored by a number of organisations, for example as part of its audience outreach work in South West England in 2014 and 2015 the Philharmonia launched a touring *iOrchestra*, which included 'Universe of Sound' an installation that allowed audience members to experience how the sound of the orchestra changes from the perspective of the performers. This was part of wider audience outreach

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[20] Dobson.p. 122

[21] Alex Ross, *The Rest Is Noise: Listening to the Twentieth Century*, 2009 edn (London: Harper Perennial, 2009).

[22] Southbank Centre, 'The Rest Is Noise' (London, 2013).

work which included instrument 'Musiclab' lessons and resources and training for classroom teachers. In their evaluation they reported that:

> Only 13% of visitors to Universe of Sound had ever attended an orchestral concert before, whereas 67% of the final concert audience attended as a direct result of their visit to Universe of Sound.[23]

This installation was effective as it gave audience members control over their own experience and a chance to explore an orchestra in a way that they cannot during a concert performance. It de-mystified the concert going experience and explained in a clear and accessible way what audience members can expect during a classical music concert.

Encouraging interaction and play in my work is central to engaging audience members with the sound worlds. By asking the audience to play and interact with the work, it moves the sound world away from the formality of a concert or gallery setting and allows for them to have control over their own experience. This integration of play builds on techniques by Daily Tous Les Jours, a company based in Montreal, Canada. In *21 Balançoires (21 Swings)* they explore the concept of cooperation using playground swings.[24] Each swing in a line produces a different melodic pattern. When working together to coordinate their swings members of the public can produce different melodic results. The strength of this work is the interface that invites the audience to play with the work. The audience already know how to interact with swings, based on shared childhood experiences. This interface reminds the audience of their childhood need to play and experiment. The need to have multiple simultaneous users encourages people to interact with other members of the public. The influence of *21 Balançoires (21 Swings)* is most obvious in *Let's Build a Fort!* where I included childhood games, such as hopscotch, and building materials to encourage audience members to build

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[23] Philharmonia Orchestra, 'IOrchestra: Review & Evaluation', 2016 <http://www.philharmonia.co.uk/assets/files/3899/iorchestra_evaluation_report.pdf> [accessed 4 June 2018].

[24] Daily tous les jours, '21 Balançoires' (Montréal, 2011).

and play together. The influence can also be seen in *The Wind Singer* where the stepping-stones are mapped to different notes.

Audience centred design

To ensure that I meet my compositional aim of creating inclusive and welcoming experiences for my audiences it is important that I create the work with the audience at the centre throughout. With all my projects I work to a brief, created by myself or given to me by a client. There are two stages to my compositional process. I start by creating a project brief that outlines the installation, everything that the work should be (for example if a high level of interaction is expected, or if it has an educational function), and other considerations that need to be taken into account such as the budget. I take time during this development stage of the process to create an expected audience profile. This helps me to understand the audience's needs and expectations when developing the interface for the installation and the soundscapes.

This includes:

- Who are the audience? Their age, profession and where they are based.
- What art do they regularly attend?
- Why do they attend arts events?
- What other media do they regularly consume?

These audience profiles also helps me to choose areas of popular culture to use as a stimulus for the work in this portfolio. If working with an external organisation or venue, such as a school, I then combine this audience profile with the organisation expectations this will include the length of installation, structure and the organisational aims. Based on this profile for the audience and venue I then decide on a theme for the installation. I look for a theme that will draw potential audiences into the work, and provide a structure for the interaction, for example a story, or a shared experience. For 'The Wind Singer' this was a book that school

pupils would be able to access in their local library, for 'That I Will Do My Best…' this theme was the promise that all members of Girlguiding make when they join the organisation. The theme provides a structure for the installation and helps limit the possible options for the sounds and interaction within the installation. In addition, I use the theme as a basis for the source material used in the installation. This provides an added layer of meaning for the sound within the installation, which can provide additional interest for audience members.

After I have created the brief I begin to design the audience experience for the installation. For this I ask:

- How do I want the audience to think, feel and react to the installation?
- How structured will the installation be? Will audience members have to follow a process and path or will they have more freedom?
- How will audience members interact with the work?
- How will I evaluate the success of the installation?

This helps for me to structure the amount of material that is needed for the installation, for example if the audience is able to follow multiple paths then more material will be needed that if the installation is more structured. It also helps me to plan the interface for the installation that will facilitate the interaction of the work.

Control versus collaboration

A central question within the development of each installation within this portfolio was how much creative control I would have as a composer over the finished sound of the work. As I work with electronic soundscapes my instinct has always been to control every element of the work ranging from the soundscapes, all elements of the interface and how the audience is expected to interact. In my earlier compositional work, I saw complete control over the finished product as a benefit to working with electronic soundscapes. No element of the work was handed over to a performer, or was interpreted by a conductor meaning that the

audience heard the work in the exact way that I, as the composer, intended. As I have developed my compositional approach I have begun to see the limitations of this control. As there were no variations between each performance I felt that there was some excitement missing from the performance process, and a question developed about whether I should be having works performed within a concert at all, beyond this being the expected way for me to present my composition. When I attended arts events such as Lumiere Durham, interactive science museums, or large community events like Bonfire Night I saw audiences and community groups who were excited about the work that they were seeing, they were able to engage with the work in the way that best suited them, without being told by a curator or artist that they were doing it wrong. In order to engage with the audiences that I wanted to attract, I needed to increase the interactivity of the work, and release some control over the sound and structure of my pieces. By including interaction within an installation, it is vital that interaction actually contributes to the audience's experience and the sounds that they hear otherwise the interaction may just seem like a gimmick to audience members. For example in Radiohead's 2014 PolyFauna app[25] the user is able to explore landscapes on a smartphone, or tablet that play soundscapes created by Radiohead. However, the exploration by the user does not affect the sound being played meaning that there is very little need for interaction to be included within the app. By limiting the scope of the interaction within the work the composer effectively prioritises the completeness of their musical sound over the audience experience. This is best related to the Sherry Arnstein's architectural theory of The Ladder of Citizen Participation[26], which moves from traditional audience roles where they are informed or consulted up to the higher levels of participation of delegated power and citizen control. As Claire Bishop summarises in *Artificial Hells*:

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[25] Radiohead, 'Polyfauna' (Universal Everything, 2014) <https://itunes.apple.com/gb/app/polyfauna/id793263070?mt=8> [accessed 4 June 2018].

[26] Sherry R. Arnstein, 'A Ladder of Citizen Participation', *Journal of the American Institute of Planners*, 35.4 (1969), 216–24.

> The fact that the Ladder of Participation culminates in 'citizen control' is worth recalling here. At a certain point, art has to hand over to other institutions if social change is to be achieved.[27]

While Bishop's conclusion has been written with art that has a political objective in mind, it can equally be applied to the soundscapes in this portfolio and the interactive works described above. In order for them to achieve their full artistic aim, control needs to be handed over to the audience; however, how much control is the choice of the artist.

Giving up more control to the audience creates a question of ownership over the final work and the sound produced. If the audience are responsible for all the sound created, can I fully claim control over all the outcomes that the audience produces? This is similar to the challenges that can arise from open and improvisatory composition, such as text pieces and graphic scores. Rather than claiming full ownership over any work that the audience helps produce, I would prefer to consider this work a long distance collaboration. I have provided the tools that help the audience to complete the sound for the work in a way that they see fit. In order to retain some authorial control, interactive processes are limited in the number of outcomes that they would produce – within the programming for the work I have specified tonality or textures that the interaction will produce, ensuring that the sound within the installation remains consistent for each audience member within the installation while allowing for their own variations and interpretations of the work. I would suggest that, using the Ladder of Citizen Participation as a framework, this would put the work in this portfolio as 'delegated power'. The audience is not in complete control, but makes decisions in lieu of the composer.

As this portfolio progresses I move from prescriptive interaction, as seen in *The Wind Singer*, to giving the audience complete freedom (*That I will do my best…*) arriving at a compromise for the final work, *Let's Build a Fort!*, where audiences are given suggested interactions with the installation but are free to interact in a different way without it negatively impacting their

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[27] Claire Bishop, *Artificial Hells: Participatory Art and the Politics of Spectatorship* (London: Verso, 2012) page 283

experience of the installation. Similarly the sound within the portfolio moves from controlled, with some interactive elements, to a completely composed soundscape (*That I will do my best…*) to finding a compositional compromise in the final installation, where the sound is a combination of live processing and pre-composed soundscapes.

An additional challenge of increased interaction is that the work can lose its sound and structure. If every part of the work is interactive then the sound created is no longer the focus, the focus becomes the actions that the audience are making or the design of the work. This creates a work that is fun to interact with, but sounds disorganised. While I am looking for increased engagement in my work, it is also important that this work does still sound like my creations – this means finding a balance between creatively giving some control to the audience while creating a work that is musically cohesive. To facilitate this balance I design all the sounds within the installations as one cohesive piece of work, building from an initial complete soundscape and ensuring that all interactive elements build and blend together. This means limiting the options available from the interactions within the work, for example when live processing is used I work with processes that take in sounds from throughout the installation, building a complete sonic picture for the live processing. Randomly triggered sounds are built within a soundscape and split into smaller chunks and notes used within the installations are limited to chords that fit with the entire soundscapes.

Soundscapes

The biggest influence on my soundscapes is the work of Delia Derbyshire during her time with the BBC Radiophonic Workshop. This has stemmed from my interest in 1960s sci-fi television, mainly the early Doctor Who series and the sound design for The Prisoner where the sound helped bridge gaps in budget and visual effects. Derbyshire's influence can be heard most clearly in my approach to abstract sounds as source material.

air-raid sirens: that's a sound you hear and you don't know the source of as a young child... then the sound of the "all clear" - that was electronic music. I mentioned the Catholic bit: I was taken to benediction as a child and it was all in Latin -plain song hymns in an abstract language. After the worst blitz I was shifted to Preston, where my parents came from. It's only today that I've realised that the sound of clogs on cobbles must have been such a big influence on me - that percussive sound of al the mill workers going to work at six o'clock in the morning.[28]

The found abstract sounds used as source material in my work are related to the subject of the installation, for example in *That I will do my best…* the source material is Girlguiding members saying their promise. This creates a thematic link for the audience that can be discovered in further investigation of the work, creating a second layer of interest and understanding. In practical terms, limiting the source material to options that are thematically linked to the work also helps for me to limit the options of sounds allowing me to take an economy of means approach to my compositional process. Aesthetically, limiting the source material means that I can be more creative with the choice of processes within Sound Loom and I am able spend more time experimenting with variations in processes.

My compositional process is led by the source sound. I begin by testing the sound in Sound Loom to see which processes work well with the source material. For example, if the source material has a pitched element I will look at transposition processes first to see how elements of the sound are exaggerated at different pitches. If the sound is percussive I may look at stacking to exaggerate the percussive element, or stretching the sounds to separate the percussive sound into different parts. I will aim for a general mood, or feeling for each soundscape but I will not fully know how that will sound until I have begun to generate material. This is because I have found that being too controlled about how I want the output of the processes to sound is limiting to the compositional process. It focuses the work too much on the output and ignores potential outcomes of being process led. For example, in *Let's build*

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[28] John Cavanagh, 'Delia Derbyshire: On Our Wavelength', *First Published in Boazine 7 (1998)* <http://www.delia-derbyshire.org/interview_boa.php> [accessed 4 June 2018].

a fort! during the experimentation phase working with speech, I discovered that I could create synthetic string sounds by using a combination of tuning and chorus filters. I had been aiming to create the sound of wind. After generating the material I categorise the sounds by timbre. For example, all the bell-like sounds or sounds that remind me of science-fiction will be placed together. This is done to help me with arranging the material into soundscapes.

Escapism is a central theme to my work, and working with electronic soundscapes allows me to create complete, immersive experiences that can create moments of escapism for audiences. This can be building the sonic worlds described in books, having sounds move through real and imagined sound-worlds or recreating feelings and sounds from childhood. I want my soundscapes to appear like a snapshot of time that the audience are spending in a world. This world existed before the audience appeared and will continue after they have left. The world is built up of ambient sounds manipulated in *Sound Loom* to create surreal and other-worldy landscapes. Adding beats and harmonic riffs to these sound worlds would encourage the audience to link the soundscapes to existing music that they know, would create expected harmonic progressions and suggests that the soundscape will have a clear finishing point. This is why, where possible, beats, harmonies and melodic riffs are avoided. The exception to this is *The Wind Singer*, which does contain melodic material. There are two reasons for this: firstly as The Wind Singer is a structured, task-based installation, I needed to created small sections of sound to encourage pupils to move on to the next task. Secondly, the book that the work was based on included descriptions of songs and melodies that I wanted to reflect in the work.

My techniques for arranging material have been influenced by Trevor Wishart's approach within his soundscapes. In an interview with Digicult Wishart said that:

> …clearly stating the principal materials is important for the listener in a context where a traditional musical language is not being used; establishing key moments or climaxes in the work; repetition and development, and recapitulation of materials, especially leading towards and away from these foci, and so on. Repetition and

(possibly transformed) recapitulation are especially important to the listener to chart a path through an extended musical form.[29]

This contrasts Pierre Schaeffer's acousmatic approach where the sound is intentionally separated from its source, as outlined in his writing on The Musical Object[30], where the resulting sounds should be heard without reference to the source material. In addition to helping the audience hear the source material in context of the work I find that transformations of the sound would seem more surreal to the audience if they have heard the original material that is was created from, allowing for further world building or alienation. There are times where I have chosen to conceal the source material for example in the Blanket Bastion section of *Let's build a fort!*, as I felt that it would distract from the tonal soundscape that I was creating. For the soundscapes where I have chosen to conceal the original source material I want the work to have two levels of impact and understanding. The first of initial impact, where the audience can appreciate the work at face value and a second layer of detail that can be discovered when interacting with the work over a greater length of time. This technique has been influenced by works such as *Crown of Light* by Projection Artist Ross Ashton, Musical Director Robert Ziegler and Sound Designer John Del'Nero, featured as part of the 2009, 2011 and 2013 Lumiere festivals.[31] The work projects the history of the City of Durham and Durham Cathedral on the side of the cathedral, accompanied by a multi-channel score. The work is initially striking because of the sheer scale of the projection on the side of Durham Cathedral but further detail and appreciation of the work can be gained by following the story given in the programme of Durham's history and the Lindisfarne gospels.

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[29] Matteo Milani, 'Trevor Wishart: Chemistry of Sound', *Digicult, Digimag*, 2009 <http://www.digicult.it/digimag/issue-041/trevor-wishart-chemistry-of-sound/> [accessed 4 June 2018].

[30] Pierre Schaeffer, *In Search of a Concrete Music*, trans. by John Dack and Christine North, 2012 edn (Oakland, California: University of California Press, 1952) Chapter 16.

[31] Ross Ashton, 'Crown of Light' (Lumiere, Durham: Artichoke, 2009).

The forms of my sound installations have been influenced by Stockhausen's use of moment form, as developed in *Kontakte*.[32] To give the audience control over their own experience, and how long they stayed in the installations, I needed a form that would ensure that audience members would have the same quality of experience if they stayed with the work for thirty seconds or if they stayed for 20 minutes. Stockhausen's moment form allowed me to do this, by giving each moment of the soundscapes equal importance to the one that came before and the moments following. *The Wind Singer* is the exception, as it does not use moment form. This is because it was an educational work and needed a more rigid structure it is, instead, a multi-movement work made up of small 'scenes' of sound.

I use popular culture in the development of my work as a tool for audience engagement. It is important to my work that I understand the audience and create a 'hook', a reason why the audience would initially be interested in engaging with the installation. By using a shared pop culture experience, I create an anchor-point for the audience, which is a point of comfort and safety. The audience are aware of the tropes that would sit alongside the familiar plot and characters and would be able to use these to decode the work further, for example, *Let's build a fort!* had an expected audience aged between twenty and thirty-five. I was wanting to create an experience that reminded them of their childhood, which included books from the 90s, memorabilia from TV shows such as Thunderbirds and sound effects from children's game-shows. The shared experience for this work was building forts and dens. It is, however, important that an audience member that does not share the same pop culture references can understand the work. These references should only act as creating a second layer of understanding to the audience.

Technology and audience interface

For manipulating pre-recorded material used in the soundscapes I use *Sound Loom*, the software developed by the Trevor Wishart.[33] Although there are more modern and intuitively

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[32] Karlheinz Stockhausen, 'Kontakte' (Wergo, 1964).

[33] Composers Desktop Project, 'Sound Loom' (Composers Desktop Project, 2000) <http://www.composersdesktop.com/index.html> [accessed 6 June 2018].

designed sound processing softwares available, such as IRCAM's AudioSculpt software, I find that Sound Loom best suits my compositional process as it doesn't rely on pre-set functions, and allows for bulk processing. At times when I have worked with other software I have felt limited in my compositional process by the pre-sets available. While generating sounds to be used within my work, I try a number of processes with varying parameters and settings. I like to have control over very small variations, as instinctively some sounds may be close to what I want but may need a slight change. This is where working with software that does not suggest pre-set functions suits my compositional process.

Most of the interaction within the portfolio is created using Max 6. I have chosen to use Max 6 over open-source alternatives, such as Pure Data, as I have found that it more stable software to work with. The installations in the portfolio are left running for periods of up to 12 hours and need to be equally reactive further into the day as they are when the exhibition opens. Working with Max, I have found that I can create the most stable systems. The only patch that crashed during opening hours was *Let's build a fort!,* where the ventilation for the computer had been blocked. The other patches ran without crashing.

The interface

For this portfolio the interface is the means by which the audience interacts with the work. This includes the staging of the work and the technology used to aid interaction. There were three main considerations when choosing technology for the interface. These were:

- The development costs
- The ease of development
- How the technology would encourage audience interaction

I chose to appropriate technologies from other industries, such as gaming or education, which offered a simple, economical solution for the development of work while encouraging audience interaction through the use of familiar technologies and household objects. Using gaming technologies is a cost-effective way of developing interactive sound installations. As

the gaming industry is a saturated market, games companies are constantly developing new and improved products to be able to compete. This in built obsolescence means that older gaming technology is readily available through second hand providers, such as eBay, making them a cost effective technology for experimentation. For example a Kinect, a 3D motion sensor for Xbox, can be bought second hand on eBay for £15.99[34] while an equivalent 3D motion sensor, not from the gaming industry by Asus, would cost £253.14.[35] In addition, sensors such as the Kinect are easily hacked and adapted to be compatible with Max MSP. Microsoft made a decision to keep the USB port for the Kinect for Xbox open to encourage use in academic research[36] while 90ui3-Wii remotes can be repurposed on a mac through the installation of an open source programme and the remapping of buttons.[37] These two technologies allow for the incorporation of gesture-based interaction into installations.

The Maker Movement, a worldwide movement of professional and amateur inventors, also provides interesting technologies for the use within interactive sound art. As technologies are developed outside of large organisations crowdfunding, where members of the public pledge money in exchange for rewards or pre-order of a product, can be used as an alternative source of funding. A successful example of this is the Makey Makey, an invention kit by Joy Labz that allows for anything to be turned into a mouse or keyboard, which raised $568,106 in

[34] Ebay, 'Kinect for Microsoft Xbox 360 - Sensor Bar Black', 2018 <https://www.ebay.co.uk/itm/Kinect-for-Microsoft-Xbox-360-Sensor-Bar-Black/291908576298?epid=2255463169&hash=item43f71b642a:g:6gkAAOSwezVWuwAZ> [accessed 4 June 2018].

[35] Ebay, 'Xtion2, 3d Sensor, 640 x 480 Depth Resolution, High Rgb Resolution, Low Power', 2018 <https://www.ebay.co.uk/itm/xtion2-3d-sensor-640-x-480-depth-resolution-high-rgb-resolution-low-power/332538626716?epid=20009693971&hash=item4d6cd8c29c:g:SvQAAOSwor1acYe8> [accessed 4 June 2018].

[36] Todd Bishop, 'Microsoft: Kinect Wasn't Hacked, USB Port Left Open "by Design"', *Puget Sound Business Journal*, 2010 <http://www.bizjournals.com/seattle/blog/techflash/2010/11/microsoft-kinect-not-hacked-left.html> [accessed 4 June 2018].

[37] Alexandr Serkov, 'Wjoy: Nintendo Wiimote Driver for Mac OS X' (GitHub, 2015) <https://github.com/alxn1/wjoy> [accessed 6 June 2018].

2012 through KickStarter.[38] The maker movement is seen as a community of developers; as Dale Dougherty writes:

> Today's makers enjoy a level of interconnectedness that has helped to build a movement out of what in the past would have been simply a series of microcommunities defined by a particular hobby or activity.[39]

This means that community support is readily available for technology through the maker community or via the inventors themselves. As individuals and not large corporations are developing the technology, the development budgets are likely to be smaller with a large amount of the costs being absorbed by the individual creating the product. This is reflected in the sales costs of products, for example the Makey Makey retails for $49.95[40], making it a cost effective way to purchase technology. Finally, the technology being developed is intended to be used by the wider maker community. This means that technology developed is open source and easily combined with other software.

For the installations within this portfolio, the most important function of the interface is that it will encourage the audience to interact with the sound. This means that it must be inviting to an audience and suggest modes of interaction. In their 2015 Gamer Demographics the Entertainment Software Association reported that 51% of U.S. households own a dedicated game console.[41] Gaming technologies being ubiquitous within households means that audience members are aware of how to interact with the technology- the technology is already placed within their home and used on a regular basis. In addition, users will feel less

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[38] Joylabz, 'MaKey MaKey: An Invention Kit for Everyone', *Kickstarter*, 2012 <https://www.kickstarter.com/projects/joylabz/makey-makey-an-invention-kit-for-everyone/description> [accessed 4 June 2018].

[39] Dale Dougherty, 'The Maker Movement', *Innovations*, 7.3 (2012), p.11

[40] Joylabz, 'Makey Makey Classic' <http://shop.makeymakey.com/products/makey-makey-kit> [accessed 4 June 2018].

[41] Entertainment Software Association, '2015 Sales, Demographic and Usage Data: Essential Facts About The Computer and Video Game Industry', 2015 <http://www.theesa.com/wp-content/uploads/2015/04/ESA-Essential-Facts-2015.pdf> [accessed 4 June 2018].

inhibited about interacting with the technology, again this is due to the familiarity of technologies that they have within their homes, and the composer has a range of existing gestures to base interaction around such as those used for existing games.

Throughout this portfolio I experiment with making all technology visible to audience members or hiding the technology completely, to see which facilitates greater interaction with the work. *The Wind Singer* was created for an educational setting so the technology was kept partially visible in order to encourage a discussion with pupils about how the sound was created and how the interactive technology worked. In *That I will do my best…* the technology was kept entirely visible, to encourage existing known forms of interaction with the Kinect. The unexpected result of this was young audience members taking over the technology to explore how the sensors worked. In *Let's build a fort!* the technology was kept hidden to make the installation immersive for the audience and to encourage exploration of the space and sounds.

The Wind Singer

Soundscape, live electronics, synthesizer, recorders and brass band

Max 6, Sound Loom and Makey Makey

Duration of pre-composed material: 5 minutes 49 seconds

Duration of installation: 20 minutes

First performance: Girlguiding, ICANDO, London, April 2013

Subsequent performance: All Hallows Catholic College, Macclesfield, July 2013

The Wind Singer is an interactive, immersive, sound installation based on the children's book of the same name by William Nicholson.[42] The installation is designed for schools and other educational settings. It was created to introduce school age children to sound processing and interactive technologies and was used to facilitate a conversation with pupils about the techniques and technologies involved so that they could consider how these could be used in their own creative work. I chose *The Wind Singer* as a basis for the installation as it is aimed at the 11+ youth market, is featured in most school libraries and sound is central to the plot allowing it to be readily adapted into a sound installation.

I tested the installation at two venues. The first was ICANDO, a Girlguiding activity centre based in London. The installation formed part of a Brownies Science Explorer weekend, for girls aged between 7 and 10. The second venue was All Hallows Catholic College in Macclesfied, Cheshire. Pupils from all years attended aged from 11 to 18.

The brief

When working with school groups there were a number of limiting factors that informed the compositional process. As I would be working with a non-selective school, pupils would come from a range of backgrounds, abilities and experiences. This meant that I could not assume

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[42] William Nicholson, *The Wind Singer* (London: Egmont UK Limited, 2000).

any prior knowledge about the arts beyond what was included in the national curriculum. In addition the pupils will not have chosen to attend the installation, this is a decision that the school or event coordinators have made on their behalf meaning that I could not guarantee that the young people would choose to cooperate with any tasks being given. I needed to make the initial sounds and interactions as engaging as possible by including some instant interaction tasks early in the installation. The installation needed to fit the structure and requirements of the school curriculums and environment. I held meetings with staff at both venues to establish the form that the work should take and any additional limitations of this being an educational work.

As agreed with the organisers at both venues, the work needed to be:

- a structured guided session. This was especially important for the school venue as it would be taking the place of a normally scheduled music lesson
- useable by half a standard state school class (approximately 15 students per session)
- 20 minutes in duration. This would allow for 2 groups to attend per lesson, with an additional 10 minutes discussion about how the work was made and would allow time to reset the installation and for the groups to change over.
- adaptable for different locations.

The ages attending the installation would span across three educational stages. The children attending the Brownie event would be Key Stage 2. At this stage music education focuses on staffed notation, appreciation and understanding of music from a range of traditions, building aural skills and beginning to compose through improvisation and increasing confidence with performance.[43] However, at Primary School age children may not be taught by a specialist music teacher, as confirmed by the Government Office for Standards in Education (Ofsted) in

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[43] Department for Education, 'Music Programmes of Study: Key Stages 1 and 2 National Curriculum in England', *Gov.Uk*, 2013, pp. 1–2 <https://www.gov.uk/government/publications/national-curriculum-in-england-music-programmes-of-study/national-curriculum-in-england-music-programmes-of-study> [accessed 4 June 2018].

their 2005/2008 evaluation of music in schools.[44] This would mean that the understanding of specialist musical terms, as well as the pieces studied by children in Key Stage 2 might vary between groups. In design terms it was important to keep specialist musical terms and knowledge to a minimum.

The pupils from All Hallows Catholic College would be from Key Stage 3, GSCE groups and A Level groups. It was agreed with the school that the installation would mainly be designed for the Key Stage 3 groups. The GCSE and A Level groups would be given the opportunity to extend the knowledge of their sessions by asking more in depth questions about the technology used and the compositional process to influence their compositional work. At Key Stage 3 pupils are expected to build on the skills developed at Key Stage 2, increasing their confidence of performing, composing and listening. They should begin to understand musical styles, structures and techniques. They will begin to incorporate music technology into their practices. The focus is still on staffed notation and tonality. They are expected to listen to a range of work from 'great composers and traditions'.[45] This will mean that pupils will be more used to, and comfortable with music that has a tonal centre and clear melodic material. I have used this tonal material as a bridging method to guide the pupils into soundscapes that have more challenging electronic material.

Responding to the source material

The book *The Wind Singer* is set in the fictional city of Aramanth, a city controlled by yearly exams that all citizens take. The results in these exams determine where people live, their standing in society, the jobs available to them and the colour of clothes that they can wear.

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[44] Ofsted, 'Making More of Music: An Evaluation of Music in Schools 2005/08', 2009 <http://dera.ioe.ac.uk/308/1/Making more of music.pdf (accessed 22 August 2016)> [accessed 4 June 2018].

[45] Department for Education, 'National Curriculum in England: Music Programmes of Study', *Gov.Uk*, 2013 <https://www.gov.uk/government/publications/national-curriculum-in-england-music-programmes-of-study/national-curriculum-in-england-music-programmes-of-study> [accessed 4 June 2018].

At the centre of the city is a large sculpture called The Wind Singer; local legend says The Wind Singer used to sing and will one day sing again. During the examination period Kestrel, the central character, rebels against the system of exams. She seeks refuge with the Mayor of the city who sends her on a quest to bring back the voice of the Wind Singer, which was taken by an evil being called The Morah, so the Wind Singer can sing again. The installation focuses on the central quest that Kestrel is sent on to bring back the voice of the Wind Singer starting with Kestrel's rebellion.

I chose 8 scenes for the installation:

- Chapter 3 - The sound of The Wind Singer, without its voice.
- Chapter 3 - Kestrel shouting through the Wind Singer
- Chapter 14 - The song of the mud people, a tribe that helps the children on their journey
- Chapter 14 - The desert storm
- Chapter 18 - The bridge across the ravine
- Chapter 20 - The voice of The Morah
- Chapter 21 - The music of The Zars, The Morah's army
- Chapter 24 - The song of the Wind Singer with its voice

To structure the installation I created a map outlining the quest and the route that students must take (Appendix A). Additional tasks were included on each point of the map, describing how they can interact with the work and what they must do to move to the next section. All interaction was facilitated using a combination of sound detection within Max 6 and a Makey Makey, an arduino based device that allows you to turn any object that conducts electricity into a switch.[46] I combined the Makey Makey with Max 6 by using the *Key* and *Keyup* objects to map if connections had been made or broken.
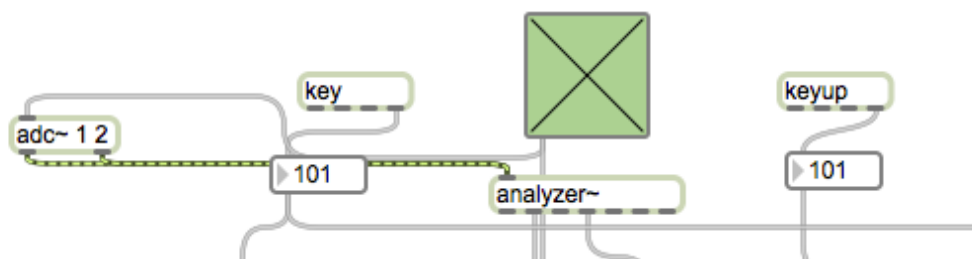
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[46] Joylabz, 'Makey Makey Classic'.

Figure 1 Makey Makey integration into Max 6

The sound development

The sound within the installation is a combination of pre-recorded electronics, live processing of sound within the space and notated composition. This is the only installation with notated material included. The notated section would act as a bridge between the music that pupils currently learn about in school, to more unfamiliar soundscapes. As pupils taking part in this sound installation would not have control over their own attendance and would not be able to leave the installation if they found the soundscapes overwhelming, the melodic material could act as a 'palette cleanser' for the electronic material – giving the pupils a break from the unfamiliar soundscapes and also highlighting the unfamiliar in the electronic sound-worlds. It also reflects the descriptions of melodic material, for example in the song of the mud people, which are a key part of the book.

The Wind Singer – without voice[47]

> In the centre of the area, in the circle paved with white marble that formed the stage, there stood the curious wooden tower known as the wind singer… It creaked this way and that with ever passing breeze, and when the wind blew stronger, it let out a dismal moaning sound.[48]

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[47] File path: LAHarrison /Installation 1 - The Wind Singer/2 Audio in patch/WindSingerwithoutvoice.wav

[48] Nicholson, *The Wind Singer,* p. 29

The installation begins with the sound of the Wind Singer without its voice. The sound is sets the scene for the installation, and is played while pupils read out the opening instructions for the installation. I wanted the sound for the wind singer without its voice to sound like it had the potential to be melodic. This was needed to create a connection to the melody that completes the installation. To get the initial wind sound I blew across the window of a plastic tenor recorder, as if it was a flute. This created a slightly pitched airy sound.[49] I then transposed the original sound by half-octave intervals to a maximum of 4 octaves above and below the original sound. These sounds were then put through a ring modulator in Sound Loom, creating a buzzing sound that highlighted the pitch. The sounds were then combined into a texture file.

Kestrel shouting through the wind singer[50]

> 'Bangaplop!' called Kestrel. She was on a level with one of the wide leather scoops
> as she called out this rude work, and the sound travelled down the pipes of the wind
> singer and emerged from the horns, a second or so later, in a fuzzy distorted form.[51]

The next stage of the installation recreates the sound that Kestrel makes by shouting through the wind singer. To reflect the echoing sound from Kestrel shouting through the wind singer, I decided to create a basic tape loop in Max 6. This would also be a good introduction for pupils to tape loop technologies as used in early electronic music, such as Lucier's *I am sitting in a room*.[52] Students were given text from the book and asked to shout it. When they reached a loud enough threshold (measured using Tristan Jehan's analyzer~ object[53]) an echo effect was created using the tapin~ and tapout~ objects. As the delay from the tapin~ object is increased the volume is decreased to create an echo. The overall volume has been

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[49] File path: LAHarrison /Installation 1 - The Wind Singer/4 Source Material/recorder_source_air.wav

[50] File path: LAHarrison /Installation 1 - The Wind Singer/3 Audio and Video examples/Echo.m4v

[51] Nicholson, *The Wind Singer,* p. 35

[52] Alvin Lucier, 'I Am Sitting In A Room', 1969.

[53] Tristan Jehan, 'Analyzer~' <http://web.media.mit.edu/~tristan/maxmsp.html> [accessed 6 June 2018].

kept relatively low to prevent feedback. This part of the patch mutes automatically after three

minutes to encourage pupils to move on to the next part of the installation.
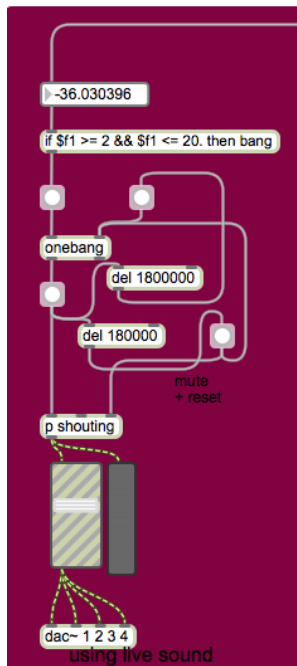

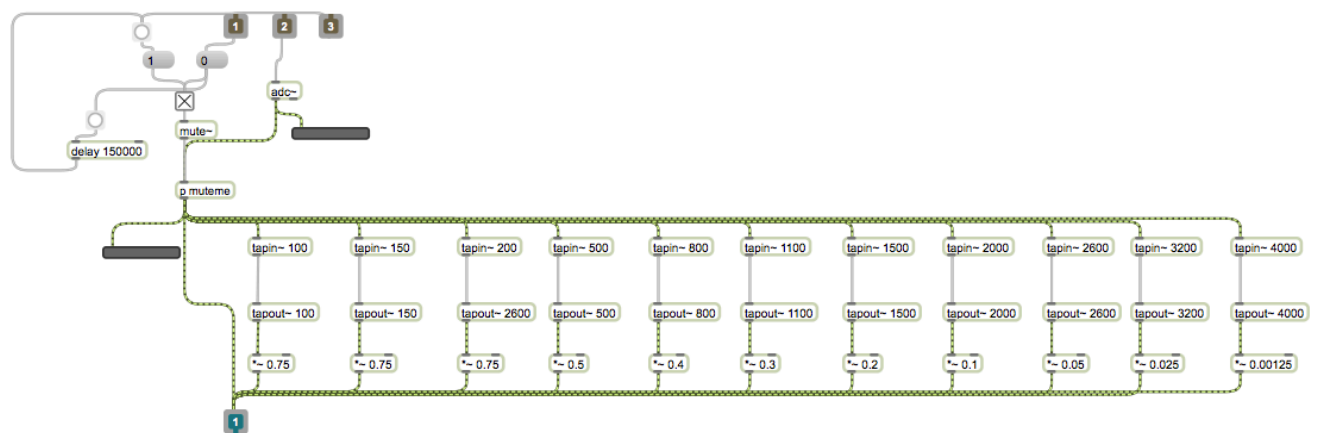**Figure 2 Max 6 patch triggering the tape loop effect**

Figure 3 Creation of a tape loop in Max 6

The song of the mud people[54]

> As they set off, the mud people raised their hands in a gesture of farewell, and then
> they started to sing. It was a sweet soft farewell song, no words, just wave upon wave
> of melody.[55]

In the next part of the installation the children are given shelter by a tribe called the mud people. Before continuing on their journey they are asked to help with the mud nut harvest. I placed small objects around the space that needed to be collected for the harvest. These were collected into a basket with a very basic pressure sensor connected to the Makey Makey. When enough had been collected this would trigger the song of the mud people. This is the first notated piece of material within the installation, as it is also the first point in the book where a melody is fully described. This section of music is characterised by its slow tempo and almost religious settings and is influenced by Ennio Morricone's score for The Mission[56], this is most audible in the sustained falling melody, such as in bar 17 of the soprano line. This influence was included as the piece represents a similar travelling into the unknown and potential danger as is featured in the plot of The Mission.

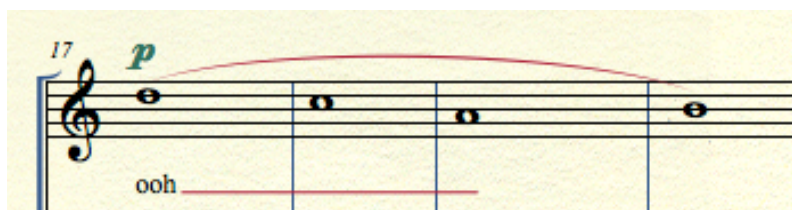**Figure 4 - Falling melody from the Mud Song**

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[54] File path: LAHarrison /Installation 1 - The Wind Singer/2 Audio in patch/windsinger_2.wav

[55] Nicholson, *The Wind Singer,* p. 158

[56] Roland Joffé, *The Mission* (USA: Warner Bros., 1986).

I chose to use a pad synth in place of the voices as this moved the sound away from human voices, suggesting that the mud people might not be human. I also thought that this better represent the 'wave upon wave of melody' described in the book as the sound could be continuous, without breaths.

The sandstorm[57]

> The wind grew stronger, lifting more sand into the air, dulling the brightness of the sky. Walking became difficult, because the sand stung their faces, and they had to twist their heads away from the wind. Then through the blurred air ahead of them there loomed a low square structure, like a hut without a roof, and they turned their steps towards it to take shelter.[58]

The initial performance of The Wind Singer had an audience aged 7-10. The installation lasted for the required 20 minutes, but I was aware that the next performance would be for pupils aged 11-16 who would take less time to complete tasks than the younger age group. Based on this, I decided that an additional section was needed for the second performance. This was based on a section in the book where the children build a shelter out of destroyed land sailors in the desert. For the sound of the sandstorm I wanted to distort the sound from the room and create a feeling of disorientation. The sound is based on the whistling sands, Porthor, in Snowdonia, which make a squeaking sound when walked on.

I added a function into the Max patch that the sound would only be triggered if a pitched sound were made. 30 seconds of sound from the room was then recorded into a buffer and used as the basis of granular synthesis using the munger1~ object which represented the grains of sand swirling around the children in the desert. I added a ramp to the granular synthesis so that the sound would randomly be played in one of the following four ways:

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[57] File path: LAHarrison /Installation 1 - The Wind Singer/3 Audio and Video examples/Granular_Synthesis_Example.wav

[58] Nicholson, *The Wind Singer*, p. 159

- Forwards at the correct speed

- Backwards at the correct speed

- Forwards at half speed

- Forwards at double speed

To create a disorientating feeling of the sand swirling around the children, I randomised the panning of the sound across four speakers around the space using the *vbap* object.
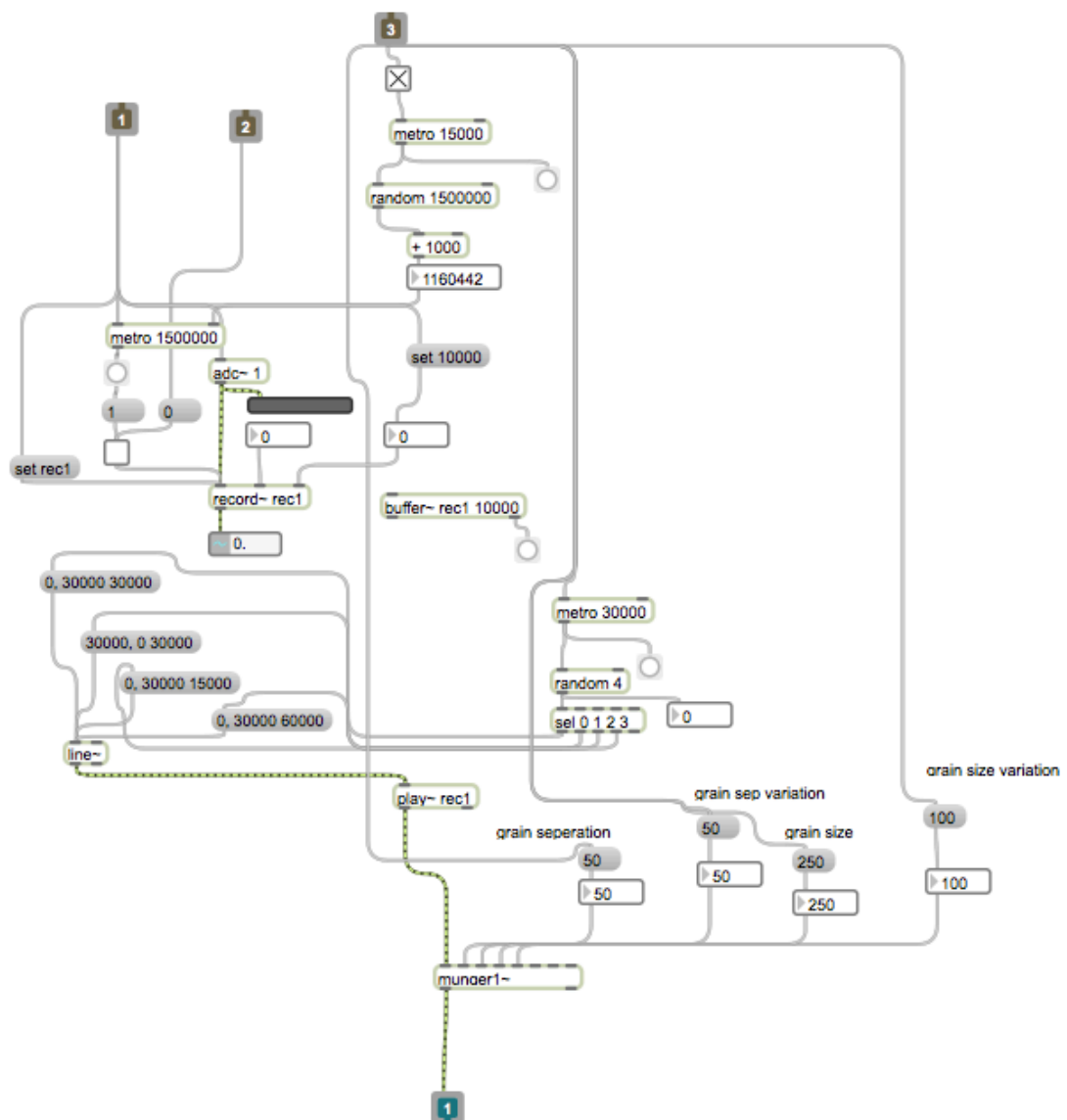

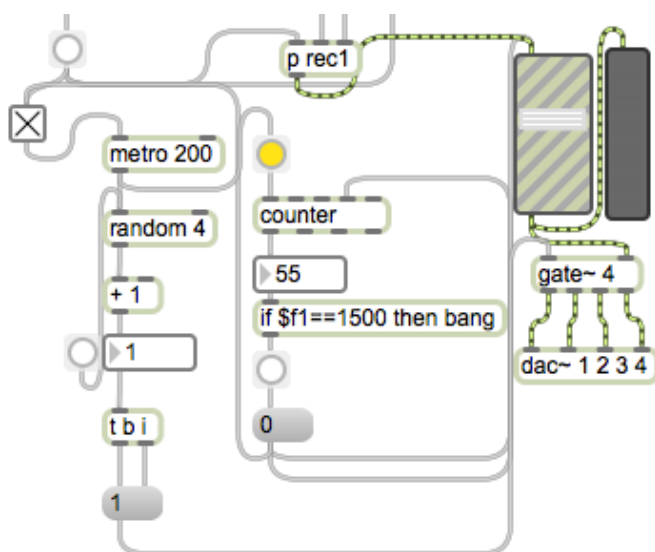**Figure 5 - Granular synthesis using the munger1~ object**

Figure 6 - Randomised panning using the vbap object

The crack in the land[59]

Influenced by 21 Balançoires (21 Swings) by Daily Tous Les Jours,[60] I wanted one part of the installation to create an instant and fun interaction where pupils could see the cause and effect of their actions. This would contrast the darker tone of the plot and the sounds that would come later in the installation. I chose to replace a bridge that the children have to cross in the book with 'stepping stones' to create a walk along keyboard. Each stepping stone was a very basic pressure sensor connected to a key on the Makey Makey and mapped to a different note in cycle~.

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[59] File path: LAHarrison /Installation 1 - The Wind Singer/3 Audio and Video examples/Pads.m4v
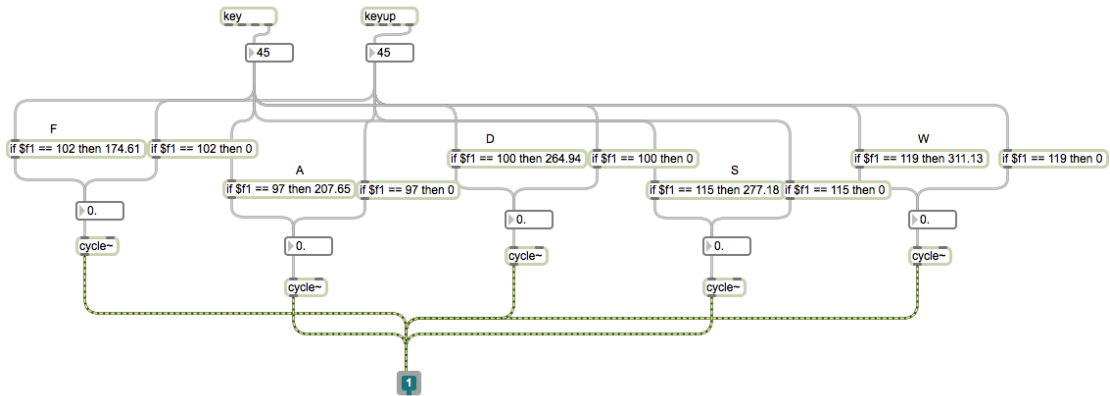
[60] Daily tous les jours.

Figure 7 - Stepping stones frequencies

This was a very popular feature, and was highlighted by many pupils in their feedback as being a favourite part of the installation.

The voice of the Morah[61]

> As Bowman gazed into those watery blue eyes, he saw them change. In her eyes there were other eyes, many eyes, hundreds of eyes, staring back at him. The eyes drew him in, and in each he saw more eyes, and more so that there was no end to them. As he looked, he felt a new spirit flood his body, a spirit that was bright and pure and powerful.
>
> 'We are the Morah', said the million eyes to him. 'We are legion. We are all.'[62]

When the children reach the hall of the Morah they find her asleep with the voice of the Wind Singer as a comb in her hair. By removing the comb they wake the Morah and her army of Zars. In the installation the voice of the Wind Singer was stored on a table, where all the students could see it as they arrived from the bridge. The voice was made from metal, when removed from its holder it registered on the max patch as the key being raised. This triggered the recording of the Morah. For the voice of the Morah I wanted to recreate Bowman's

[61] File path: /Users/l_a_harrison/Desktop/L A Harrison /Installation 1 - The Wind Singer/2 Audio in patch/morah.wav

[62] Nicholson, *The Wind Singer*, p. 278

experience. I wanted to the sound to be immediate, as if it were almost inside the audiences'

heads. I recorded the text being whispered in three sections and then used these to create

textures. 'We are the Morah' is chaotic and is panned around the four speakers at random, to

sound like a swarm. In the second section 'We are legion' I made the voice enter at structured

intervals, as if the voices are becoming regimented. The final part 'we are all' the voices

speak in unison, but with a very slight delay between layers, to make it sound less human.

The idea for this layering of sound came from the Victoria line of the London underground,

where quite often the speakers are out of sync creating a phasing effect. Rather than the

intended welcoming and trustworthy sound of the announcements, the woman begins to

sound electronic and inhuman making the announcements sound sinister.

The Zars[63]

> From far off he heard the sound of distant music: drums, pipes, trumpets. The
>
> unmistakable sound of a marching band accompanies by the tramp of marching
>
> feet…
>
> this army of white and golden youth, were singing the same some as Bowman, the
>
> song that had only one word.
>
> > 'Kill, kill, kill, kill! Kill, kill, kill!'
>
> The tune was martial but melodic, and the melody, once heard, was impossible to
>
> forget. It swung up and down and back up to its climax; and then round it cam again,
>
> relentless.[64]

The Zars are the army of the Morah that are unleashed when the children take the vice of the

wind singer. I wanted to reflect the text from the book, which contrasts the cheerful melodic

material with the words that they were chanting to a sinister effect. The music of the Zars is

written for a standard brass band, with military percussion. The score is a pastiche of military

music, written in a major key.

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[63] File path: LAHarrison /Installation 1 - The Wind Singer/2 Audio in patch/zars4rev.wav

[64] Nicholson, *The Wind Singer,* p. 278

The main melody uses syncopation and triplets to sound jaunty and celebratory.
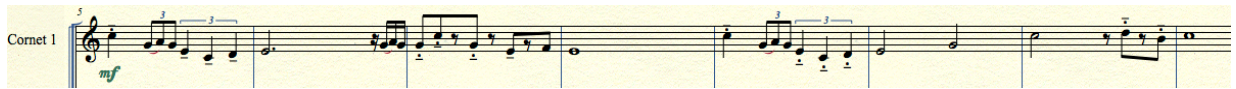

Figure 8 - The Zars melody

I chose to not include the voice chanting 'kill' for the practical reason that the chant could be easily imitated by the school pupils, which would not have been appropriate for the school setting. To create the same sense of un-ease that the chanting brings in the book, I added a sustained string synth cluster to clash with the melodic material. When this is combined with the syncopated melody it moves from sounding jaunty to unhinged. This synth continues after the melodic material has stopped so that it gains a smothering, unchanging quality.

Figure 9 - The Zars, sustained synth

The wind singer – with voice[65]

Softly the silver horns began to sing.

The very first note, a deep vibration, stopped the Zars dead in their tracks…

The next note was higher, gentle but piercing. As the wind singer turned in the wind,

the note modulated up and down, over the deep humming. Then came the highest

note of all, like the singing of a celestial bird, a cascade of tumbling melody.[66]

To stop the sound of the Zars the pupils had to insert the voice into the Wind Singer. This triggers the Wind Song, the final sound in the installation. I wanted the Wind Song to relate to

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[65] File path: LAHarrison /Installation 1 - The Wind Singer/2 Audio in patch/windsinger_rev.wav

[66] Nicholson, *The Wind Singer,* p. 338

the opening sound of the wind singer. I combined the opening airy sounds of the original soundscape with melodic material for the flute. The melodic material gradually replaces the opening sounds until the wind singer is playing in four parts. This final piece has a strong folk influence, as demonstrated through the recurring, decorated rising fourths of the melody.
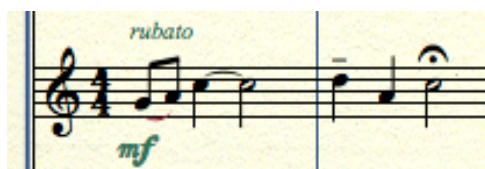

Figure 10 - The wind singer melody

The harmonic material is quite sparse and clear, to reflect a sense of calm as the voice of the wind singer is returned creating a simplistic choral sound.

Audience feedback

For both performances I used a feedback system standardised and approved by the venue. For the first performances at Girlguiding's ICANDO they gave feedback using a very simple like or dislike system as is the standard feedback system used at the centre. The children taking part did vote that they had enjoyed the installation, but no further feedback was given. The pupils from All Hallows Catholic College gave feedback via a written form, which was reviewed and approved by the school in advance of the performances (Appendix B).

Pupils were asked to rate their enjoyment of the installation from 1 to 5, with 1 being 'didn't enjoy' to 5 being 'really enjoyed'. The average score across 116 forms received from pupils was 3.45. It should be noted that some teachers chose to select pupils to take part in the installation while others watched. This may have affected some of the feedback given. In the future, clearer instructions should be given to all class teachers about sizes of groups that the installation can take to ensure that all pupils can take part. In addition to mentioning the interactive bridge, pupils also highlighted the voice of the Morah as being a favourite feature: '…the noises of the army appeared on the speaker and it felt like voices were behind you'

Other pupils mentioned the atmosphere that the sounds helped create: '…spooky mistereous (sic), dark, enchanting', 'It was very interesting it also made cool sounds and when we had to take the little plate out, there were cool whispers'

Some of the older pupils did suggest that they felt that the installation was a bit young for them. This was possibly as a result of trying to cater for such a wide age group. Other areas that the pupils felt could be improved were the visual design of the work, to make the installation more immersive, and they wanted the installation to last longer. Some pupils found the instructions slightly confusing; this could be improved by better instructions and signage around the installation.

The installation did meet the initial brief and the requirements by the school. It was the correct length and introduced pupils to new sounds and ways of composing within a structured installation environment. A very small number of pupils mentioned the sounds within their negative for the work and a number made positive comments about the atmosphere the sounds created, suggesting that this was an effective way to introduce younger audiences to *musique concrète.* In the future, when creating educational works, it would be better to work with a narrower age group, as the difference between a child aged 7 and a child aged 11 are very significant. This would mean that I could create a slightly more challenging work for the older age group. I also felt that the work suffered slightly from being very structured, as pupils did not have control over their own experience. This led to them being rushed through sections of the work when they may have wished to explore it further. In future installations I would like to investigate how I can give audience more control over their listening experience by making the installation less dependent on a narrative and allowing audience members more freedom to explore the sound.

That I will do my best...

Soundscape

Max 6, Sound Loom and Kinect for Xbox

Duration of material: 17 minutes 55 seconds

Alexandra Palace, London, 22-23 February 2014

The second piece in the portfolio *That I will do my best...* is an interactive sound installation created using Max 6 and Sound Loom for a Girlguiding World Thinking Day event at Alexandra Palace. It used a quad speaker setup, playing from mono tracks and detects motion using an Xbox Kinect.

The audience

Girlguiding is one of the largest youth organisations in the UK, with over half a million members. 100,000 of these are adult volunteers. Their youth section, aged from 5 to 26, is separated into four groups: Rainbows, Brownies, Guides and The Senior Section. [67] The members attending the event would be aged between 5 and 70 and mainly be women, due to the nature of the organisation. Adult members of Girlguiding will volunteer for at least two hours a week, if not more, while young members will often be engaged in a number of other extra curricular activities. Making this installation part of an event that members will already be attending with their guiding groups addresses the initial challenge of getting members to engage with the installation. It removes the need for them to choose to attend and makes the work part of their plans, including their guiding groups.

The brief

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[67] Girlguiding, 'About Us' <http://www.girlguiding.org.uk/about_us.aspx> [accessed 4 June 2018].

This was an exhibition style event that was run over two days with 4000 people attending each day.

Due to the style of the event the piece needed to have the same impact if a person chose to stay for thirty seconds or for ten minutes. Groups attending would be of various sizes, so the piece would have to be as effective for one person on their own or for the maximum number, which would be set at twenty. The piece would also have to cater for, and be relevant to, a large age range; the lowest age attending would be five, there was no upper age limit. Finally the event organisers asked that the piece be relevant to Girlguiding and World Thinking Day. World Thinking Day is an event for all members of the World Association of Girl Guides and Girl Scouts (WAGGGS) to celebrate their shared history and aims and is held on the joint birthday of the founders Lord and Lady Baden Powell.[68]

In discussion with the event organiser, I decided to base the piece on the Girlguiding promise. The promise is a common standard that links all members and the renewal of the promise is a central part of World Thinking Day celebrations. It is made by all age groups, with slightly altered wording for the younger girls, so would be relevant to all girls and adults attending; this would address the earlier limit relating to the varied age of the audience. Another reason for choosing to use the promise as a basis for the work was that the UK promise had recently been rewritten with new wording to be more inclusive and relevant to modern society. This would be the first World Thinking Day using the new promise wording during the renewal. The new wording is:

> *I promise that I will do my best:*
> *To be true to myself and develop my beliefs,*
> *To serve the Queen and my community,*
> *To help other people*
> *and*

[68] World Association of Girl Guides and Girl Scouts (WAGGGS), 'World Thinking Day' <https://www.wagggs.org/en/what-we-do/world-thinking-day/> [accessed 4 June 2018].

To keep the Guide Law.[69]

I wanted this installation to be very simple in form and how members would interact with it. This was done to give audience members control over their experience and more opportunities to investigate the sounds of the work, contrasting the structured approach taken for *The Wind Singer*.

The interface

The interface for this installation is a people controlled mixer.[70] Audience members can explore and become more engaged with sounds by moving to create their own mix of the work. This is similar engagement technique to the Philharmonia's I-Orchestra initiative that allowed audience members to experience how orchestral music sounds from a performer's point of view.[71] By doing this I hoped that that audience would have the opportunity to hear different elements of the soundscapes in detail, to experiment with standing in different locations to experiment with how speaker placement and their location affects the sound. I chose not to include any instructions for the work, as I did not want there to be a 'right' way to interact with the work. I wanted audience members to feel free to explore.

The development of the installation began with the Max patch. This needed to be a simple patch that tracked movement and created an instant response. I chose The Xbox Kinect to facilitate the interaction, as it is able to recognise multiple objects and detect gesture and movement along three planes. The installation would work within a box of space, which will be thought of from here as a grid using an X Y axis. In order to track the movements within this grid the patch would need to be able to track where each person, or object, is standing.

[69] Girlguiding, 'The Promise' <https://www.girlguiding.org.uk/about-us/what-makes-guiding-special/the-promise/,> [accessed 4 June 2018].

[70] File path: LAHarrison/Installation 2 - That I will do my best/3 Video and Audio examples/ThatIWillDo_Example1.m4v

[71] Philharmonia Orchestra, 'IOrchestra' (Plymouth, 2014).

The *KVL Kinect Tracker* app created by Zachary Seldess[72] provided a simple solution, allowing for multiple 'blobs' to be tracked within a confined space. The app also allows the user to define what the space where Kinect searches for 'blobs', so that people outside of the grid are not tracked as part of the work. Information from the app was sent via Open Sound Control (OSC), a networking solution for communications between computers synthesisers and other technologies, to the Max patch controlling the installation. Within the patch I used the *nodes* object, as a floor plan to create a people controlled mixer. The *nodes* object is a visual interface with a variable number of coloured zones and one movable point. This object has been developed further by Lawton Hall to include multiple points.[73] I combined the points and nodes in the patch with the information sent via OSC from the Kinect to vary the number of points and where these points are within the x y grid based on the number of people using the installation and where they move within the space. I then created a fader, developed from the fader created in the Max help file for the *nodes* object. This system allowed each zone to be assigned a different mono track; the volume of these tracks increases when a point is close to the centre of the zone.

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[72] Zachary Seldess, 'KVL Kinect Tracker' <http://www.zacharyseldess.com/software.html> [accessed 6 June 2018].

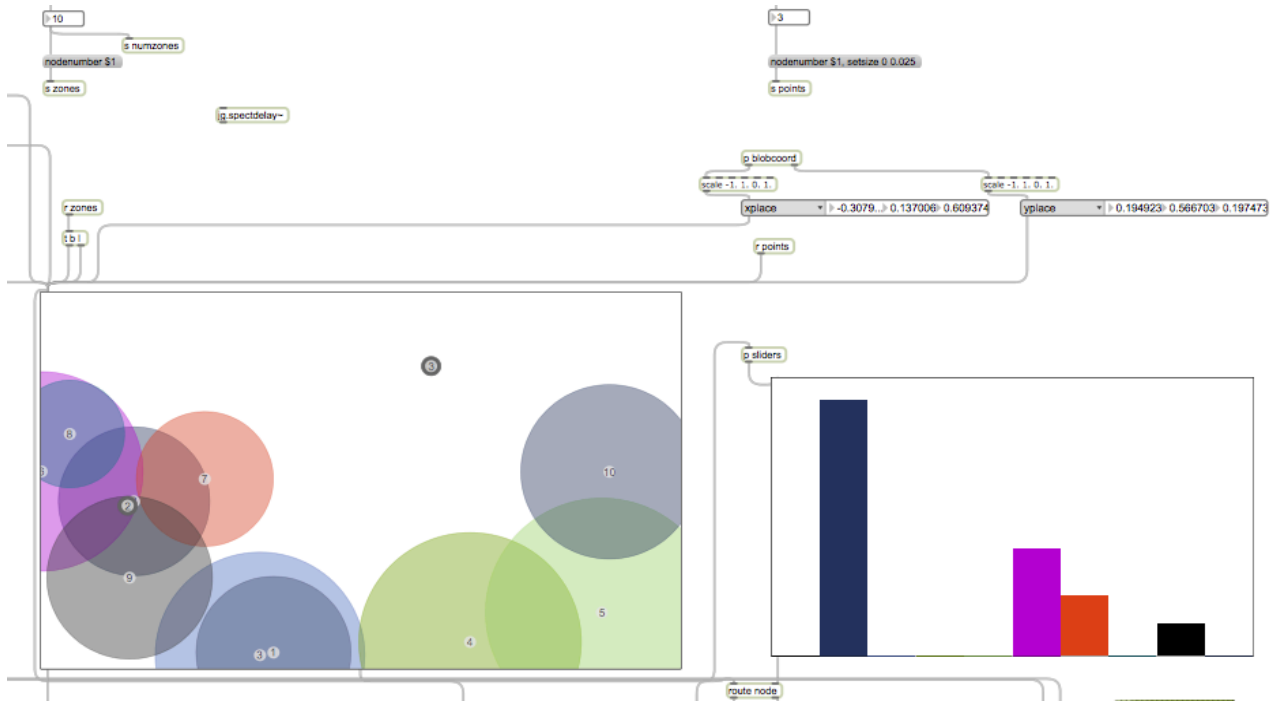[73] Lawton Hall, 'Points+zones.Maxpat', 2013 <points+zones.maxpat> [accessed 6 June 2018].

Figure 11 - Points and Nodes object combined with fader

The sound[74]

The soundscape for this installation is static, with variable mixes of the work being provided

by the interactive interface. This allowed for me to see how the interactive techniques work to

engage an audience with entirely electronic soundscapes in contrast to *The Wind Singer*,

which included notated material. From this I could evaluate the effectiveness of the interface

and interaction techniques and build on this for the final installation in the portfolio and gave

me the opportunity to experiment with how effective moment form is for installations.

The soundscape lasts 17 minutes 55 seconds and is divided into 10 separate channels.

The sounds within the installation have been created entirely from recordings of Girlguiding

members saying the Promise. It played on a continuous loop meaning that if a person

returned to the installation later in the day they were likely to hear a different part of the work.

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[74] File path: LAHarrison /Installation 2 - That I will do my best/3 Video and Audio examples/
That_I_Will_Do_Complete.wav

The sound was created from recordings of members saying the promise crowdsourced from members across the UK. This was the most efficient way for me to collect a large number of recordings from members of different ages and gave me a range of accents and intonations to work with and also meant that members would be aware of the work and engaged with the outcomes. They would want to visit the installation to hear how their recording was used or, in the case of some of the units from the north of England, it would allow for them to take part in an event that they weren't able to attend. Members were contacted via an open call for recordings on social media, through Twitter and Facebook. Girlguiding as an organisation supported this approach. As I would not be responsible for the engineering and quality of the recordings I provided online guidance with hints and tips for about how to record (Appendix C). Although social media was an effective way to reach a large number of people, the number of recordings received was relatively small. For example, a tweet asking for recordings of the promise sent on 13 January 2014 had a total of 2648 impressions (number of times it was seen)[75], but nine recordings of the promise were received in total. Recordings were of varying quality as most were created using mobile devices; this meant that some recordings could not be used in the final work. From the promises received, seven were of a suitable quality to be used within the installation; from the other two, one used the wrong wording and one clipped repeatedly. There were imperfections and variations in the recordings that were used in the final recordings. It was an aesthetic choice to keep these imperfections as it highlighted that the material had been crowd-sourced and prevented the opening of the piece from sounding artificial and homogenised.[76]

From the promise recordings I wanted to create a sound world where the wording moved from being fully recognisable to both naturalistic and the artificial before returning to the original words. As using the Promise was a key way of engaging with the audience at the event, it was important that the source material could be heard throughout the work, as this would encourage them to interact with the work. It was important for me that all the

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[75] Data from Twitter.com, see Appendix D
https://twitter.com/laharrisonmusic/status/422754637720977408 (accessed 29 August 2016)

[76] File path: LAHarrison/Installation 2 - That I will do my best/4 Source Material

soundscapes were created from the original recordings. I wanted the people who provided recordings for the work to feel that they were fully incorporated in the outcome. If parts of the soundscape were created without using the original recordings then, it could be argued that, the outcome would have been the same had the members not been involved in the creation of the work. The piece begins with a complete rendition of the promise divided across all the recordings establishing the source material and the focus of the installation. It then focuses on the opening 'I promise', which is used to transition into the more abstract sound worlds. This is done using 'blur', a spectral process in Sound Loom, which deletes selected frames of sound. By gradually increasing the number of frames deleted the speech moves from being recognisable into a metallic science fiction soundscape. This world is developed by combining the blurred sounds with transpositions downwards, extending the sounds and making a feature of the imperfections of the recordings. From here the sounds move gradually from the synthetic to a more natural sound world, beginning with rain, created using a shredding process, then birds made using a process that imitates tape transposition. The soundscape then becomes more synthetic by combining these transpositions with a process that traces specified harmonics. By slowly increasing the number of harmonics traced, the final two lines of the promise are revealed to complete the soundscape.

The piece was mixed into ten separate mono tracks. These tracks were then placed into the mixer that had been developed in Max. When creating the mono tracks it was important that they were balanced so that an equal amount of material was consistently placed across the tracks, ensuring that there would be material in all of the zones. This worked effectively with complex textures but was more of a challenge with thinner textures. In these cases the material was repeated across tracks. These parts had to be mixed at a lower level than the rest of the tracks to ensure that the sound did not overload if all the faders were raised.

Evaluation

Due to this being an exhibition event, I was not able to ask members to fill in feedback forms. I evaluated the work based on conversations with audience members and the event

coordinator and observing audience interactions. Overall the installation met the needs of its audience and the brief given by the event organiser. By creating an interactive space where members could cut across the installation when travelling to other activities, a lot of members experienced the work without actively seeking it out. This led to audience members stopping to listen further, or returning later on. The work benefitted from being able to take large groups at one time, without needing to operate a queuing system. This meant that members used the installation as a 'filler' activity while they were waiting for activities with a queue, increasing participation. Many audience members were surprised that all the sounds in the installation had been created from recordings of the promise. I had prepared information on my website to explain the sound processes and how the work was developed if audience members were interested after the event. However, this would rely on members taking the time to visit the website after the event. To build on this initial interest in the soundscapes it would have been more beneficial to have printed resources available in addition to the information on the website. This is something that I included in the next installation.

Although the installation met the brief given by the event organiser there were some areas that could have been improved. Firstly, during the development process I did not do enough research about the space within Alexandra Palace and what other activities would be in the same area. The installation was placed in an area with other sound based activities including a junk orchestra, a samba band and a gamelan workshop. The soundscape that had been created for the event had quieter moments that were obscured by the other activities happening nearby. For similar events in the future it would be better to work with bolder sounds that would have more instant impact, this is something that I investigate further in the next installation.

During the event there were a number of girls that wanted to control the installation from the computer.[77] This highlighted the need for more direct and obvious interaction with the work from audience members, and better documentation about how the piece worked.

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[77] File path: LAHarrison/Installation 2 - That I will do my best/3 Video and Audio examples/ ThatIWillDo_Example2.m4v

An interesting approach to take would have been to use live processing within the patch. Part of the work could then be for audience members to record themselves and become part of the piece. This would make the work more dynamic, increase interaction and allow the piece to develop during the event. This would also create more variations between performances. Pre-recorded voices would be needed initially, to encourage participation.

Further attention needed to be paid to how the space for the installation looked. I had spent a lot of time creating the patch to allow interaction with the soundscape, crowdsourcing material so that Girlguiding members were involved with the project and developing the soundscape and not enough time had been spent looking at the space. On the first day of the event there was an empty black space inside four speakers. This looked uninviting to passers-by on their way to other activities. In addition health and safety regulations required a large amount of hazard tape to cover cables making it look as if people were not allowed to enter the space. Once inside the space there was no guidance as to what people were expected to do to produce a sonic result. Although it had been an intentional decision to not produce in depth guidance on using the installation, so that the audience did not feel that there was a 'right' way to interact, this was off-putting and made people unwilling to interact with the work.

Figure 12 The installation space

On the second day of the event I added arrows to the space to suggest a pathway through the installation. This simple addition greatly increased the amount of interaction from all age groups.

Figure 13 Young members interacting with the work

The impact of future works would be increased if developed with a stage designer. This would

increase the amount of interaction with the work and make the space seem more inviting to

audience members. For this particular installation an ideal solution would have been to

project the parts of the patch showing the zones in the space. This would have allowed the

audience to see how they are interacting with the work and increase participation. After this

installation I also experimented, within my professional theatre work, with putting this the

motion-tracking interface within a doorway. This meant that all audience members had to

walk through the interface. This is something that I will develop further within the next

installation.

Let's build a fort!

Soundscape and live electronics

Max 6, Sound Loom, Xbox Kinect and Raspberry Pi

Duration of pre-composed material: 46 minutes 6 seconds

5th Base Gallery, London, 2-13 February 2016

Spatial, visual design & props – Ele Slade

The final installation in the portfolio, *Let's build a fort!* is an interactive, musical blanket fort created to give audience members between the ages of 20 and 30 a place to play and explore while creating feelings of nostalgia. This is the only installation in the portfolio that has not been developed with an external organisation. I wanted this installation to address to structural and developmental challenges that were identified in the evaluation of earlier installations.

Audience

The work is aimed at an audience of young professionals aged between 20 and 30. It would be expected that they had no family responsibility and some disposable income. This is an audience of young professionals who are looking for new experiences. They will regularly attend arts events, such as art exhibitions, theatre and pop concerts but would not attend classical music. Their main motivation to attend an event would be new or unusual experiences, being able to project an image via social media and shared experiences with friends. The main challenge to engaging with this audience would be to create a product that was different and engaging enough to compete with other arts events happening locally.
To address this I wanted to create an installation with multiple layers of interaction, similar to the multiple tasks created for The Wind Singer. This would give audience members a lot to explore when visiting.

The initial idea for the work needed to be simple and easy to explain in one sentence, as this would help with marketing and with people recommending the work to their friends.

The theme of an interactive blanket fort would connect with audience members who are in emerging adulthood, a term coined by Psychologist Jeffrey Jensen Arnett to describe the phase of life moving from late teenage years to having adult responsibilities[78], as it would remind them of childhood play and exploration. It would allow for multiple opportunities of interaction throughout the work and it was easily explained on a poster, allowing it to compete with other arts opportunities in the market.

Design inspiration and considerations

The initial idea for 'Let's Build a Fort!' came from the episode 'Conspiracy Theories and Interior Design' from the TV series 'Community' by Dan Harmon.[79] The series is set in an American Community College called Greendale. In this episode, the characters Troy and Abed build a blanket fort that gradually takes over the entire school. It has different tunnels and chambers, allowing for the creation of different themed rooms. Building forts and dens is an almost universal childhood experience and provided a lot of scope for sound and interaction. It would also immediately put the audience back in a childhood state of play and exploration and, by creating different themed rooms within the fort, I would be able to create distinct soundscapes and interactive opportunities.

To address the challenges of the interface not being appealing for interaction, encountered during *That I will do my best…* and *The Wind Singer* I chose to hire a professional stage scenographer, Ele Slade, to collaborate on this installation. This would allow me to further consider the audience experience and expectations, while hiding the electronics needed for the work.

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[78] Jeffrey Jensen Arnett, 'Emerging Adulthood: A Theory of Development from the Late Teens through the Twenties', *American Psychologist*, 55.5 (2000), 469–80, pp 469-480

[79] 'Conspiracy Theories and Interior Design', *Community*

As part of our initial design meetings we considered how we wanted the audience to think, feel and react to the work. As the work is based on forts that children build it was important that audience members felts a sense of nostalgia, and possibility (e.g. potential to create and play). We wanted them to feel safe within the space and that they were encouraged to play and explore. Finally we wanted them to have conversations about their childhood experiences, sparked by the sound, visual design and interactions.

The way that a child would interact with a fort would be slightly different to how an adult would approach an installation. An adult may be more reserved about playing and what they were 'allowed' to do. This had to be considered within the design of the project. We created a potential path through the work to encourage interaction and guide the audience; this would be included in a map at the entry to the installation. There were then possibilities to take a different route, if the audience wished. This provided the option for structure if wanted but also meant that audience members were able to spend more time exploring and discovering sounds, an option that was not provided during the more structured *The Wind Singer*.

Figure 14 The fort map

As part of the design we considered the different ways that children play within forts and dens and how this could be incorporated into the work. To influence this we used our own, and the production team's experiences, as well as having conversations with friends and family about forts that they built as children. For some people the aim was to create a shared hiding space for friends, where adults or brothers and sisters were not allowed. For others forts were active spaces to play, this would include role-playing games like playing as soldiers or pirates. Some people would create a fort to help them to have time on their own, away from their family. This would create a quiet place where they could read. Others enjoyed building the fort more than playing inside and would destroy their fort as soon as it had been built so that they could start building it again. We decided to use these different types of play to create distinct zones within the installation. This would mean that audience members would be able to find a zone that reflected how they played as a child.

The zones were:

- 'The fortal' – the entry to the fort.
- 'Blanket bastion' – A quiet zone to sit with friends and tell stories.
- 'Cardboard castle' – An active zone with playground games.
- 'Pillow palace' – A space that allows audience members to build their own fort.
- 'Single stronghold' – Individual forts that give audience members a quiet place to read.

To reflect the key theme of nostalgia, and to appeal to the projected audience items sourced for the space were all taken from the early to mid 1990s. All the sonic source material within the space was thematically linked to the section of the work to create an additional layer of understanding and interest, if audience members chose to read further about the sound work. Further information on this was provided in a free programme as well as through my website. As the installation would be placed within a small gallery space, all the sounds would be audible from different sections. It was important that the sound would all blend if triggered simultaneously. This influenced the amount of pre-recorded material and live processing that

was used within the installation. By using some live processing I was able to take in the sound being created by other sections, adding to the atmosphere of the room and creating a coherent installation. During sound checks for the installation, the 'Single stronghold' soundscapes were not audible over the other, bolder, sounds within the installation. As this section was meant to be a solitary experience for audience members, I replaced the speakers with headphones to allow audience members to hear the more detailed soundscapes.

The fortal[80]

I wanted 'The fortal', the entry to the fort, to sound like it had the potential for adventure. All the sounds were created from sounds that you would hear entering a house: keys being put on a table and a dog shaking itself as a greeting.[81]

As this was the first thing that audience members would hear, these sounds needed to be bold. They needed to instantly spark nostalgia in the audience and make them excited for the rest of the installation. During the 90s there were a number of adventure based games shows such as *The Crystal Maze, Knightmare* and *The Incredible Games*. *The Crystal Maze*[82] and *Knightmare*[83] have both recently been relaunched in alternative formats aimed at the 20-30 market, making these shows a tangible reference point for the target audience. In these shows 'futuristic' sound effects would be played to set the scene before contestants were sent on their adventure. I designed the sound to the opening sound effects from these shows, to make audience members feel like they were being sent on a quest. The sounds created were bold and futuristic and were separate into four categories: futuristic computer, spaceship console, space and time travel.

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[80] File path: LAHarrison/Installation 3 - Lets Build a Fort/2 Audio in patch/1 Fortal

[81] File path: LAHarrison/Installation 3 - Lets Build a Fort/4 Source material/1 Fortal

[82] Little Lion Entertainment Ltd., 'The Crystal Maze Live Experience' (London and Manchester, 2016).

[83] Paul Flannery, 'Knightmare Live' (Edinburgh, 2012).

The computer sounds were created from keys being rattled against a key ring, to create a bell like sound when slowed down and transposed downwards. Multiple versions of the sound were then created by tape transposition by intervals of 6 semitones in either direction. I then used a chorus filter to make the sound less clean and stretched the output by multiples of 4 to reveal artefacts in the sound. These sounds were then all placed together within a texture file. The same process was used to create the space console textures but with more chorus used on each of the samples to create distortion. For the time travel sounds, the same process and source material was used but without the final stretching of the material. This created a metallic, liquid sound. The space sounds were created using rattling keys. I then used the same spectral tracing process, as used in 'That I will do my best…' to highlight the pitch of the source material. These sounds were then transposed by multiples of 12 before creating the textures. To me this suggested space creatures communicating.

Eleven sounds, were loaded into a Max Patch which triggered a sound at random when a clap, or equivalent percussive sound, was detected by the Bonk~ object. Audience members were instructed to clap to start their journey.

Blanket bastion[84]

 'Blanket bastion' was an enclosed space, filled with toys and objects that audience members would remember from their childhoods in the 1990s. The aim for this space was for audience members to tell stories from their childhoods together underneath the blankets. A bright light was shone at the far side of the space allowing shadows to be projected.

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[84] File path: LAHarrison/Installation 3 - Lets Build a Fort/3 Audio and Video examples/1 Blanket Bastion/Blankets_soundscape.wav

Figure 15 Blanket bastion

The 'people controlled mixer', using the Xbox Kinect, that I created for *That I will do my best…* was re-appropriated to be used within this space with an 8 track soundscape. Shadow puppets were included in the space to encourage audience members to interact with the sound by moving within the space. The benefit to this interface being place within this enclosed, tent-like, space was that audience members had to move past it, triggering the sound.

This soundscape represents trying to remember experiences, songs and games from childhood that might be buried in the memory. This is based on a conversation that I had with a parent about the unexpected challenges that they had faced. 'When you become a parent you suddenly have to remember stories and songs that you haven't thought about since you were a child, you have to relearn how to play'. As the area was a space for audience members to tell stories the material was based on fairy stories and the act of telling stories as a child. The source material for this soundscape was created from the phrases 'once upon a time' and 'and they all lived happily every after'.

I wanted this soundscape to sound like a memory that you can't quite access, it's ethereal and keeps changing like the dreams in Roald Dahl's The BFG.

> 'A dream,' he said, 'as it goes whiffling through the night air, is making a tiny little buzzing-humming noise. But this little buzzy-hum is so silvery soft, it is impossible for a human bean to be hearing it.'[85]

The sound was created by stretching the original source material to 32 times its original length and transposing down by 32 semitones. The output was then tuned and transposed in semitone intervals up two octaves and down three octaves. This created a synthetic string sound. These notes were then places within a texture that was separated across 8 mono tracks.

An unexpected feature of the people controlled mixer being placed within this small space was that the Kinect was much more sensitive to people moving in the space than it had been in the exhibition centre space for *That I will do my best…* This, at times, created a rhythmic strobing effect within the soundscape.[86]

Cardboard camp[87]

Based on the success of the interactive stepping-stones in *The Wind Singer*, I wanted the fort to include a section with instant interaction for audience members. 'Cardboard camp' was designed to resemble an outdoor play area and included a version of the game Twister and a

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[85] Roald Dahl, *The BFG*, 2010 edn (London, 1984), Page 52

[86] File path: LAHarrison /Installation 3 - Lets Build a Fort/3 Audio and Video examples/1 Blanket Bastion/Blankets_Strobing_Example1.wav
LAHarrison /Installation 3 - Lets Build a Fort/3 Audio and Video examples/1 Blanket Bastion/Blankets_Strobing_Example2.wav

[87] File path: LAHarrison/Installation 3 - Lets Build a Fort/3 Audio and Video examples/2 Cardboard Castle

hopscotch created with Bare Conductive electric paint,[88] which linked to an Adafruit capacitive pi HAT for the Raspberry Pi.[89] The pi was running a sample programme, created by Adafruit, which mapped each sensor to a sample stored in the Pi. By painting the interface on the floor using games that audience members would know from their childhoods audience members would be able to discover the sounds through play.

Figure 16 The Cardboard Camp

[88] Bare Conductive, 'ELECTRIC PAINT 50ML' <http://www.bareconductive.com/shop/electric-paint-50ml/> [accessed 4 June 2018].

[89] Adafruit, 'Adafruit Capacitive Touch HAT for Raspberry Pi - Mini Kit - MPR121' <https://www.adafruit.com/product/2340> [accessed 4 June 2018].

The sounds were closely associated with childhood experiences. The game of Twister played the sounds of ice cream chimes[90] created by recording a music box and editing it into separate notes, each linked to shapes on the Twister board. A small surface speaker was used without being attached to a surface, and concealed within a flowerpot. As the speaker was low quality and playing at full volume the sound distorted creating the sound of an ice-cream van. This hopscotch played samples of a descant recorder playing the notes B, A, G, C, D.[91] these are some of the first notes learnt when learning the recorder using the John Pitts, Recorder from the Beginning book.[92] The same surface speaker that was used to create the distorted ice-cream van created the sound of overblown recorders during a recorder lesson.

During the day the wires from the sensor were knocked and moved meaning that, at times, some samples were triggered without an audience member being in the space. The benefit of this was that it hinted to the audience about the sound that was in the space, encouraging exploration to find out how the sounds were triggered.

Pillow palace[93]

In 'Pillow palace' audience members were invited to build their own fort using the pillows and objects within the space. The sound represents the shapes and changes that sound could take when you were a child, tricking you into thinking there were monsters under the bed or triggering the imagination.

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[90] File path: LAHarrison/Installation 3 - Lets Build a Fort/2 Audio in patch/3 Cardboard Castle/Twister

[91] File path: LAHarrison/Installation 3 - Lets Build a Fort/2 Audio in patch/3 Cardboard Castle/Hopscotch

[92] John Pitts, *Recorder from the Beginning* (Leeds: Arnold-Wheaton, 1984).

[93] File path: LAHarrison/Installation 3 - Lets Build a Fort/3 Audio and Video examples/3 Pillow Palace

Figure 17 Pillow palace

This is the only part of the installation that uses live processing. I wanted to include a soundscape that reacted to audience members in real time but I was aware that there were already a lot of sounds happening within a small gallery space. By using live processing, taking in sound from the gallery as a whole, the soundscape is able to represent sounds being transformed by our imagination, while complementing the other installations within the space. By limiting the live processing within the installation to one soundscape I was able to maintain the novelty of this technique. Audience members were not expecting it, making it seem unusual within the work.

While audience member build their fort sound is taken from the space and transformed through granular synthesis using the munger~ object, in a similar way to how it was used for the sandstorm in *The Wind Singer*. After this, parts of the spectrum are retained using John

Gibson's jg.spectdelay~[94] object allowing the soundscape to retain melodic material that has been played around the gallery.

Single stronghold[95]

'Single stronghold' represented a space for people looking to escape the world through their fort. It contained children's books to explore and remember. Each stronghold had a set of headphones, allowing for the detail of each soundscape to be heard and further enhancing the feeling of seclusion for audience members.

Figure 18 The single stronghold

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[94] John Gibson, 'Jg.Spectdelay~' (Indiana: Indiana University, 2014)
<http://pages.iu.edu/~johgibso/software.htm> [accessed 6 June 2018].

[95] File path: LAHarrison/Installation 3 - Lets Build a Fort/3 Audio and Video examples/4 Single Stronghold/Pages.wav

The sound within this space has been created from the sound of turning pages to create a soundscape in moment form.[96] The soundscape starts with the sound of turning pages stacked and transposed to create depth of sounds. This accentuates the creaking sound of the paper and the microphone overloading as the air is disturbed by the pages moving past. The soundscape then gradually becomes the sound of fire crackling and burning, created by using a process called shred on the original stacked material. This process shreds the sounds and then reassembles the shredded pieces. The creaking and clicking sounds of the pages turning combines with this shredded material to then, briefly, create a rhythm. The soundscape then moves to create an alien landscape, made by transposing the shredded material and then repeating the shred process. Gradually these processes are reduced until the soundscape returns to the original, stacked, material.

Evaluation

Three main opportunities were given for audience members to provide feedback about the installation. Firstly an audience survey was placed alongside programmes, which also collected audience arts consumption habits, in order to be able to measure whether the installation was reaching the intended audience (Appendix E). Audience members were encouraged to share their photos from the fort on Instagram and Twitter (via @letsbuildafort_), allowing for less formal interaction with the show. With the photo owner's permission, these photos were printed and displayed in the gallery. Finally, immediate reactions were gathered via a sheet of paper where audience members were invited to 'leave us a message'.

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[96] File path: L A Harrison /Installation 3 - Lets Build a Fort/4 Source material/3 Single Stronghold
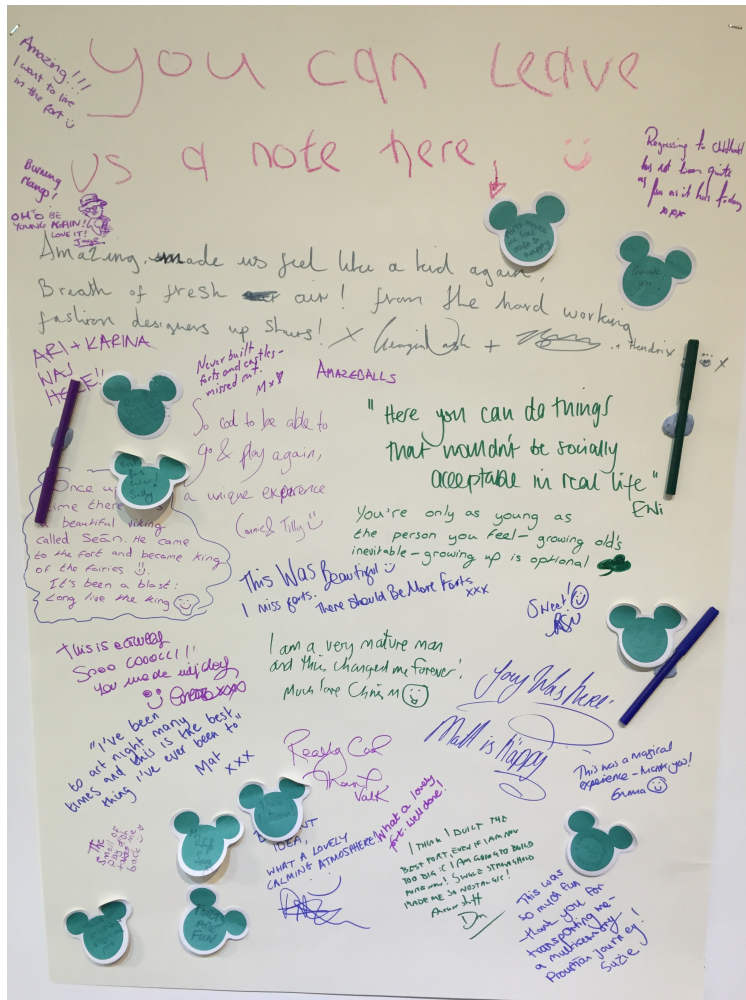
Figure 19 Notes from the fort

The installation benefitted in reaching its target audience from being included in the Whitechapel Gallery's *First Thursdays* walking tour,[97] a curated walking tour of late night gallery openings in East London. This gave us an opportunity to reach audiences who were actively looking for new arts experiences.   Audience feedback for the work was in general very positive, with many audience members commenting on the calming atmosphere, the opportunities to play and the soundscapes.

> 'Great! Lovely comfortable environment, constant interest in the sounds, and a
> beautiful design.'

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[97] Whitechapel Gallery, 'First Thursdays' <http://www.whitechapelgallery.org/first-thursdays/> [accessed 4 June 2018].

'A great throwback to the past, interesting use of the sound in every direction - becomes more apparent as you go through -> even as I write this! The first fort was my fave! Great idea and well executed! Feels a bit apocalyptic in some ways, how we would stay sane by regressing to a happier time.'

'Very engaging and made us focus on sounds that we may sometimes take for granted (e.g. pages).
Plus it was lots of fun while engaging with some original musical ideas.'

'I felt like a child and played and had fun. It was relaxing, nostalgic and strangely beautiful.'

Conclusion

Through this portfolio of compositions I have captured a period of development and change within my interactive sound installations. Through *Let's build a fort!* I moved closer to achieving my aims of creating a sound installation that investigates themes of escapism, play and alternative worlds.

Collaboration with other artists and using audience members in a creative, interactive role has helped me to push my work creatively and investigate new sound worlds. When staging *That I will do my best…* I neglected to fully consider how the staging would look within a crowded exhibition space, meaning that the work looked uninviting to audience members. By working with a designer for *Let's build a fort!* I was able to better consider the staging and how it would invite audience members to interact with the sound, meaning that audience engagement with the sound increased. In order for this staging to feel relevant to the soundscapes it must reflect the theme of the work, this was most successfully done in *Let's build a fort!* where each section of the installation combined the sound and stage design, for example, 'Single stronghold', a section filled with books, used the sounds of pages turning.

The most successful audience interactions within the portfolio were instant, such as the stepping stones in *The Wind Singer* and the games in the 'Cardboard Castle' in *Let's Build a Fort!*, as the audience were able to achieve an instant result. Creatively the more successful uses of interaction where the ones that created unexpected results, such as the strobing effect achieved through the shadow puppets in *Let's build a fort!* as these showed the effect that the audience could have on the work and how their presence changed the sound. These results showed the need of having an audience; they were active participants and collaborators in the work.

Since completing the work within this portfolio I have continued to seek out collaborative, creative projects, which have allowed me to benefit further from other people's creative processes. These have included the 2016 National Trust project, *Live, Loves and Losses:*

Traces at Fenton House[98]*,* an immersive installation with interactive and static sound

installations, immersive, site specific theatre projects with Lost Text/Found Space[99] and the

upcoming 2018 Living Libraries project.[100] As the sound within these productions has been

one element within a larger show, I have been looking at the audience's invitation to interact

with the work. Collaborating with designers has allowed me to further integrate the electronic

interfaces into installations, so that audiences can interact through instinctive actions. For

example, in the 2018 Living Libraries project the interaction is all based around books and

reading so the interaction is embedded into the action of opening books while the National

Trust interaction was placed within embroidery and asking audiences to break the boundaries

that are normally expected within National Trust properties by inviting them to touch the work.

For future projects I will be looking at how my work can include elements of escapism while

addressing the current political landscape. I will be developing my technique of embedding

dual levels of understanding within my work, the immediate meaning and engagement

followed by deeper meaning, to draw out political and allegorical qualities of my source

material helping for me to address political questions and challenges. This is building on

themes that I have already been investigating through my collaborative theatre work, for

example in *Til We Meet in England*, which addressed Brexit and the refugee crisis and *The

Living Libraries* that is investigating the importance of libraries within the community

engagement and the impact of the widespread closure of libraries as community resources.

Audience engagement and targeting new audiences remains central to my work and I will

continue to take an audience centred approach to development in the future. Through this

portfolio I have begun to build techniques that have helped me reach wider audiences with

my work, but I do believe that there are audience groups that have not been reached through

my work. In my work I have developed techniques that have created welcoming environments

for audience engagement. By working with external organisations such as schools and

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[98] Traces, 'Lives, Loves and Loss: Traces at Fenton House' (London: National Trust, 2016).

[99] Rebecca McCutcheon, *Til We Meet in England* (London: Lost Text/Found Space, 2017).

[100] Laura Bridges, *Memories of Fiction: The Living Library* (London: University of Roehampton, 2018).

charities I have been able to meet some audiences in places where they are already compelled to engage with the work. To develop this further I want to move my work into more public spaces, bringing my work to where my target audiences are already spending their time such as in shopping centres or parks. This will allow for me to gauge how successful my techniques are for an audience with a wider range of choices for engagement who have not chosen to attend an art or community event.

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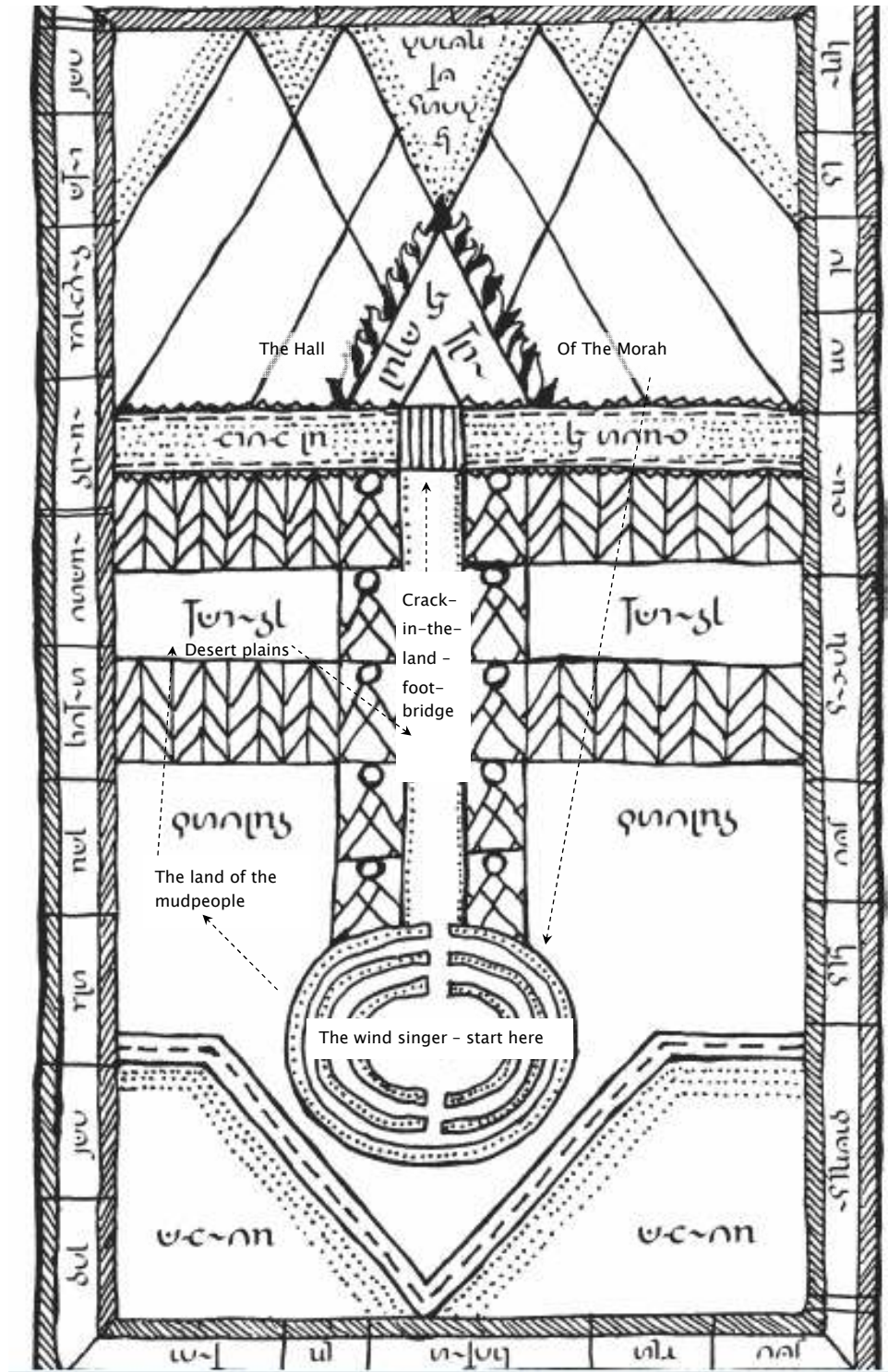Seldess, Zachary, 'KVL Kinect Tracker' <http://www.zacharyseldess.com/software.html>

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Appendices

Appendix A

The Wind Singer Map

The Hall

Of The Morah

Crack–in–the–land – foot–bridge

Desert plains

The land of the mudpeople

The wind singer – start here

Appendix B

Student feedback form

The Wind Singer - Feedback

How much did you enjoy the work?

(Please circle)

Didn't enjoy   1   2   3   4   5 Really enjoyed

What was your favourite part of the work?

What didn't you like about the work?

Would you want to do something like this again?

Yes   No

Why?

Would you like to be involved in creating a similar project?

Yes   No

Why?

What do you think you have learnt from the work?

Appendix C

Guidance for recordings

Tips for recording:

You don't need expensive recording equipment to get involved, use the gadgets that you already have. Smart phones and mp3 players provide a great alternative.

Make sure that there is minimal background noise when recording. Think about heaters and anything that might hiss.

Turn all phones in the room onto flight mode, or switch them off. Nothing spoils a recording like the signal sound from a phone.

Do a test run. Digital recordings mean that you can have as many goes as you like. Test it before hand listening to whether everyone can be heard and the words are clear.

Keep it lively!!

Appendix D

Twitter data – 13 January 2014

Tweet Activity

Lucy Harrison @laharrisonmusic
Fancy being part of a new installation for World Thinking Day? Members of **@Girlguiding** click here to find out more http://laharrisonmusic.co.uk/#/get-involved/4581080873 …

Reach a bigger audience
Get more engagements by promoting this Tweet!

Get started

Impressions	2,649
Total engagements	67
Link clicks	31
Detail expands	19
Profile clicks	12
Retweets	3
Likes	2

Let's Build a Fort!

Audience Survey

Thank you for visiting Let's Build a Fort!

I would really appreciate you taking the time to fill in a short audience survey.

This will be used to inform my PhD research into audience engagement with sound

art. There is no need to include any names and no names, or identifying information

will be included in the research.

Thank you

Lucy Ann Harrison

Age:_____

Gender:_____

Which of the following have you visited or attended in the past 12 months?

(please tick)

Visual art exhibition   Video art event/exhibition

Digital art event/exhibition   Literary event (e.g. book or poetry reading)

Public art display or installation   Theatre

Immersive art/theatre   Opera

Musical theatre   Live classical/art music

Live popular music   Live dance

What motivates you to attend arts events?

Your thoughts about the fort