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# Networked Music & Soundart Timeline (NMSAT): A Panoramic View of Practices and Techniques Related to Sound Transmission and Distance Listening

Jérôme Joy and Peter Sinclair

*In 2008, Jérôme Joy initiated the ‘Networked Music & SoundArt Timeline’ (NMSAT)—a monitor on the history of networked music and sound. The Timeline is maintained by the NMSAT Development Committee, consisting primarily of researchers and artists from partner institutions. The team is complemented by a pool of authors and editors contributing to Locus Sonus’s projects (such as, for instance, members of WLP – World Listening Project) and individuals who are part of other collaborative projects. The Committee has two major objectives: to amend and expand the existing database comprised currently of more than 2,000 entries and approximately 550 reference articles (NMSAT v.1.090319, March 2009); and to support the online technical and editorial development of the project. This article describes the current state of the timeline and the way in which it has been structured, as well as its evolution towards an open resource database accessible through a variety of specialized interfaces. NMSAT is part of the Locus Sonus research program and provides an essential historical backbone to practice-based artistic research and the exploration of developing technologies.*

*Keywords: Networks; Audio Art; Networked Music; Timeline; Database*

## Introduction

The Networked Music & SoundArt Timeline (NMSAT) aims to provide an overview of practices and techniques in the realm of networked music and sonic performance from ancient history to the present. It proposes a collection of references to theoretical and critical texts offering a valuable resource made available to actors in

the artistic and scientific spheres. It is also a platform for the development of studies and analytical projects. NMSAT is structured as a database. Each entry or item contains a short description followed by references (links, authors, bibliographical sources, etc.). The current version of the database consists of these items classified chronologically.

In order to cover the nominated area of interest (networked music and audio art) in a comprehensive way, references to significant events in the related and peripheral domains are essential. However, we are taking into account the fact that these domains are already well-documented in other historical compilations, available online and in corresponding literature (Barbosa, 2003; see also Joy, 2003–2005). NMSAT encompasses various domains and types of events including: technologies and software; forward-thinking literature; musicology and ethnomusicology; sound anthropology and history of telecommunication and radio; and contemporary music and soundart.

#### *Research Context (Locus Sonus)*

NMSAT is part of Locus Sonus's research into audio art (Joy & Sinclair, 2008; Sinclair, 2007). Locus Sonus's current research agenda and artistic production is organized into two main axes—networked sonic spaces and field spatialization—which combine local and remote spaces.<sup>1</sup> Part of our mission is to keep up to date on, or indeed to update, the nascent art form that audio art represents, situated as it is at the intersection of what have been considered, at least until recently, as separate art forms (visual arts, music). Locus Sonus's research revolves around a pool of artistic and technical experimentations, practice-led and verified through public presentation. Many of these projects are based on streaming techniques, exploring the interlacing of space and distance and the modifications that ensue: related to synchronous and asynchronous temporality, spatial qualities (local, remote, geographically situated) and resulting structures (*autophone* and *chronotope*).<sup>2</sup>

Intrinsically transdisciplinary in nature, artworks evolving within the Locus Sonus research group often refer to other disciplines such as philosophy, sociology, landscape design, computer music and telecommunications, all of which will need to be accessible, in a limited context, via NMSAT. Methodologies employed in the development of NMSAT are based on the needs of audio networked experimentations as well as on the contextualization and analysis of such practices. Resources developed within Locus Sonus are designed to be made available to art education and research establishments in general and to scientific collaborations in the field of study. The NMSAT project stems from previous research on the 'organology of netmusic', which began seven years ago (Joy, 2003–2005). The initial goal was to provide an historical and prospective framework for research on networked audio art.<sup>3</sup> However, it has subsequently nourished development of various projects and artistic proposals, which go beyond a purely documentary approach.

Additional theoretical research led by Locus Sonus includes a study on the Locustream's open-microphones (Joy, 2007a), a remote sound recording study (Joy, 2007b), a study on streams and audio-topy (Salmona, 2008) and a survey on

‘geotagged’ sound projects—soundmaps and soundwalks (Joy, 2007c). These, along with practice-based experimentations, have allowed the development of a more pertinent analytical framework, which today constitutes the theoretical structure of NMSAT.

#### *NMSAT Development Committee*

It has become apparent that an international, multidisciplinary and collaborative approach to the development of NMSAT is highly desirable. Indeed, the vast amount of data to be collected or monitored, the diversity of its origins and the rapidity with which it evolves make this approach a practical necessity. This has led to the creation of the Development Committee of NMSAT, whose role is to: develop systems to evaluate, verify, validate and amend collected information; continuously update the database; minimize the effects of biased perspectives on historical approaches; and cultivate a diversity of different approaches.

To ensure that NMSAT will be continuously updated following the release of its current version (1.0), it will be made available as an open resource for external contributions, editable by peers who share similar or complementary research objectives. In 2010, the objective will be to introduce an online database enhanced by multiple contributors and connected to a variety of navigation interfaces (version 2.0, XML/PHP/mysql structure). Given the hybrid nature of the proposed information, the idea is to build multiple and configurable interfaces to access the database. This in turn will offer various possibilities for navigation and editing, and will greatly increase its usefulness among researchers, artists and musicians.

#### *The Current Form of NMSAT*

The current form of NMSAT (version 1.0), publicly available from 2010, is a compilation of entries from various online and bibliographical documents, articles and workshop notes, organized in chronological and alphabetical order. A linear textual format is used for reasons of simplicity. The panoramic view is divided into two parts. Part One concerns early history and literature up until the 1960s, and Part Two is a list of works and references from 1950 to the present. It is complemented by Part Three, which is an alphabetical list of scientific papers and publications. Data mining methods and hypertextual monitoring are used to research and collect information. Though unambitious in its form, this methodology has proved useful for the creation of a collection of significant references.

### **Methodology**

#### *Documentary Monitoring: Methodology*

NMSAT is conceived as an historical collection and a pool of information, with a list of items chronologically classified by period and date. It offers an instantaneous

perspective on the occurrence and chronological appearance of events and identified items over time. The collection has become a vast resource of references. The objective is to open its structure in terms of navigation and participation. A collection of documents presents an hermetic and more or less linear structure comprising a list of items, which can only be updated at a given time. Our aim is to modify the intrinsic structure of NMSAT so that it becomes easily accessible to external contribution, modification and navigation.

The fact that NMSAT covers different areas of knowledge within the context of networked audio suggests the use of different approaches to accessing and navigating the database. Among these different approaches we have identified the following: contemporary music and audio art works from a telematic and collaborative viewpoint; and sonic art, audio art and music systems and works in which the notions of 'space' and 'place' are significant (soundwalks, soundmaps, locative sound, sound practices related to walking and ambulation, site-specific art (in-situ), phonography, field recordings, works involving interconnected sites, etc.). It includes significant works, events and historical benchmarks in:

- digital and interactive art: net-art, telepresence art, sociological art, tactical media art, art and communication, art and transmission, variable media and so on, and in the sonic art domains: radio art, sound poetry and so on;
- contemporary art: conceptual art (issues of place and time), minimal and antiformal art (issues of new and extra-visual perceptions), sociological art, land art and site-specific art, performance art, process art, net-art, art + com, contextual art and relational aesthetics and so on;
- technologies (software and hardware): developments in the Internet and data transmission, robotics, digital music, telematics and so on;
- social phenomena as reviewed by sociology, philosophy and aesthetics, and related to music and art in digital context: online networks, broad- and narrow-casting contexts, social networking (with or without the Internet), ethnomusicology and sound anthropology and so on (Becker, 1974, 1982; see also Cristofol, 2005–2008; Joy & Argüello, 2005);
- historical, modern and contemporary literature: early scientific publications, forward-thinking and anticipatory literature, science fiction and so on.

The monitoring methodology is based on the use of keywords in search engines (Google, Google Scholar, In-Extenso, Citeseer, Scirus, Scitopia, FindArticles, Cybertheses, MIT OpenCourseWare, INIST-CNRS, etc.) or references and quotations from documents available online (websites, forums, mailing lists, webrings, etc.). Compiled information is tested and cross-checked using various sources and methods in order to establish its validity before inserting it into the database. Websites such as turbulence.org and online reviews are valuable sources of information and are continuously consulted. They can also be used as references in starting an inquiry, and as 'reservoirs' and repositories of information on current events and recent history.

The NMSAT monitoring committee also consults and identifies references in other types of publication (books, articles, reviews, event programs, proceedings, newspapers, etc.) to extract information that may constitute a timeline entry. Bibliographies, footnotes and quotations that are listed in scientific articles and books, and in almost all publications, are crucial in the development of entry references and of semantic arborescence and navigation between information sources and the registered entry. The validation of each NMSAT entry depends on it being evaluated as consisting of an informative and pertinent summary plus webographic and bibliographic references. The aim of this validation is to ensure that the database remains an exact source of information.

Entries have been formatted according to established editing rules and with a view to homogenizing contents. Thus the chronological organization of items has led to the development of a writing protocol: year, reference title, author(s), place, description, quotation sources, bibliographical links and references. Each entry within the database presents a descriptive and informative summary from original and cited sources (websites, books, articles, conferences, essays, etc.). Author(s) and source references, as well as references to the selected text, are associated with each entry. Navigation within NMSAT is possible through linear text mode, through the use of a hypertext menu or via keywords in search engines.

#### *Fields and Structure of NMSAT (Version 1.0)*

The text is structured into three parts (Figure 1): ancient and modern history, anticipatory literature and technical developments ( $\infty$ –1964); artworks, technological developments and contemporary history (1951–today); and reference articles.

Part One of the collection features literature, philosophy, the history of telecommunications, musical and artistic references, and references to science fiction. It allows for comparison and development of perspectives concerning technological breakthroughs, literary and artistic utopias, and musical and sonic explorations. Major references related to communication and sound technologies have been included in this part in order to highlight their influence, even though they are not directly linked to our research interests. These entries are not exhaustive, but they provide a context for a better understanding of the advent of networked audio. We consider that it is important to take into consideration certain benchmark events of human and technical explorations from the second half of the nineteenth century onwards. Part One is structured in a linear and chronological manner and concludes with a visionary quotation from 1964 concerning the advent of electronic networks (even though the development of ARPANET [Advanced Research Projects Agency Network] started two years earlier). The quotation is notable in that it represents an emblematic shift in history, introducing the development of electronic networks such as the Internet.

Similarly, Part Two starts with a major reference from 1951: the first contemporary and artistic work that used live sound from a distant location (*Imaginary Landscape*

MENU		
1. ANCIENT AND MODERN HISTORY, ANTICIPATORY LITERATURE & TECHNICAL DEVELOPMENTS REFERENCES	2. NETWORKED MUSIC AND SOUNDART WORKS & TECHNOLOGICAL DEVELOPMENTS & CONTEMPORARY HISTORY REFERENCES	3. REFERENCE PAPERS (alphabetical order)
• ∞ - 90	<a href="#">go to bookmark</a>	
• 90 - 1000	<a href="#">go to bookmark</a>	
• 1000 - 1600	<a href="#">go to bookmark</a>	
• 1600 - 1700	<a href="#">go to bookmark</a>	
• 1700 - 1800	<a href="#">go to bookmark</a>	
• 1800 - 1835	<a href="#">go to bookmark</a>	
• 1835 - 1849	<a href="#">go to bookmark</a>	
• 1849 - 1860	<a href="#">go to bookmark</a>	
• 1860 - 1876	<a href="#">go to bookmark</a>	
• 1876 - 1884	<a href="#">go to bookmark</a>	
• 1884 - 1890	<a href="#">go to bookmark</a>	
• 1890 - 1900	<a href="#">go to bookmark</a>	
• 1900 - 1910	<a href="#">go to bookmark</a>	
• 1910 - 1920	<a href="#">go to bookmark</a>	
• 1920 - 1930	<a href="#">go to bookmark</a>	
• 1930 - 1940	<a href="#">go to bookmark</a>	
• 1940 - 1960	<a href="#">go to bookmark</a>	
• 1960s	<a href="#">go to bookmark</a>	
	• 1950 - 1951 - 1952 - 1953 - 1954 - 1955 - 1956 - 1957 - 1958 - 1959 -	A B C
	• 1960 - 1961 - 1962 - 1963 - 1964 - 1965 - 1966 - 1967 - 1968 - 1969 -	D E E
	• 1970 - 1971 - 1972 - 1973 - 1974 - 1975 - 1976 - 1977 - 1978 - 1979 -	G H I
	• 1980 - 1981 - 1982 - 1983 - 1984 - 1985 - 1986 - 1987 - 1988 - 1989 -	J K L
	• 1990 - 1991 - 1992 - 1993 - 1994 - 1995 - 1996 - 1997 - 1998 - 1999 -	M N Q
	• 2000 - 2001 - 2002 - 2003 - 2004 - 2005 - 2006 - 2007 - 2008 -	P Q R
		S T U
		V W X
		Y Z

Figure 1 Menu of the version 1.090319.

IV, John Cage). Part Two of the collection aims to provide a chronological list of artistic and musical works developed through networks, events based on network technology, significant references emanating from the observation of other subsidiary artistic practices and other domains. This observation also deals with socio-technical developments from the last 25 years of the twentieth century: electronic networks, communities of internauts, social networking, broad- and narrow-casting, geographically identified locations and so on.

Part Three of NMSAT presents a list of reference articles and workshops notes, proceedings from symposiums and international conferences and other publications in the form of a bibliography classified by names of authors, and the title and year of publication. This standard structure permits the insertion of references in other bibliographical lists and has the potential to facilitate research processes. It also provides information on the dynamics of development in the area of research over the past years. Unlike Parts One and Two, Part Three is organized in alphabetical order (Parts One and Two are structured in a chronological form, as previously mentioned).

#### *From Version 1.0 to Version 2.0*

The structure of the upcoming database and the nature of interfaces will be designed to integrate access to multiple navigation options other than a linear textual form.

This implies developing several types of consultation and spontaneous contribution by reviewers and researchers, defined by different types of fields in the editing window of the database, articles, annotation feeds, categories and tag series, internal links, multiple options of research fields and classification by internal engine, translation of entries contents, as well as visual navigation: graphic interfaces, tags inventory, and temporal, geographic and field classification.

Multiple forms of access will have a significant impact on the visual aspects and on the overall representation of the database, as well as on our conception of history and of the organic character of each domain. Because different cultures and conceptions influence the orientation of our work and our comprehension of the world, the structure of NMSAT proposes various means to access its database as opposed to a unique viewpoint. This is a challenge but one that we feel needs to be taken on. Within a chronological representation of history, as in blog-type structures, the organization of events creates a graphic and intellectual representation based on the singularity of each event and on a past-present-future linearity. Organizational principles such as anteriority, auctoriality<sup>4</sup> and geographical localization ('this event happened here' highlighting places and structures of organizations, or even perceived in *happenstance* as in 'to be there at the right time') remove each item from their respective contexts or at least place them in a limited and specific context (spatial, geographical and historical).

These principles do not render relations, correlations and intersections, and may at times create false ones. For instance, the principle of anteriority produces a cause-and-effect (or even consequence) linear comprehension between events that is not entirely faithful to reality and is often contradicted by observation. Linearity suggests that time is an imperturbable vector and distorts our perceptions of individual and collective decision-making processes, as well as conditions of influence such as one decision over another. Such processes and conditions are often influenced by intuition and individual logics, encounters, co-creation and cooperation dynamics extraneous to the notion of action considered as an isolated gesture.

Using a system based on a progression of events is not necessarily the best way to represent a collection of references (works, articles, events) over time. As we know, art does not evolve with inventions and explorations, but is inspired by contextual situations: shifts, leaps, environmental and incidental reactions, and sometimes individual decisions not to mention serendipity. To this effect, we aim to develop, in parallel to the publication of version 1.0, additional approaches based, for instance, on constellations of processes, social re-appropriations and combinations of fluctuating situations.<sup>5</sup> This, in turn, will allow for a more profound comprehension of historical situations and artistic and scientific decisions, and will provide new overviews of circumstances and events when navigating with multiple interfaces in the database. It is important to underline the fact that we continue to consider the linear version of NMSAT remaining a valuable and easy-to-use tool for documentation and research.

## Objective

With this original and versatile documentation system, collaborators and partners in the project will be able to rely on a continuously updated and expanding resource. Our interest lies in the development of new research and the exploration of correlations, classifications and concepts as related to networked audio practices and highlighted in the analysis of documents in NMSAT (such as, for instance, with the notion of ‘distance listening – internet auditoriums’, a research project by Jérôme Joy, and ‘using real-time flux in art – sonification’ by Peter Sinclair, and other research objects developed by artists and researchers within Locus Sonus). This resource proposes a continuous update on networked audio art, sonic art and music, while offering a time effective means to search for information in current events and in ancient or recent history. Simultaneously, it offers the possibility of following the progress of current projects in art and research and the impact of technologies used in audio-artistic practices.

NMSAT offers the opportunity to analyze interactions, modifications and correlations within the often fragile and controversial context that networked audio art represents. Through the observation of praxis and fiction, the objective of NMSAT is to unravel and discover links and connections between disciplines often seemingly unrelated or even hostile to one another. In addition, NMSAT allows for different interpretations of its content based on ‘thematic threads’ running through the collection and highlighting recurrent issues, such as environmental experiences and sonic landscapes, sense of place and field spatialization, the question of audiences and their place, distributed acoustic and telepresence, live composition and sound interaction, and reinstantiation<sup>6</sup> of reception and emission (embodiments of receiver and transmitter). A future objective of NMSAT is to progressively build an editorial platform, such as a *toolbox*<sup>7</sup> (Foucault, 1974), hosting works, critical analysis or other research projects stemming from the use of the database as a resource.

The development of this project by Locus Sonus will contribute to and support our ongoing collaborations: *Eu-phonie* (with SARC Belfast, CRiSAP LCC University of the Arts London, CultureLab University of Newcastle, LORNA Reykjavik, KIBLA Malibor, Le Hangar Barcelona, STEIM Amsterdam), *Audio Ambiances* (LAMES CNRS Université de Provence, CRESSON CNRS École d’Architecture de Grenoble, ENST/Telecom Paristech/Eurocom Sophia-Antipolis/EHESS), TransatLab *puf*—Franco-American academic partnership<sup>8</sup> (School of the Art Institute of Chicago SAIC), *Locustream* (in collaboration with communities of field recordists and phonographers such as WLP—World Listening Project).<sup>9</sup>

## Rationale and Future Work

Within the context of the rapid development of visual arts and musical forms, the specialization of networked audio art is of importance. Networked sound and music have historically constituted connections between areas of knowledge and development beyond individual artistic works or practice. They represent living interactions

and the construction between art and social domains within socio-technical contexts through the 'experiential' exploration of networked techniques and technologies, as well as through site-specific (in-situ) and time-specific (in-tempo) experiences of perception using distant action and sound transmission. Networks are unique in the sense that they allow real-time interaction and connections between places and influence our perception of time and space (Renaud & Rebelo, 2006).

NMSAT is concerned with networked audio environments perceived as changing, vibrating and organic 'eco-milieus' that foster collective creativity and significant modifications of environmental perception (Carlyle, 2007). This dimension further explores propositions mentioned earlier, and identifies within networked socio-technical contexts the development of cooperative creative systems and participatory dynamics (Tanaka et al., 2005). New dynamics re-model temporalities of individual attention and have the potential to reveal a new sound aesthetics (Joy, 2009). The social implication of these perceptions may stem from a new 'delivery of sensory reality' (Valéry, 1960 [1928])<sup>10</sup> and from the sharing of knowledge through action. The interlacing of the potentials of musical and sound composition and those of reactive and linked acoustic spaces is a breakthrough towards the realization of instrumental systems and protocols from networks.

The very notions of distance and permanence play primordial roles when exploring and building a musical and soniferous condition of electronic networks (the Internet) (Joy, 2009).<sup>11</sup> This perspective needs to be looked at under the prism of current approaches on the progression of the nature of 'audiences', acousmatic diffusions, participatory and cooperation systems, and on the notion of 'distance listening'. It is also about giving recent history new perspectives through the documentary structure of NMSAT and its interfaces.

Locus Sonus's intention is to explore networked culture and, on another level, our relations to technologies and socio-technical environments within a controversial debate of representation that has existed since the 1960s. Hyper-mediatization, as highlighted by Stiegler (1994–2001, 2004–2005, 2004–2006), the multiplication of technical prosthesis and so on reveal slow but progressive shifts in our lives, culture and society. We observe the fragility of our relationship to technologies. Beyond the simple notion of 'machinery' (i.e., a set of communicating machines) and the 'place' of the machines, networks need to be explored as an instrumental dimension at the intersection of milieus (physical and virtual), and as compositional, auditive and interpretational systems. Our initiative implies taking part in these current and vibrant debates so that we will actively contribute by proposing new hypotheses. Through the creation of NMSAT, we aim to pose questions and propose (shifting) points of view within a context of broader and better knowledge, debate, exchange and comparison essential to artistic and theoretical practices.

## Notes

- [1] This term was introduced by the authors. It combines the concepts of field recording and spatialization, generally associated with a fixed system in a closed environment (electro-acoustics).

- [2] '[P]oints in the geography of a community where time and space intersect and fuse', according to the anthropologist and linguist, Keith Basso (1988 [1984]).
- [3] With the help of a systematic online review including categorized and generic lists of bookmarks and links to access existing documents (Joy, 2003–2005).
- [4] 'Auctorality' may be studied under three principles: the production of documents by one or several authors; reception by the readers of the author in the document; and the link permitting someone to find the author and the document. 'Authority' is attached to auctorality by the link that may connect an author to a discourse or document (Broudoux, 2007).
- [5] E.g., the historical representation of geographical zones, which is as important as other representations for understanding active dynamics.
- [6] 'Reinstantiation' should be read here as the reconfiguration (or substitution) of instances, states and status that become updated and conditioned by contexts and objectives.
- [7] The term 'Toolbox' has been used in an interview between M. D'Eramo and Michel Foucault in 1974: 'Je fabrique—j'allais dire des machines, mais ce serait trop à la Deleuze—des instruments, des ustensiles, des armes. Je voudrais que mes livres soient une sorte de toolbox dans lequel les autres puissent aller fouiller pour y trouver un outil avec lequel ils pourraient faire ce que bon leur semble, dans leur domaine.' [I build—I was about to say machines, but it would be too much Deleuze-inspired—instruments, utensils, weapons. I would like my books to be something like a tool-box in which people could find a tool to do whatever they wish in their own domain] (Foucault, 1974).
- [8] Retrieved 13 April 2009, from <http://transatlab.net/>.
- [9] Retrieved 13 April 2009, from <http://www.worldlisteningproject.org/>.
- [10] 'At first, no doubt, only the reproduction and transmission of works of art will be affected. It will be possible to send anywhere or to re-create anywhere a system of sensations, or more precisely a system of stimuli, provoked by some object or event in any given place. Works of art will acquire a kind of ubiquity. We shall only have to summon them and there they will be. . . . They will not merely exist in themselves but will exist wherever someone with a certain apparatus happens to be. . . . Just as water, gas and electricity are brought into our houses from far off to satisfy our needs in response to a minimal effort, so we shall be supplied with visual or auditory images, which will appear and disappear at a simple movement of the hand, hardly more than a sign' (Valéry, 1960 [1928]).
- [11] While the Internet has generally been perceived as a space for communication and information until now, we stress the point that it can also be a space for creation. For instance, the streaming technique is only possible through the Internet and is one of the only techniques that permits the linking of spaces (which goes beyond information). As such, when we continuously link remote spaces, which is possible with the Internet through streaming techniques, and when we consider that sound and musical practices are by nature acoustic practices (revealing spaces by stimulating and diffusing sound in the air and exciting only when spaces are available), electronic networks could become networks of linked acoustic spaces (i.e., the musical and soniferous state of the Internet).

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