

Justice, Freedom, Peace, Memory - Using Locative Technology and Augmented Reality as Tools for Examining Location, History and Soundscape

Yonatan Collier, The School of Film, Music and Performing Arts, Leeds Beckett University
yonit@cloakanddagger-music.com

Abstract

'Justice, Freedom, Peace, Memory' is the first in a series of location-specific works that will form the basis of my practice-based PhD. It is an immersive, interactive musical work that has been mapped onto the streets of the city of Groningen in The Netherlands. The music is created primarily from field recordings gathered at the specific locations in the city where the work was later performed. The piece uses aural augmented reality (AR) to blend the performed work with the soundscape of the city itself.

'Justice, Freedom, Peace, Memory' is 'performed' through a GPS-enabled Smartphone and headphones. GPS technology allows for the mapping of a composition over a landscape, so that the music is experienced within the context of a very specific geography. It is possible to achieve a fine alignment of sound with space that enables the structuring of a musical work around specific city landmarks. In addition to hearing a musical piece that has been mapped on to the environment, the audience also hear the sounds of the city soundscape in real time; a soundscape that has formed the basis for the musical composition itself. This work therefore combines the real and the virtual into an AR experience.

It was my aim to use locative technology, AR and a non-linear musical structure to encourage an audience to engage with the history of the performance location. This paper will discuss the technical and compositional methodologies that were utilised in the creation of 'Justice, Freedom, Peace, Memory'. Furthermore, the use of locative technologies and AR as tools for the interrogation of a specific site, its history and its soundscape will be examined.

Overview

'Justice, Freedom, Peace, Memory' is an immersive, interactive musical work that has been mapped onto the streets of the city of Groningen in The Netherlands. The piece uses aural augmented reality (AR) to blend the performed work with the soundscape of the city itself. The intention of this work was to engage an audience with the history of a specific location, whilst also guiding them towards an appreciation of its present-day soundscape. Specifically, the piece aims to encourage participants to spend a moment of quiet contemplation at the 'Sint Joris en de Draak' war memorial; a location that they may rush past on a regular basis, without ever stopping to engage with its historical significance.

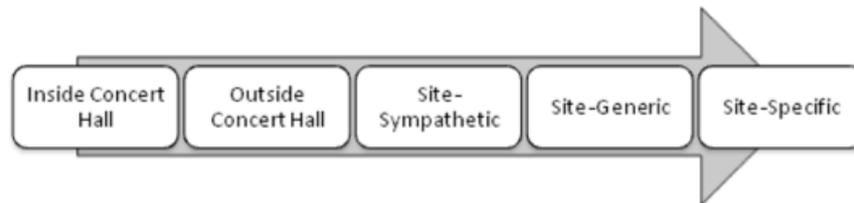
Music has often been used to raise questions about the "[relationship] between material locations and art" (Hudson, 2015, p.63). Musical composition that is strongly rooted in a specific location can help us to a greater understanding of "both landscape and identity" (ibid. p.76), and indeed, Adorno suggested that sound and landscape can be used to "think with" (DeNora, 2003, p.3). 'Justice, Freedom, Peace, Memory' is an immersive composition that is 'performed' through GPS enabled Smartphones. GPS technology allows the mapping of a composition over a landscape, so that the music is experienced within the context of a very specific geography. The music that is composed for this project is created primarily from field recordings gathered at specific locations in the city centre of Groningen. This means that the music retains timbral relationships with the soundscape of the performance location; a link that enhances the immersive quality of the work. It is hoped that by offering an audience an immersive, interactive experience in a specific location, that audience can be encouraged to develop a deeper engagement with the history of the location. Furthermore, through the use of field recordings and AR, it is anticipated that participants will also become more engaged with the soundscape of the performance site.

Site-Specific Art

Hudson (2015) points to numerous attempts at artistic engagement with a specific place across a number of artistic forms, a process that can be described as 'site-specific discourse' (Pearson and Shanks, 2001). In particular, he examines the work of Richard Skelton's 'Landings Sequence', which is amongst other things, a "musical investigation of history and landscape" (Hudson, 2015, p.63). Skelton examines these themes, using his art as a "refraction point for a series of intersecting discourses" (ibid. p.66) including man's relationship with nature, and the multiple, overlapping histories embedded within a location. Hudson concludes that site-specific discourse can be an effective tool in exploring human identity within a specific locality. Locative technologies and Augmented Reality offer us new opportunities in site-specific discourse that this composition aims to explore.

Site-specific art emerged in the late 1960s, in part as a reaction to the increasing commodification of art, and in part to promote the ideal of universality in the arts. This art took many forms, but was consistent in that its creators insisted on the inseparability of their work from its context (Kwon, 2004).

In more recent years, this idea has come under scrutiny however; performance theorist Fiona Wilkie has argued that there are various degrees of site specificity, and asked the question 'Does site-specific imply site-exclusive?' (2003, p. 149). This idea, originally discussed by Wilkie in relation to theatre, was adapted to the sphere of music by Mace Francis (2016).



Degrees of site-specificity in music, adapted from Fiona Wilkie's diagram in relationship to theatre by Mace Francis (2016).

The first degree of site specificity, inside concert hall, refers to the performance of music in a traditional musical space. Outside concert hall refers to music performed in a traditional way, but at a different location, for example in a park that has been chosen to host a music festival. Site-sympathetic refers to placing work into a site that is "sympathetic to the essence of the musical work" (Francis 2016, p.43). Kraftwerk's performances in the Tate Modern's Turbine Hall could be considered site sympathetic; songs about technology performed in a room that once housed the electricity generators of a power station. There is a metaphorical connection between the music and the location but there are not deep links between the music and the physical, cultural or historical significance of that specific site. Site-generic refers to work to which certain characteristics of the site are integral, but when these characteristics can also be found at other similar sites. This could include a work that relies upon a performance site having a certain reverb sound. The work could conceivably be toured around other sites that have the same reverb profile. Francis explains that for "a work to be truly site-specific it must reference deeper layers of the site: historical, social or physical characteristics such as found objects or sounds. Site-specific... must be so connected to a site that it cannot be performed in any other place" (2016, p.43). It is therefore possible to define 'Justice, Freedom, Peace, Memory' as truly site-specific. It can only be experienced at the location it has been mapped to; the location at which all the field recordings that were used to create the piece were gathered.

Augmented Reality as a Tool for Engagement

Behringer and Kastel assert that "Augmented Reality has significant potential for enhancing the human interaction with cultural contexts through enabling a deeper engagement." (2016, p.197). 'Justice, Freedom, Peace, Memory' is delivered to participants through a Smartphone app that was created on the AppFurnace platform. AppFurnace has a web-based interface that can be used to place sounds in specific geographic locations. The experience can then be accessed in situ via an app that can be downloaded by participants using a QR code. The playback of recordings in the location of their capture opens up the intriguing prospect of an audience listening to sound in multiple layers; if played back through appropriate headphones, the sounds of the 'real world' will be audible to listeners,

alongside the sounds of the recording. The interaction of real-time and recorded sound will guarantee a unique, AR listening experience to every listener.

AR is often perceived to be in the visual domain; users can view digital content overlaid onto the real world by looking through a phone screen or smartglasses. However, AR actually includes the other senses as well (Behringer 2001); aural AR overlaying a real-world soundscape with digital sound. 'Justice, Freedom, Peace, Memory' satisfies the three conditions that are required for an experience to be defined as AR; it combines the real and the virtual, it is interactive in real time, and it is registered in three dimensions (Azuma, 1997).

There are certain parallels here to the work of Bill Fontana, whose 'Artists Statement' explains his use of the natural environment as a sound source: "My sound sculptures use the human and/or natural environment as a living source of musical information. I am assuming that at any given moment there will be something meaningful to hear and that music, in the sense of coherent sound patterns, is a process that is going on constantly" (Fontana, 2017). Any work attempting to incorporate the unpredictable noises of the real world into its structure owes a debt to John Cage, who in 1957 talked of "opening the doors of the music to the sounds that happen to be in the environment" (Cage 1958). As well as ensuring that each performance is unique, this kind of music can also encourage an audience to engage with the sonic world around them in a deeper way. Cage himself has said; "people have told me that, after hearing a concert in which noises are honoured as well as musical sounds, they listen to the sounds around them with more attention than they did previously" (Furlong 2012, p.54). It is hoped that through the use of AR, an audience will become more engaged by the 'real world' soundscape that they are present in.

'Justice, Freedom, Peace, Memory'

'Justice, Freedom, Peace, Memory' is located in the heart of the city of Groningen, and is composed primarily of fourteen looped musical passages. These loops vary in duration; from 24 seconds to almost two minutes. In addition to the loops, there are three 'one-shot' musical passages, that are not repeated. The playback of these musical passages is triggered by a participant moving into a designated 'zone'. When the participant leaves the zone, the passage will gradually fade out. It is possible to layer these zones in such a way that the piece will build in volume and density as participants move in a specific direction.

As outlined above, the piece is created in large part from field recordings that were gathered in the performance location. These recordings have been electronically manipulated in the studio, but timbral relationships to the soundscape of Groningen city centre have been retained. Schafer (1994) contends that "what the soundscape analyst must do first is to discover the significant features of the soundscape, those sounds which are important either because of their individuality, their numerousness or their domination" (p.9). To ensure that the music has a strong relationship to the soundscape of the city, it has been created from the dominant sounds of this location; bicycles, motor scooters, buses, human speech and the sound of the carillon in Martini Tower.

The technology allows us to map the structure of the piece to the physical geography of the location. 'Justice, Freedom, Peace, Memory' is centred around Groningen's Martini Tower, and a war memorial, 'Sint Joris en de draak' (St. George and the Dragon), that lies behind it. The tower is the highest point in the city, and is therefore a natural focal point; a constant reference when navigating Groningen's city centre. Participants can begin listening to the piece at a point of their own choosing. From this point, they are told (via the app) to walk towards the tower. As they approach it, more and more loops are triggered until, as they reach the base of the tower, the piece reaches its climax. In addition, the three 'one-shot' sounds will have been triggered at specific points on the walk – such as when the tower enters participant line of sight. Fourteen loops are used in total, and although the first two loops to be triggered are eventually replaced, twelve simultaneous loops will be playing by the time the tower is reached.

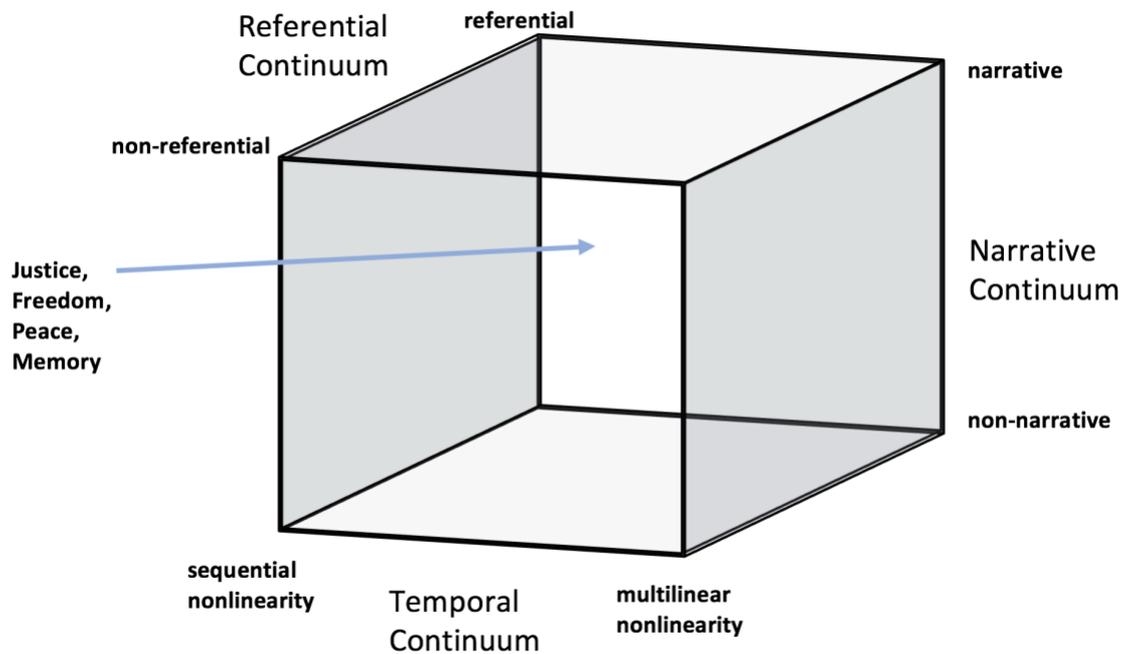
The listener now walks around the side of the tower to the memorial, where the music fades out, leaving the listener in a silent zone; one that will hopefully encourage them to consider the meaning of the place in which they find themselves. The crescendo in the music as the tower is approached is an important structural device. The contrast with the absence of sound that follows is more marked as a result, the intention being that the silence is therefore more profound. Behind the memorial is a garden; a quiet space within the city centre. Upon entering this space, a new musical passage is heard. In keeping with the surroundings, it is softer in tone, and is designed to encourage further quiet contemplation.

As has been previously discussed, the piece is delivered via headphones. There are numerous reasons why this delivery method was settled upon; not least the fact that it allows for AR experiences. Headphones can also offer us a more personal experience (even if this can come somewhat at the expense of the communal). David Toop (in Kelly, 2011), describes the intimacy of Janet Cardiff's 'The Missing Voice (Case Study B)' (1999). The work is delivered through headphones, and Toop writes; "I am inside her head, she is inside mine". Personal music players were initially designed to "allow the individual to escape into a fantasy world of music when the outside world seemed either hostile or just plain boring" (Glancey, 1999). When we listen to music through headphones, we are one step removed from the world around us, and can therefore become more introspective. If the audience is sharing an intimate personal space with the music they are listening to, it hopefully follows that their personal connection to it will be more intense, and they will think about it more deeply. Michael Bull (2007) has argued that while personal music players such as mobile phones and iPods are warming up the urban space for the user, they are making urban space chillier for everybody else. It is worth remembering therefore that something can be lost when each member of an audience experiences an individually tailored experience; a sense of communality, of shared experience.

Musical Structure and Language

The structure of the work is defined by both the physical characteristics of the performance location, and the movement of the participant through that location; both their speed and direction of movement will impact on the way the piece develops. The work therefore contains an interactive element, necessitating a nonlinear structure. Vickery (2011) describes the two extremes of musical structure; “completely structured linearity and completely unstructured nonlinearity”. He goes on to state that “nonlinear structures occupy the middle ground between these poles: resisting the formation of a unified directionality, but retaining at least a minimal relationship between some of their components”. Vickery (2013) outlines three continua by which nonlinear structures can be categorised. The temporal continuum ranges from sequential to multilinear nonlinearity. Sequential pieces have nonlinear structures in which there is no overlapping of internal musical structures; the component parts of a piece are played one after another, although the order in which these parts are played is subject to change. As we move towards the multilinear pole, more and more overlapping of internal structures is found. The idea of narrative is described by Kramer (ibid. p.44): “Musical works can produce a sense of directionality through a variety of means, and it is therefore possible to interrupt, reorder or subvert this apparent forward motion. This process requires the ability to infer in a work ‘an underlying linearity which is sufficiently straightforward and perceptible that we can understand a reordering of it’. If an audience is able to deduce a clear narrative in a work (perhaps it gets gradually faster, or gradually louder) then it can be placed closer to the narrative pole. If no narrative can be deduced, the piece can be placed at the non-narrative pole. The final continuum ranges from referential to non-referential. A referential piece will refer to another, external piece of music. “Reference to external musical sources assumes shared knowledge and usually implies that the listener both recognises the reference and is able to contextualise it” (ibid. p.57). As the structure of this piece is known (or can be surmised) by the audience, there is potential to disrupt this with nonlinearity. A non-referential piece is one that makes no reference to external pieces of music.

We can define ‘Justice, Freedom, Peace, Memory’ by utilising the classification methods detailed above. The piece can be defined as being close to the narrative pole of the narrative continuum; it has a clear trajectory, with density and volume both increasing the closer the audience get to the tower. This narrative can be disrupted; for example, if a listener is to begin moving away from the tower, or remains stationary. The piece lies close to the multilinear pole of the temporal continuum; the increase in density and volume is achieved through the layering of multiple loops. The loops are layered rather than sequential. Finally, the piece lies towards the non-referential pole of the referential continuum. The diagram below, visually demonstrates the position of ‘Justice, Freedom, Peace, Memory’ on the continua defined by Vickery (2013).



A non-linear structure allows for interactivity, and the reasons for creating an experience of this kind are compelling. Open Works, as defined by Eco (1984), are pieces of music in which “considerable autonomy [is] left to the individual performer in the way he chooses to play the work... he must impose his judgment on the form of the piece... this amounts to an act of improvised creation”. One of the benefits of composing pieces in this way is that the freedom afforded to the performer can excite their imagination (Hanoeh-Roe, 2003 p.155). By allowing audience members to ‘collaborate’ in the creation of the final musical experience, we can hope that they will have their imaginations excited by the process. It is also hoped that by engaging the audience in a creative process (one that does not require musical training), they will feel a greater sense of connection with the piece of music they are experiencing. The idea of lending the audience a certain degree of creative control has been central to the work of other artists. Christina Kubisch, describing her methodology, states her intent “to create a landscape of sounds (soundscape) in which the public can move freely, exploring and individually changing the composition”. She goes on to describe “creative listening” as the starting point for her sound installations and ‘sound-zones’ (1986). Similarly, media artist Butch Roan describes the allure of creating a work that is not complete until it is experienced by an audience; “I love the challenge of choreographing sound that exists in time – and also out of time – in the nonlinear world of an interactive installation. The challenge of creating a structure that only exists as potential content, and that is waiting for human intervention for it to come into being, is completely fascinating” (Park 2016, p.14).

Whilst the technology makes this kind of structure possible, there are certain constraints imposed by the delivery platform. This piece was created on the AppFurnace platform, a program that imposes certain limitations that had to be worked around. As with any phone app, file size is a consideration; ideally the app should be downloadable by users with no

access to Wi-Fi. There are therefore limitations on both audio quality and the length of musical passages. Where possible, loops were therefore kept fairly short. Seamless looping is not possible, so musical passages had to be constructed in such a way that short gaps in playback at the loop points would not be noticed. Finally, it was not possible to synchronise loops, so they had to be composed in such a way that playback of any loop could begin at any time.

It is necessary at this point to discuss the musical language used in the construction of 'Justice, Freedom, Peace, Memory'. In attempting to define the language of (electroacoustic) music, Emmerson describes a 'plane of possibilities' formed by the intersection of two axes. The first of these axes describes the continuum that lies between mimetic and aural discourse: "At one extreme, the mimetic discourse is evidently the dominant aspect of our perception of the work; at the other, our perception remains relatively free of any directly evoked image" (1986, p.19). The second axis describes the continuum that lies between abstracted syntax and abstract syntax. We can define abstracted syntax as "the extraction of structuring principles according to what is perceptually perceived as of pertinence within the material itself" (Weale, 2005). At this pole, the structure of the composition is created entirely in response to the sonic properties of the recorded material itself. A composer can be described as using abstract syntax when they impose a structure onto the music that is independent of the sonic properties of the sounds being used. Emmerson illustrates this two-dimensional plane in this way (1986, p.24):

Abstract syntax	1	4	7
Combination of abstract and abstracted syntax	2	5	8
Abstracted syntax	3	6	9
	I: Aural discourse dominant	II: Combination of aural and mimetic discourse	III: Mimetic discourse dominant

It is important to note that although Emmerson splits the plane into nine boxes for the sake of categorisation, each axis here is a continuum, along which the "composer is free to roam" (1986, p.24). 'Justice, Freedom, Peace, Memory', sits within the box marked '5'. The sound materials used as the building blocks for the work certainly influenced the compositional choices that were made, but they were not the only influencing factor. As has been discussed, the structure of the work is also shaped by the physical location that it has been

laid over. I have therefore used a combination of abstract and abstracted syntax. I have also used a combination of aural and mimetic discourse. It is intended that the work conjures thoughts of the history of the performance location. The music is also written in such a way that it feels 'embedded' in the everyday sound world of the location; these are both examples of mimetic discourse. However, more abstract musical features were also used in order to elicit certain emotional responses from the audience. For example, various melodic passages were designed to provoke feelings of apprehension as participants approach the tower, or a feeling of calm as they wander the garden behind the memorial. These are examples of a more aural discourse.

Participant Analysis

The intention of this work was to engage an audience with a specific aspect of the history of Groningen, whilst also guiding them towards an appreciation of its present-day soundscape. Specifically, 'Justice, Freedom, Peace, Memory' aims to encourage participants to spend a moment of quiet contemplation at the 'Sint Joris en de draak' war memorial, and to reflect on its historical significance.

The work was premiered at the Music Matters XXII Symposium at the University of Groningen on the 15th of June, 2018. Feedback was collected from participants in order to establish whether the above-stated aims had been met. Engagement with the current soundscape of the city centre was high, with all participants commenting on the relationship between the recorded sounds of the work, and the sounds of the 'real world' around them. One participant "enjoyed the sonic interaction", while another talked of the "interesting blend" between these elements. Only half of the participants mentioned that the work had caused them to think about the history of the location, so perhaps in future more explicit reference to this should be made within the app, perhaps as an introduction to the experience. The historical aspect of the piece did seem to resonate particularly strongly with one participant however, who commented; "When I heard the loud percussive sounds in the square they reminded me of the sounds of battle. I found myself wondering what had happened here before – what wars have been fought here?"

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