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THE MEMORY MACHINE: SOUND AND MEMORY AT THE BRITISH MUSEUM

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Abstract

The Memory Machine is a context, people and site specific interactive sound installation. It has been developed as a collaboration between two composers, Cathy Lane and Nye Parry who share an interest in sound, oral history, and memory. The Memory Machine is an ongoing project, which, at the time of writing, is part of the British Museum's 250th anniversary exhibition entitled The Museum of the Mind; Art and Memory in World Cultures.

Visitors contribute to the Memory Machine by leaving a memory via a telephone situated in the main part of the exhibition. These memories become part of an ever changing soundscape which mixes the personal memories supplied by the visitors with archive material . As they play back the memories are fragmented and transformed with different kinds of musical and sound manipulation processes and the result is heard in multi channel playback at the entrance and exit to the exhibition. This memory mix may stimulate and unlock other personal memories which will either be fed back into the Memory Machine or stimulate a mental space for reverie and remembering, stimulated by power of sound.

The paper discusses the background and ideas behind the Memory Machine within the context of the composers' work. The development of the project in collaboration with the British Museum is described and an evaluation of some of the issues around the public exhibition of the piece is given as well as a full technical description of the different elements of the installation.

Keywords: Interactive, Sound Installation, Oral History, Memory, British Museum.

Introduction

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The Exhibition

The Museum of the Mind; Art and Memory in World Cultures opened to the public in April 2003 and closes in early September 2003. The exhibition is curated by Prof. John Mack and is a major part of the museum's 250th Anniversary celebrations. Consequently the objects on display have been drawn from all of the Museum's collections, from many times and many places. They have been chosen because of the way they embody memories: cultural, personal, institutional. They are " designed to help the different parts of mankind to remember: Arms against oblivion."
(MacGregor in Mack, 2003 p.9)

In addition to the role the objects play within their original contexts, the exhibition celebrates the role the objects play within the context of the museum:
… the Museum has been in existence for longer than most nation states. It has therefore acquired its own cargo of memories and persists in the memory of its vast numbers of annual visitors, for many of whom it is a place of pilgrimage."
(MacGregor in Mack, 2003 p.9)
The exhibition is free and is housed in the Joseph Hotung Great Court Gallery, an exhibition space above the historic Reading Room within the new Queen Elizabeth II Great Court, designed by Norman Foster and opened in 2000. It is divided into five sections that explore how the creation of objects and images help to shape and sustain memory. The sections are: The Museum as a Theatre of Memory, dealing largely with the history of the British Museum; In the Mind's Eye – aides memoir exploring how objects are created to awaken memories and contain narratives at many levels; Living Memory which illustrates some of the many ways in which memory has been kept alive by the

creation and manipulation of the human image; Commemoration memorial and ritual art and Holy relics and memorabilia.

The Memory Machine at the British Museum

The Memory Machine is a sound based installation, heard at the exhibition's entrance and exit. What is heard is a constantly changing mix of layers of spoken word material, some recorded in advance of the exhibition, from people who work at the British Museum and people in some way associated with some of the objects on display, and others recorded over the duration of the exhibition by visitors themselves. Visitors use a 1950s style telephone in the exhibition area to contribute their own memories to the mix.
The memory mix is constantly changing. The density of voices, the spatialization of each individual memory excerpt over the three loudspeakers in each listening space, the choice of voices and the mix of visitor memories with staff memories, the degree of intelligibility of any given voice and the degree of fragmentation or decomposition of the recording, all these are in a constant state of flux and the playback is never the same from one moment to the next. This creates a collision of words and ideas around the subject of memory and the museum, and provides an aural metaphor for workings of human memory itself.
Sound and Memory

The most commonly found relationships between memory, history and sound fall into one of three categories:

Historical reconstruction

This often involves the aural reconstruction of soundscapes of times past or of specific historic events. Historical reconstructions can be found in museums as well as in sound designs for radio, theatre and film and are primarily concerned with the accurate, or at least the illusory reconstruction of the soundscape as it might have been experienced at a particular time and place.

Sound archives

R. Murray Schaffer starts his study of our changing sonic environment The Soundscape: our sonic environment and the tuning of the world with the lines:
"The Soundscape of the world is changing. Modern man is beginning to inhabit a world with an acoustic environment radically different from any he has hitherto known"
(Schaffer, 1977, p.3)

Despite the many changes in the world soundscape and its consequences for us, the existence of archives that document changes in sounds and the soundscape over time are still relatively uncommon.

Later in the book Schafer reveals his fear that sound artefacts are disappearing and with them a large slice of out history and our heritage:
"One practical task of the acoustic designer would be to draw attention to soundmarks of distinction and, if there is good reason to do so, to fight for their preservation. The unique soundmark deserves to make history as surely as a Beethoven symphony. Its memory cannot be erased by months or years. Some soundmarks are monolithic, inscribing their signatures over the whole community. Such are the famous church or clock bells, horns or whistles. What would Salzburg be without its Salvatore Mundi, Stockholm without its Stadhuset carillon, London without Big Ben"
(Schaffer, 1977, p.239)

The relatively recent ability to record sound has meant that the changing soundscape and the individual sounds in it can be captured for posterity. Comparisons may be made and recent history can be listened to as it "really" was. Motivations for this may be environmental, political or historical. In addition an archive recording can be a trigger for personal memory. The sound of a long disappeared bell, factory whistle or ticking mantelpiece clock can be the key to unlock unexpected memories take many people from a variety of backgrounds back to the place of the youth..
" …and frequently the memories of older people about the sounds of the past are amazingly vivid even after decades. The way in which sounds are stirred in memory, not separately but in association with their original context, betrays a fundamental aspect of the listening process"
(Truax, 1984, p17)

Oral history archives

The recording and archiving of personal memories is often conducted by museums, libraries and public archives and community groups. These personal individual recollections often contain information about how things felt to individuals but are often an overlooked and underused resource. As well as containing information about past events, recorded reminiscences contain information about the speaker. Accents, turns of phrase and para–linguistic utterances are as informative as the stories themselves and over the years become as indicative of time and place.

Each of these categories has great potential for the sound artist and each has been used by the authors of the present paper in the past.

Oral History as material – The Memory Machine in Context

The Memory Machine is the product of a collaboration between two composers, Cathy Lane and Nye Parry and draws together their interests in site specific sound art, electroacoustic music composition, speech-text composition, interactive participatory sound work and sound materials which may refer to aspects of memory and the historical past. Prior to the development of the Memory Machine both composers had completed projects using archive material in various forms.

Nye Parry's Boomtown (1998) uses material from the North West Sound Archive consisting of interviews with residents of Oldham and its surroundings. In it the listener experiences a poignant identification with the events occurring around the Peterloo massacre according to the information given in the form of personal testimonies. The piece is 'framed' with the obsolete sounds of the textile mills and their associated machinery. It offers at once an insight into the distant past and a requiem for the more recently disappeared industry of the North.

Cathy Lane's The House of Memory is a multi - channel sound piece inspired by aspects of growing up in Hackney, East London in both the past and the present. The piece mixes sound material from the oral history collections of the Hackney Archives and the Hackney Museum with present day recordings made with, and of, Hackney children - particularly

of playground games and chants. The sonic imagery and music in the piece is designed to create a mental link to each listener's own childhood memories and feelings about growing up.

To a composer, the disadvantages of working with this sort of material can be that while it covers a very small period of time or specific areas of interest, there may actually be hours of material, which may not be very well catalogued. It can be of extremely poor sound quality, and it may not contain material that you had originally hoped to access. In some cases material cannot be accessed as it is deemed sensitive (This was the case with an existing archive of interviews with British Museum staff).

In other cases you may be sure that the required material exists, but it proves very difficult to track down. The advantages however are of access to a great wealth of material from the past with the concomitant language, patterns of speech and access to memories from other places and periods of time.

Sometimes new "archive" material will need to be created for a particular project. In The House of Memory for example, the available oral history material did not initially provide the range of content that the composer had hoped for and once she had decided on the basic theme, children's games, it became necessary to record new material. Sounds of contemporary children playing and speaking were included both to avoid a sentimental sonic portrait of a lost past, and to produce more variation of voices, so as to reflect more accurately the ethnographic make up of East London.

Oral History in the Memory Machine

The Memory Machine develops the idea of composing with oral history by, itself, collecting the material it uses. Listeners are stimulated to remember by listening to the mix of other peoples reminiscences and are then invited to contribute their own memories. A kind of feedback loop is created in which the listeners are also participants in the composition process.

Heard content and the stimulation of memory

One of the purposes of producing work relating to sound, history and memory is to try and stimulate recollection or remembering in the listener. The Memory Machine relies upon the listener feeding their own memories into the ongoing sound piece. These contributions are given in response to the heard material and become part of that material in turn triggering memories in others.

An earlier version of the Memory Machine used specially selected archive materials to stimulate memory. This first manifestation of the Memory Machine was developed for a sound art exhibition as part of the Cybersonica festival in 2002. It was situated in a central London Gallery space and open to a general audience and a more specific sound art audience who were attending the associated conference.

In this version of the Memory Machine archival material was released into the sound mix when the user answered an on - screen question about the year they were born and picked a theme from a choice of four categories. These were: Friends and Family, Technology, Arts and Entertainment and World Events.

A questionnaire had revealed that the sort of things people remembered most clearly were specific songs, TV programmes and theme tunes, extracts from speeches or newsworthy events of the times. The questionnaire was designed to identify the significant occurrences of the century for different age groups, and the soundmarks associated with them. These formed the basis of the archive material included in the first Memory Machine.
On hearing material that we hoped reflected the collective memories of the audience, based on their age and chosen subject area, listeners were then invited to leave a memory of their own. So the MM1 was using specific archive material reflecting collective cultural memory to trigger personal memory.

The Museum Context and the Stimulation of Memory

Unlike this first Memory Machine, the Memory Machine at the British Museum has a very specific context. A specific question is asked of the participants: “Please tell us your memories of the British Museum and its Collections” All the reminiscences deal in some way with this topic. The role of archive material in triggering memories and associations is therefore replaced to a large extent by the memories already present in the mix when listeners enter the exhibition space.

However the visitors’ memories are not only provoked by the memories of the other participants, but also, importantly, by the exhibition itself, which draws on all the collections of the museum and includes archival material about the history of the museum in one of its sections.

The absence of the musical archive and sound effects of the first Memory Machine produces a speech driven aesthetic in which the content of the visitors’ contributions is emphasized. The musicality of the experience is engendered by the texture of the voices, the accents, the hesitations the turns of phrase, as well as by the processing which is applied to the fragments by the computer.

Memory and Musical Structure

This musicality plays an important part in the way the Memory Machine represents processes of human memory. Rather than taking a narrative paradigm as a storyteller might, the Memory Machine applies musical processes to the material it gathers. Sounds are fragmented and echoed, repeated and varied, juxtaposed with both similar and unrelated fragments. This way of looking at structure offers a useful analogy to the processes of memory, in which networks of meaning interact and complex connections between ideas link seemingly disparate elements.

There are of course many historical precedents for this view of memory and these have to a large extent informed the thinking behind the Memory Machine itself as well as informing the Museum of the Mind exhibition.

Memory Theatres and the Structure of Memory

The cross disciplinary study of memory has come up with a variety of models and metaphors for the workings of memory and as aids to memory and remembering. While most of these are outside the scope of this paper, the concept of memory as a schematic or architectural space as expressed in the Renaissance Memory Theatre has been extremely influential on our work.

The concepts and ideas behind the memory palaces and memory theatres of the past have been investigated in Frances Yates book The Art of Memory. Generally, the memory palaces and memory theatres documented here were sophisticated spatial mnemonic systems built in the mind of the person who wished to remember though they were occasionally presented in physical form as in the famous Memory Theatre of Guilo Camillo, which in turn had a profound effect on the development of the modern museum. The Memory Palace was a place in which you would locate certain objects. These in turn were associated with ideas you wanted to remember. As you walked through your palace you would visit each object and recall the concept or a chunk of text associated with it.

The objects had to be chosen very carefully

"The images chosen to decorate the various memory theatres of the sixteenth century were neither simple nor arbitrary. They were carefully constructed visual images. Thus, they were not mere 'reminders' constructed as a convenient means to retrieve semantic knowledge stored in the memory; instead they were designed to embody and depict the knowledge they represented. They were 'maps' - things designed to represent other things."
(Fentress & Wickham, 1992, pp 12 - 13)

If one of the purposes of producing work relating to sound, history and memory is to try and stimulate recollection or remembering in the listener, then this kind of embodiment and depiction of knowledge through symbolic means is something that the composer seeks in both the sonic material and its organisation. The spatial or architectural metaphor of the Memory Palace finds a close ally in musical structure:

"Our ability to recall and fantasize in spatial and acoustic images ... shows that sensory memory of space and sound is no less conceptual than our abstract memory of meanings. Space and sound characterise the world as we represent it to ourselves in our imagination in a way that smells, tastes, and feelings do not."
(Fentress & Wickham, 1992, p.31)

As composers we have emphasised the spatial qualities in our work to produce sonic memory theatres for others to wander thorough, either literally or metaphorically. The musical work can be seen as a journey through a sound space. Personal memories and associations are triggered in the minds of the listeners – both in response to the material and to the structural arrangement of that material. The Memory Machine in this context becomes at once a sonic analogue of the museum itself: "a place where the products and processes of history meet". (Kavanagh, 2000, p.148).

The development of the Memory Machine

The decision to focus entirely on visitor memories and interviews was made during the development of the piece in close consultation with the curators. Other archive material was initially considered. The sort of material that we had wanted to trace included items such as British Broadcasting Corporation reports of major treasure hordes, such as the early seventh century treasures from the Anglo-Saxon ship burial site at Sutton Hoo discovered in 1939, or the tremendous and unexpected success of the treasures of Tutankhamun exhibition which 1, 669,117 visitors saw and "queuing for Tutankhamun became the fashion" (Caygill, 2002, p.64)

Whilst the museum itself owns a good deal of photographic material, oral history material proved much more difficult to locate. Other material was sourced or recorded, for example sounds from inside the museum and musical extracts related to the cultures represented in the exhibition as well as examples of memorial sounds and lost sounds, but these were not included in the final version.

Instead we worked with the Museum to create a special archive for the installation consisting of interviews with a variety of people suggested by John Mack the curator and his staff. These interviews include curators from different departments at the British Museum, focusing on the objects on loan from their department to The Museum of the Mind and providing a contextual or anecdotal background to the item which may include details of its inclusion or acquisition. Other interviewees included an archivist, a conservator, someone from visitor services and the head of education as well as other employees of the Museum such as the Head of security and members of his team.

Further material is provided by interviews with people who have special relationships with objects in the exhibition: a representative of the Kuba kingdom from the Congo whose ndop sculpture is a sophisticated mnemonic linking the Kuba to their past, and Osi Audu, a Nigerian artist, who contextualises and explains the background to his work Juju which is included in the exhibition.

Some of this material is always present in the sound memory mix and is heard as sonic fragments documenting a deep fascination and engagement with both the museum and the objects in it.

In the light of this material there was debate about the nature of the question that the visitors would be asked to elicit their memory. This came down to one of two choices. At first we favoured a question about an objects owned by the visitors, which had particular memories associated with them, as we felt it would elicit very personal responses and emphasize the link between objects and memory. In the end it was decided to focus on memories of the museum itself and its collections. This was felt to reflect the link between the museum and memory and forges a closer link between the institutional interviews and the visitor contributions.

Responses to the question “What memories do you have of the British Museum and the objects in it?” have elicited some surprising responses ranging from memories of elicit liaisons: “I meet my lover at the British Museum”, to childhood visits and deep engagement with particular items. Contributions can be in excess of 100 a day and the

recordings will form a useful archive for the British Museum which may provide the basis for future work.

File censorship

The issue of censorship is a difficult one in the context of the Memory Machine. The museum insisted on retaining the possibility of blocking certain contributions in case of obscenities or libellous statements. While these problems are relatively rare, many users have left messages that were not relevant to the question being asked. It is notable that a number of visitors have interpreted the telephone as a "visitor feedback" device, and left general comments about the exhibition (eg. "I like the exhibition very much") rather than leaving their own personal memory of the museum. Others have simply expressed incomprehension, some attempting to dial a number or saying things like "what do I do now?" In terms of the clarity of meaning in the sound installation it has proved very useful to be able to filter these statements out and to focus on genuine reminiscences which do constitute the majority of the contributions.

In addition to the explicit censorship of contents the Memory Machine automatically filters contributions of under 3 seconds. (The signal from the phone is delayed by 3 seconds and the recording is only initiated when this amount of time has elapsed.) This filters out the many instances when a visitor listens to the instructions but then decides to hang up without saying anything. It is suspected that many people will do this in order to hear the instructions before reflecting on their contributions, and may well go on to successfully leave a memory. Automating this part of the censorship process prevents curators having to actively reject a lot of false starts.

It is worth pointing out that rejected files are not deleted from the hard disk. The computer merely compiles a list of accepted files and marks rejected files as unsuitable. This provides researchers with the opportunity of investigating patterns of use and misuse by the public and may provide useful information to future exhibition designers.

There is of course a major down side to the censorship stage in the progress from leaving a memory to having it appear in the mix. It would be preferable in many ways to be able

to reward the user by letting them hear their own contribution as they leave the gallery. This would no doubt increase the user's satisfaction and understanding of the Memory Machine.

Technical descrition

The Memory Machine is implemented as a Max / MSP patch. Max/MSP is a graphical programming language for computer music applications developed by Miller Puckette at the Institut de Recherche et de Coordination Acoustique/Musique (IRCAM) in Paris from 1986. The present version of Max has been further developed by David Zicarelli. Max / MSP is currently only available on Macintosh computers. All aspects of the Memory machine are implemented in a single master patch with various sub – patches to look after the three basic functions: recording new contributions, auditioning and censoring material, and generating the constantly evolving sound mix.

These three functions correspond to three separate locations in the gallery, two of which are directly experienced by the public. The third is used by museum curators to audition the material gathered. The visitors hear the memory mix in the corridors leading in and out of the exhibition room and leave their own contributions in the exhibition space itself. The user's experience is therefore one of hearing first, contributing their own memory and then listening again on the way out. The following description by contrast follows the progress of the user's contribution from the user interface to the curator's control room and out into the sound installation in the corridors.

The user interface

The user interface is located in the main exhibition area and consists of a 1950's telephone. The users are prompted to leave a contribution by written instructions and by a voice on the telephone when they lift the receiver. Memories are left in the familiar manner of an answerphone message after a beep and to hang up when they have finished. The telephone has been adapted to contain a good quality microphone in the mouthpiece

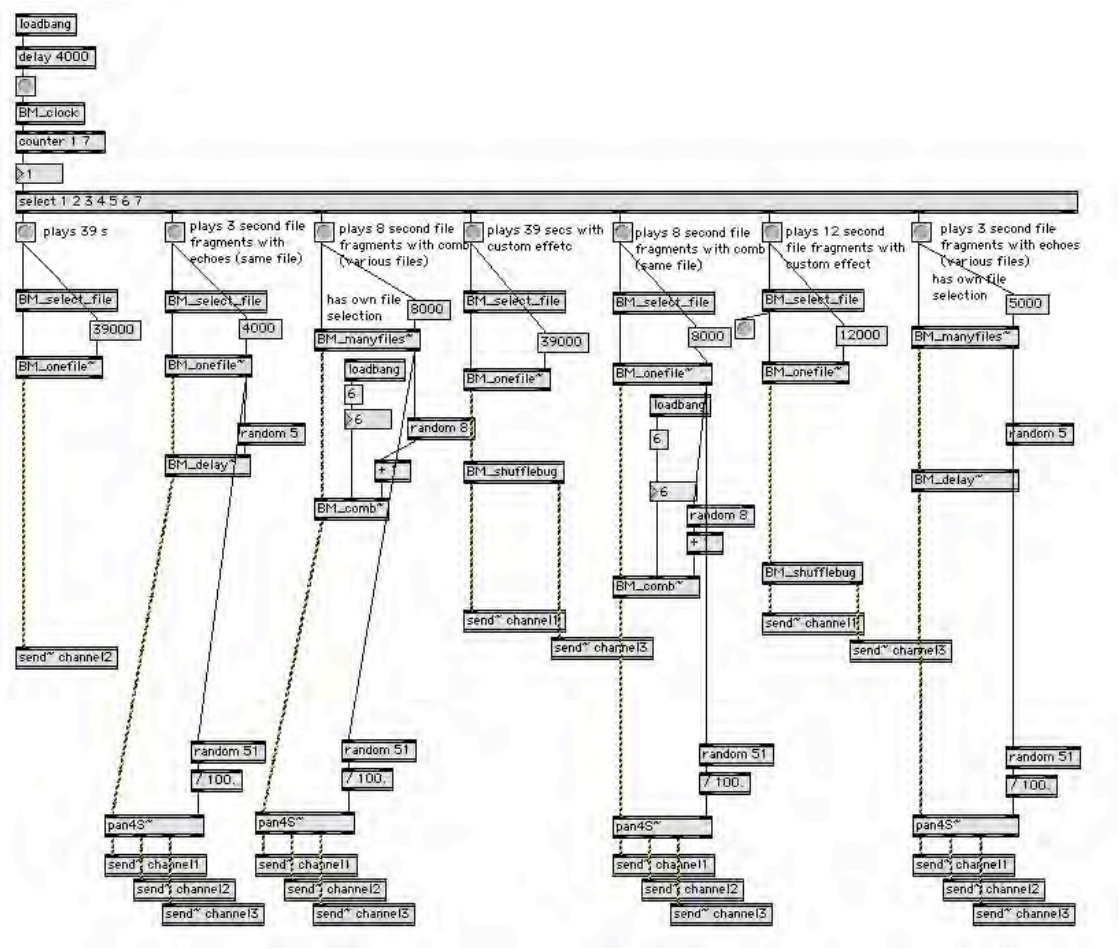
so that the recordings are of a high standard. In addition the phone sends a simple switch signal to the computer to indicate when it has been picked up and hung up. The computer interprets these as key presses via a Don Johnston switch interface, designed for special needs use. These trigger the instruction message and initiate and terminate the recording.

The control room

All recorded memories are kept as CD quality soundfiles on the computer's hard disk. Curators have the opportunity of auditioning the files in the small control room where the computer is stored. A simple graphical front end and a pair of headphones are provided for this purpose. Files are indexed by date so that the curator may audition the files received on a particular day. A play button plays the file and an accept and a reject button control which files will be allowed to enter the Memory Machine mix in the corridors. Curators audition the files regularly and may accept or reject a file while it is playing back, making the auditioning process quick and easy. The control room also houses an eight channel audio interface, the amplifiers, and a microphone pre – amp. An overall volume control and a hardware mute switch are also provided.

The audio installation

Accepted files are accessed by the playback functions of the program along with pre-recorded interviews with museum staff. Playback is identical in the two corridors which each contain 3 loudspeakers suspended from the ceiling. Individual files are positioned in a 3 channel mix to enhance comprehension and to allow various spatial effects. Different voices are presented at different stages of "decomposition". It was important to try and present highly comprehensible material along side more fragmented sound as the majority of visitors pass through the area very quickly so a more gradual process of decomposition would not be appreciated. It was also considered desirable to mix visitor memories with staff memories of the museum in about equal measure, reflecting both institutional and private experiences. The composition of the sound mix is controlled by the file selection and playback.



Lane_fig1. Max/MSP patch showing the seven playback channels

The playback routines

The playback patch consists of seven “channels” which each have a different way of treating the soundfiles they handle (Fig. 1). The channels are invoked one at a time in sequence 1 – 7 and back to 1. This is controlled by a central clock. Every 12 seconds a channel comes into play. A channel remains active for about 40 seconds so there are always three or 4 channels active at any one time. The channels have the following characteristics:

Channel 1 - plays back a 39 sec chunk of a single file (or the whole file if shorter)

Channel 2 - plays back 4 second fragments of a single file through a delay effect

Channel 3 - plays an 8 second chunks from various files through a comb filter effect
Channel 4 - plays a 39 second chunk from a single file through a custom effect
Channel 5 - plays 8 second fragments from a single file through a comb filter effect
Channel 6 - plays 12 second chunks from a single file through a custom effect
Channel 7 - plays 5 second fragments from various files through a delay effect

This set of options ensures that :
1. a long section of relatively easily comprehensible text is always in the mix (ch 1 and 4)
2. a good balance exists between different effects (comb, delay)
3. a good balance exists between long and short file fragments
When fragments are taken from a single file, the file is cut into sections and these are re – ordered. There is a random delay between each fragment and each fragment is different.

File Selection

All but two of the channels deal with a single memory file. The selection of this file is handled by a routine which decides whether the file should be a pre – recorded interview or a visitor memory and decides whether the file should be a new one or a file already present in another channel. The pattern is as follows: V I V r I V I r, where V is a visitor memory, I is pre-recorded interview material and r is a repetition of the previous file. As 5 of the playback channels call the file selector which has an 8 step pattern, the file selector is out of phase with the channels, thus ensuring that different effects and treatments are applied to each file type e.g. interviews don't always get delay effects. The purpose of the repetition in the cycle is to allow two versions of the same file to coexist in the mix at the same time. It was felt that the listeners who are only in the listening area for a brief time would get a clearer idea of the process of fragmentation process if for example delayed fragments of a file (channel 2) coexisted with a longer section played straight (channel 1).

Effects

The effects used are quite simple.

1. Delay:

The delay produces discrete echoes. A feedback loop produces the characteristic dying away of the effect. The amount of this effect is varied randomly.

2. Comb filter:

The comb filter produces a pitched quality by resonating at certain pitches when excited by the speech input. Various tuned chords have been programmed and are selected randomly.

3. Custom effect

The third effect uses a quirk in the Max / MSP program to produce a simple fragmentation. The effect causes a spatial illusion in which normal playback of the file in the centre of a stereo image is interrupted by occasional echoes and pre – echoes on the left and right.

Sound Diffusion

After going through the various effects the files are allocated a position in the spatial mix somewhere on the line between the three speakers above the listeners' heads. (The custom effect is routed directly to the outside pair to allow the stereo illusion to work). The three channel panning is achieved using a quadraphonic pan effect and restricting the output to 240 degrees of a notional circle.

Evaluation and development

The Memory Machine is part of an ongoing collaborative practice based research project into sound, history and memory. Part of that project is the making or composition of sound works which use as many of the available elements, sources and techniques identified above as possible. These will include historic reconstructions based on

researched evidence, archived sounds, soundscapes and testimonies, reconstructed and musically structured with attention to metaphorical and actual space.

The Memory Machine combines the gathering of oral history material with its presentation in a unique context. Developing the Memory Machine in conjunction with the staff at the British Museum was a fascinating and enjoyable experience and we are keen to continue this kind of partnership with organisations or institutions providing new contexts for the work and new arenas for the exploration of sound and memory.

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