

# An Immersive Database of Sound Art: Towards a Minor History

J Milo Taylor  
CRiSAP Research Unit  
milo@suborg.net  
www.suborg.net

## Abstract

This paper presents a practice-based project being undertaken as part of a PhD research program at the CRiSAP Research Unit (Creative Research into Sound Arts Practice), London College of Communication. The project involves the development of a database of 'sound art' presented in an immersive installation environment, allowing a 'post-convergent' [1] experience of this 'minor' art history. Research activity has oscillated between a focus upon the technical means of delivering such a creative work, and a study of broader contemporary philosophy acting to inform and problematise such an endeavor.

The digital application being developed (ImMapp) is of particular relevance to the theme of the YTC conference. Much academic work addressing sound art has occurred within the confines of the monograph. The ImmApp however, attempts an alternative means of accessing and analyzing this fragmented history, and is in effect, a three-dimensional audio-visual atlas of the culture-space of auditory art practice and discourse.

The open-source digital technologies used in the creation of this work operate upon a plane distinct from, but complementary to, print-based methodologies. The culture of sound art has provided a key inspiration in the design of the application and the ImmApp is intended to embody some of the tropes evident in much sound work (spatiality, multi-speaker set ups, simultaneity, collage). The project as a whole has been shaped then by a symbiosis between digital technology, the kind of structuring enabled/limited by such, and the culture-space of a 'minor' art practice

This paper will outline the historical and conceptual context for the work, discuss the technical framework that has been adopted, demonstrate my working methodology, and end by proposing some possible trajectories for future work.

**Keywords:** sound art, database, MySql, XML, XSLT, X3D, web 2.0, immersive environments, Foucault, Deleuze, Guattari, 3D, realtime, performance, installation, BS-Contact.

## 1. Sound Art: A Background

While there is a long and rich history of artists, technicians, composers, poets, and inventors working creatively with sound, 'sound art' as a distinct practice, came into being in the late 1960s and early 1970s. The term itself is attributed to the Canadian artist Dan Lander sometime in the late 1980s [2]. He identified a growing trend at that time of an art form that operated in the liminal spaces between music and fine art and explored expanded notions of sculpture.

Even at this relatively early stage in the development of the form, practice occupied an extraordinarily diverse range of sites and creative positions. An early publication in the field, co-edited by Lander [3], traces a practice simultaneously situated in experimental music (John Cage, Pierre Schaefer, Alvin Lucier), installation art (Max Neuhaus, Christina Kubisch), radio work (Lander, Bruce Barber and others), industrial music (Throbbing Gristle, Boyd Rice, Nurse with Wound et al), soundscape studies and acoustic ecology (R Murray Schaeffer, Hildegard Westerkamp, Annea Lockwood), performance art (Gordon Monahan, Stelarc), and more obscure areas such as cassette-trading networks and anti-copyright culture.

The decade that followed (1990's) witnessed a measurable increase in the circulation of sound art specifically, and media art more generally. This period was also marked by a significant lack of supporting formal theorisation, critical writing or any sustained effort in mapping or collating this diverse activity in the field.

Access to this dispersed archive was limited to those either involved in the work itself (artists, curators, gallery staff, record labels and so on) or those who had the opportunity to experience the work *in situ* as part of an audience.

Since the late 1990s however, a number of publications have been forthcoming ( [4], [5], [6], [7], [8], [9], [10] ) and there is now a kernel of key texts that not only seek to place sound art within contemporaneous cultural practice, but also attempt a retrospective effort to articulate the aims and working practices of the many artists involved. Such texts are variable in their scope and quality, yet taken together as a whole they represent a territorialisation of practice and the development of a canon. A few ‘major artists’ are cited time and time again, and practitioners who are lesser-known (for a variety of problematic reasons) are pushed into a shadowy margin, within what is already a marginalised art practice. One of the aims of the current research is to break apart such exclusive constructions, and for the digitalised spatial environment, defined in important regards by its alterity, to articulate this other ‘minor’ history.

## 2. Theoretical Framework

The first period of the research was spent collating a useable archive of sound art and while the publications mentioned above provided some guidance towards the scope of the field, as did the academic literature, the nature of the archive was fractured and obscure. There were several operational difficulties to overcome at this stage. Where could the material that was to be included in the database be found, what would be the criteria for inclusion, and how should such material be treated?

The answers to these questions came about through a critical practice-based methodology whose overall form was suggested by on the one hand, the technology itself, and on the other, by post-structural cultural theory. Key theorists whose works have provided me with a constant and sustained conceptual paradigm with which to approach this work have been Michel Foucault and Giles Deleuze and Felix Guattari.

### 2.1 Michel Foucault: *The Archive, Discourse, Archeology & Genealogy*

Foucault’s work on the archive [11] [12], his studies of the historical development of certain discourses (sexuality, madness, medicine), as well as his problematicisation of authorship, (upon which the texts introduced above depend) suggested themselves as exciting starting points for the current study.

Foucault uses the term ‘archive’ in a specific way. When he uses this word, he is referring to the array of all possible statements that can be made at a given historical time, within a particular discourse. A methodology derived from Foucault’s work would address this notion of the archive, and apply two further Foucauldian concepts, ‘archeology’ and ‘genealogy’ in the study of this series of statements.

Simply put, an ‘archeology of knowledge’ takes snapshots of the archive at particular instants, and provides a description of what is found there. Foucault’s method is profoundly non-interpretive, there is no search for ‘deeper meanings’, there are none. All meaning is evident upon the surfaces found, in the interplay between subjectivities, institutions and discourse itself, and the method is purely descriptive.

Genealogy is a deepening of the archeological method, and studies how the contents of the archive change over time, and as such is a ‘comparative archeology’. Of paramount importance to Foucault is the relation of discourse to the archive and how this produces and reproduces knowledge and power relations between subjectivities. It is outside the scope of this paper to give a more detailed account of Foucault’s thinking and for those interested, some good introductory texts [13], [14] and more in-depth critical discussions of his work [15] are provided in the references section at the end of this paper.

### 2.2 Deleuze and Guattari: *Major & Minor*

Beyond the seductive conceptual tropes developed by Deleuze and Guattari [16] that inspired me in thinking about designing in virtual 3D space (rhizomes, a thousand plateaus, royal and nomadic space, territorialisations, and de-territorialisations and so on) one particular aspect of their work became more interesting to me; that of ‘the minor’.

For Deleuze and Guattari, the ‘minor’ occupies a position relative to the ‘major’ that is neither qualitatively nor quantitatively opposed to it; neither is it more or less significant. For these authors, “the major is that

[which] can be made to serve as an idea, category, or constant against which whether explicitly or implicitly, other phenomena can be measured” p48 [17]; examples they use are major languages, and major sciences.

The minor “is not the qualitatively or quantitatively inferior, but what is marked by an irreducible or uncontainable difference. It is not a subcategory or subsystem in a conventional sense, but what Deleuze and Guattari term at one point an “outsystem” (*hors-système*)” p50 [17]. A minor history applied to the context of exploratory sound work is explored by Branden W. Joseph in “Beyond the Dream Syndicate: Tony Conrad and the Arts after Cage” [17], and I have sought to extrapolate his discussion from the work of Conrad specifically to a wider set of artists working with sound. How would it be possible to treat sound art itself in this minor key? Would it be possible to challenge the major histories of the field with such a paradigm?

### 3. Development of the MySQL [18] database

With this framework established, the task of gathering, storing, organizing and retrieving information began. Initially, a quasi-statistical analysis was applied to material found in the literature; those artists occurring most often in the academic literature, and in those texts cited above, were those first entered into a MySQL database running on a local Apache server [19]. The design of this information architecture, an abstracted structure, malleable and changeable, offered an early insight into the kind of ontology inherent in the kind of discourse surrounding sound art within traditional mediums. For example, in an article from an academic journal, it is usual that a particular artist will be chosen as a valid site for analysis, and this practice, being far removed from post-structural claims of ‘the death of the author’, was interesting to me. Additionally, the treatments of nation, history, and the autonomy of the artwork suggested themselves as healthy areas for problematisation. This activity was to provide a control group, a conventional taxonomy, from which later ontological blurring would depart. This translation of linear text into the relational tables of a MySQL database revealed a few of these key silenced assumptions which are key targets for any Foucauldian scholar.

It soon became clear, that the type of sound art found in these sources was of a particular kind, very much part of the sort of ‘major history’ discussed earlier. As the period of study went on, and my understanding of the field deepened, it became clear that there was a significant amount of work that was falling to be addressed within the literature, and this understanding was confirmed during time I spent outside the United Kingdom whilst participating in various conferences, symposiums and masterclasses<sup>1</sup>. In traveling to countries ‘other’ than the UK, I was exposed to other forms of sound art, and other forms of surrounding discourse which were clearly distinct from the material I had found within the British and American English-language literature that had served me as a point of entry in the early stages of the work.

The choice of a MySQL database as a key tool within the research methodology was made through a desire to explore notions of an ‘open text’; unlike a monograph, whose contents are fixed, a relational database offers the possibility of constant renewal, a capability intended to resonate with what Foucault terms the ‘history of the present’.

For Foucault, the past is not a static and stable object, but a rather more changeable and fluid phenomenon. While the monographs mentioned above were useful to me in the process of uncovering the archeology and genealogy of sound art discourse, assessing them as true or false was to miss the point. They should be simply viewed as statements within the archive, and the areas to explore are centered around the specific practices that determine why these specific statements should be found, and no others.

Spending time in the contexts of Scandinavia, Canada and Germany provided me with the motivation to extent the scope of the project from being a *theoretically* open text, to being an open text *in actuality*. This strand of the work, while not central to my current objectives, offers some direction for future work and will be discussed in the concluding section of this paper.

### 4. Technical Overview: From MySQL to XML[20] via XSLT to X3D [21]

The ‘signal-flow’ of the ImmApp is imagined as a three-step iterative process of abstraction.

---

<sup>1</sup> Including: OpenForm Festival 07, Oslo, Norway. The Art of Immersive Soundscapes, 2007, Regina, Canada. ICMC 07 Copenhagen, Denmark. Auditory Cultures 07, Copenhagen, Denmark. Artist Residency Bad Ems, Germany 2008.

1. A study of monographs which in themselves abstract a phenomenologically [22] rich sonic-spatial experience, typical of sound art, into linear text.
2. The deconstruction of such texts (proposals, artist statements, exhibition catalogs, reviews, criticisms etc) into a relational MySQL database.
3. The transformation of this data into a reconstituted synthetic audio-visual-spatial digital media installation.

#### 4.1 MySQL Querying

Once the database had been populated with suitable material<sup>2</sup>, this MySQL dataset was queried via PHP scripting [23]:

```
<?php
mysql_select_db($database_Immapp, $Immapp);
$recordID = $_GET['recordID'];
$query_rs_work_by_year = "SELECT

id_year, year_year,
id_work,name_work,location_work,worktype_work,imageid_work,notes_work,year_work,
l1stname_artist,2ndname_artist,
workid_audio, file_audio,
id_image,image_image,
id_video,video_video,workid_video,
country_location,longitude_location,latitude_location

FROM year INNER JOIN work ON year_work = year_year
INNER JOIN artist ON workID_artist = artistID_work
INNER JOIN imageON id_image = imageid_work
INNER JOIN location ON country_location = location_work
LEFT OUTER JOIN video ON id_work = workid_video
LEFT OUTER JOIN audio ON id_work = workid_audio

WHERE id_year = $recordID

ORDER by location_work";
$rs_work_by_year = mysql_query($query_rs_work_by_year, $Immapp) or die(mysql_error());
$totalRows_rs_work_by_year = mysql_num_rows($rs_work_by_year);
$row_rs_work_by_year = mysql_fetch_assoc($rs_work_by_year);
?>
```

In response to this, we would obtain (as html):

```
<tr>
  <td height="30" colspan="5" align="left" valign="top" class="artistname"><span
class="nodes_specific">1981.29</span></td>
  <td height="30" colspan="7" align="right" valign="top"><a href="XML-
YEAR.php?recordID=122">XML</a></td>
</tr>
  <tr>
    <td align="left" valign="middle"></td>
    <td align="left" valign="middle">Ros</td>
    <td align="left" valign="middle">Bandt</td>
    <td align="left" valign="middle">The Sound Playground,</td>
    <td align="left" valign="middle">Installation</td>
    <td align="left" valign="middle">1981</td>
    <td align="left" valign="middle">Australia</td>
    <td align="left" valign="middle">-27</td>
    <td align="left" valign="middle">133 </td>
    <td align="left" valign="middle">audio/Bandt-1981-soundplayground.mp3</td>
    <td align="left" valign="middle"></td>
    <td align="left" valign="top"></td>
  </tr>
etc...
etc...
```

#### 4.2 MySQL to XML

With some further PHP script we can automatically output this content stripped of any HTML formatting as XML.

---

<sup>2</sup> At the time of writing, the ImMapp database contains records of 236 artists, 200 institutions, over 3000 works, 700 audio samples, 80 video files and several thousand images along with artist statements and proposals, reviews and catalog information and other supporting textual information.

```

<?xml version="1.0" encoding="iso-8859-1" ?> <?xml-stylesheet type="text/xsl" href="X3D-
XSLT_Work_Year.xsl"?>
<works>
  <work>
    <Work_ID>71</Work_ID>
    <Work_Year>1981</Work_Year>
    <Work_Image>images/works/Bandt-1981-playgroundPlan.jpg</Work_Image>
    <Artist_First_Name>Ros</Artist_First_Name>
    <Artist_Second_Name>Bandt</Artist_Second_Name>
    <Work_Name>"The Sound Playground,"</Work_Name>
    <Work_Type>"Installation"</Work_Type>
    <Work_Location>Australia</Work_Location>
    <Work_Location_longitude>133</Work_Location_longitude>
    <Work_Location_latitude>-27</Work_Location_latitude>
    <Work_Notes></Work_Notes>
    <Work_Audio>audio/Bandt-1981-soundplayground.mp3</Work_Audio>
    <Work_Video></Work_Video>
  </work>
  <work> etc... </work>
  <work> etc... </work>
  <work> etc... </work>
  etc...
</works>

```

### 4.3 XSLT of XML into X3D with Netbeans [24]

The next step is to apply an XSL transformation upon this XML and for this project this done in Netbeans, the open source, Java-based IDE. An XSLT is used to transform XML into the XML-derived language X3D, used for the generation of the immersive 3D environment.<sup>3</sup>

```

<?xml version="1.0" encoding="UTF-8"?>
<xsl:stylesheet version="1.0" xmlns:xsl="http://www.w3.org/1999/XSL/Transform">
<xsl:output media-type="model/x3d+xml" doctype-system="http://www.web3d.org/specifications/x3d-3.2.dtd"
method="xml" encoding="UTF-8" indent="yes" omit-xml-declaration="yes"/>
<!-- make X3D scene -->
  <xsl:template match="/">
    <X3D profile="Immersive">&#10;
      <head>&#10;<title/></head>
      <Scene>
        <xsl:apply-templates/>
      </Scene>
    </X3D>
  </xsl:template>
  <xsl:template match="works">
    <Group>
      <xsl:for-each select="work">
<Group>
  <!-- skeleton structure for elements, and x offset, y position, z offset WORKYEAR text -->
<Transform translation='0 0 0'>
  <xsl:attribute name="translation">
    <xsl:value-of select="(position() -1) +20 + 2.2"/>
    <xsl:text> 3 </xsl:text>
    <xsl:value-of select="Work_Year div 10 +0.2"/>
  </xsl:attribute>
  <xsl:attribute name="rotation">
    <xsl:text>0 </xsl:text>
    <xsl:text>1 </xsl:text>
    <xsl:text>0 </xsl:text>
    <xsl:value-of select="(position() -1) -0.1"/>
  </xsl:attribute>
  <xsl:attribute name="center">
    <xsl:text>-2.5 </xsl:text>
    <xsl:text>2 </xsl:text>
    <xsl:value-of select="Work_Year div 10"/>
  </xsl:attribute>

```

<sup>3</sup> A better solution would be to author a small Java application that could process the XML from within the X3D environment. If such XML processing could occur at run time, in response to typed search criteria, for example (or more imaginatively from speech), the results would take the performative and interactive aspects of the application into a more sophisticated domain.

```

    <Shape>
      <Appearance>
        <Material containerField='material' ambientIntensity='0.2' shininess='0.2' diffuseColor='1 .5 0' />
      </Appearance> <xsl:element name="Text">
        <xsl:attribute name="string">
          <xsl:value-of select="Work_Year" />
        </xsl:attribute>
      </xsl:element>
    <FontStyle containerField='fontStyle' family='Arial' style='PLAIN' justify="BEGIN" "BEGIN" size='1' spacing='1' />
  </xsl:element>
</Shape>
</Transform>
</Group>
etc.
etc.
</xsl:for-each>

</Group>
</xsl:template>
</xsl:stylesheet>

```

#### 4.4 X3D

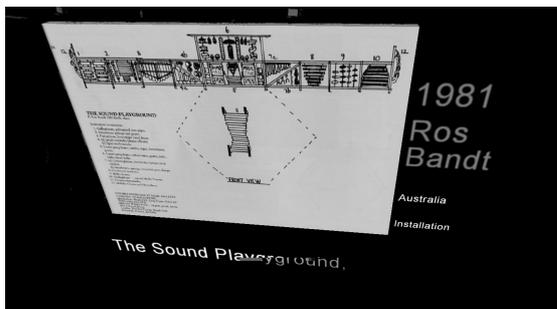
The output of this transformation once applied by the Java application is an X3D file formatted as follows:

```

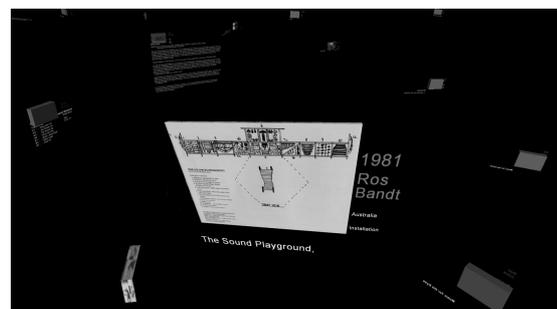
<!DOCTYPE X3D SYSTEM "http://www.web3d.org/specifications/x3d-3.2.dtd">
<X3D profile="Immersive">
<head>
<title/>
</head>
<Scene>
  <Group>
    <Group>
      <Transform translation="22.2 3 198.18" rotation="0 1 0 -0.1" center="-2.5 2 198.1">
        <Shape>
          <Appearance>
            <Material containerField="material" ambientIntensity="0.2" shininess="0.2" diffuseColor="1 .5 0" />
          </Appearance>
          <Text string="1981">
            <FontStyle containerField="fontStyle" family="Arial" style="PLAIN" justify="&quot;BEGIN&quot;"
            &quot;BEGIN&quot;" size="1" spacing="1" />
          </Text>
        </Shape>
      </Transform>
      <Transform translation="17.5 2 198.1" rotation="0 1 0 -0.1" center="-2.5 2 198.1">
        <Shape>
          <Appearance>
            <ImageTexture url="images/works/Bandt-1981-playgroundPlan.jpg" />
          <Material containerField="material" ambientIntensity="0.2" shininess="0.2" diffuseColor="1 .5 0" />
          </Appearance>
          <Box containerField="geometry" size="9 6 0.3" />
        </Shape>
      </Transform>
    </Group>
  </Group>
</Scene>
</X3D>

```

When this file is opened in an X3D browser (BS-Contact for example [25] ) we obtain the following:



**Figure 1a.** The transformed information derived from the MySQL query, now shown in 3D space.



**Figure 1b.** By zooming out from the previous example we experience the work in spatial relation to other artworks.

## 5. Conclusion & Future Work

The structure of this paper is intended to demonstrate the methodology used in the course of this work. Beginning from a close reading of print-based sound art theory, the project moves into a reconceptualization of this through its deconstruction into the semantics of a relational database architecture and XML (XSLT) before making a final representation of this information in real-time 3D.

The ImMapp provides an interactive environment where users can navigate a dynamically generated immersive field. One of the key features of X3D (specifically as facilitated by the BS-Contact browser [25] ) is the support provided for multichannel loudspeaker arrays (6.1 surround sound). The ImMapp is imagined as a real-world audio-visual installation, and visitors will be surrounded by projection screens and immersed in a pool of moving sounds. As one explores the virtual world, one passes through this semi-aleatoric synthetic soundscape, and is simultaneously informed, through graphic and textual material, of the specifics of place and practice which gave rise to many of these extraordinary artworks.

The example shown here is very much a work in progress, and what does not translate in a written account of the work is the sense of motion and flux, noise and silence, simultaneity, contradiction and discontinuity, as presented in the ImMapp environment. It is this relation between the phenomenological experience of auditory artefacts, their spatial distribution in synthetic space, the supporting contextual material and the overall post-convergent methodology that first intrigued me at the project's beginning, and continues to do so.

There are a number of weaknesses in the work, some inherent, and others which I hope to resolve in the future. One such resolvable area is the general poor support of audio in X3D, with the audio spatialisation being of the most primitive kind. By creating a distributed network of computers, visual rendering and audio processing tasks can be handled by different machines. In this way, audio spatialisation, and more sophisticated DSP, could, for example, be handled by a PureData [26] patch. The feasibility of deploying the IEM Ambisonics library to handle such audio processing is underway.

An additional area for future work would be to expand the ImMapp MySQL database into a Web 2.0-modelled collaborative community. One scenario would be for the database to exist on a remote server where it is opened to a contributory community along the lines of a multi-lingual wiki. This quasi-moderated archive would present a valuable resource for students, staff, artists and researchers, and may possibly readdress some of the biases evident in the application as it exists now. Further to this, a software download could be made available which would allow remote users to explore the fully immersive version of the database. In this way, a multi-site, multi-participant network collaboration would become possible and the scope this would have for an enhanced global conception of sound art points towards some interesting future possibilities.

## 6. References

1. Nash, A. (2007) *Interview*. Networked Music Review **Volume**,
2. Licht, A., *Sound Art: Beyond Music, Between Categories*. 2007: Rizzoli; Har/Com edition.
3. Lander, D., *Sound by Artists*. 1990, Toronto: Art Metropole & Walter Philips Gallery.
4. Kahn, D., *Wireless Imagination, Sound, Radio and the Avant-Garde*. 1992: The MIT Press.
5. Labelle, B., *Background Noise: Perspectives on Sound Art*. 2006: Continuum.
6. de la Motte-Haber, H., *Klangkunst [Sound art]*. 1996, Munich; New York:: Prestel. 304 pp. 345 illus. (27 colour) + diagrams, + maps, bibliog.
7. de la Motte, H. (Editor), *Resonances*. 2003.
8. Cox, C., *Audio Culture - Readings in Modern Music*. 2004: Continuum International Publishing Group Ltd.
9. Kahn, D., *Noise Water Meat*. 2001: MIT Press.
10. Gibbs, T., *The Fundamentals of Sonic Art & Sound Design*. 2007, Lausanne: AVA Publishing.
11. Foucault, M., *The Archaeology of Knowledge*. 1972: Routledge.
12. Foucault, M., *The Order of Things: An Archaeology of the Human Sciences*. 1974: Routledge.
13. Rabinow, P., *The Foucault Reader*. 1984, London: Penguin.
14. Kendall, G. , *Using Foucault's Methods*. 1999, London: Sage.
15. McNay, L., *Foucault: A Critical Introduction*. 1994, Cambridge: Polity Press.
16. Deleuze, G., *A Thousand Plateaus: Capitalism and Schizophrenia*. 1987: University of Minnesota Press.
17. Joseph, B.W., *Beyond the Dream Syndicate: Tony Conrad and the Arts after Cage*. 2008, New York: Zone Books.
18. <http://www.mysql.com/why-mysql/>. *MySQL*.
19. <http://www.apache.org/>. *Apache*.
20. [www.xml.com/](http://www.xml.com/). *XML*. [cited.
21. <http://www.web3d.org/>. *X3D*.
22. Merleau-Ponty, M., *Phenomenology of Perception*. 2002: Routledge Classics.
23. <http://www.evl.uic.edu/cavern/sage/index.php>.
24. Open\_source. *Netbeans*. 2008 Available from: <http://www.netbeans.org/>.
25. Bitmanagement, *BS Contact VRML/X3D*
26. <http://puredata.info/>. *Pure Data (PD)*.