Adding voices to the world's polyphony: the role of technology in in-situ composition

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ABSTRACT

In this paper a context is sketched to understand the role and concept of technology in in-situ composition. First, background information is given on the history and the use of the terms 'site' and 'in-situ' music. Next, technology is situated within an art work which is sensitive to the immediate surroundings. These surroundings are considered as an instantiation of the complex, diverse and dynamic physical world. In a following part, this living world is interpreted as full of human and natural agency and therefore 'performance' and 'instrument' are crucial in on-site music and its technology. Finally, recent compositions of the author are described in which a 'distributed instrument' is created, integrating sound production, supporting technology and the site into one overarching instrument.

1. INTRODUCTION

Since more than 50 years in-situ compositions have been created for performances outside the concert hall in parks, woods, streets, factories, etc. On the one hand, current research on in-situ music is profound but limited in scope: it fails to recognize common themes because it focuses on *individual* in-situ works or composers, such as Alvin Lucier [1], Alvin Curran [2], Llorenç Barber [3] or R. Murray Schafer [4]. On the other hand, overarching studies are too general [5][6]: they also encompass sound art installations and concert-hall music (i.e. experimental, contemporary-classical music, soundscapes and field recordings) and thus miss the specific profile of in-situ music: the "notion of music-as-action-in-the-world"[7]. To fill this gap and structure the often fragmented information on in-situ music I rely on research on site-specific theater. Studies of Fiona Wilkie [8] and Mike Pearson [9] are the result of an extensive research tradition in site-specific theater studies and both present a comprehensive overview of topics, problems and concepts in site-specific theater.
In this paper I focus on one theme in in-situ composition: the use and concept of technology. I mainly explore the broader *context* and framework to understand the roles and notions of technology in these compositions. Next, I give a more detailed analysis based on my own compositions. I believe a study on in-situ technology is highly relevant and topical for contemporary music; relevant, because it reveals an ecological or situated approach with technology embedded in both an embodied instrument practice and a local place; topical, because the further miniaturization and mobility of electronic devices create new possibilities

for the artist to leave the concert hall, enter public and private spaces and act in and with the living world.

A short history of in-situ composition

The rich history of in-situ works, composed for performance locations outside the concert halls and usual artistic institutions [10] consists of two historical periods – or better 'waves' – : a first one starting around 1965, spanning two decades and ending with a fall of in-situ activities between 1990 and 1995 [11]; and a second one, continuing from 1995 until today. Three composers have produced an impressive oeuvre of in-situ works: Pauline Oliveros, Alvin Curran and R. Murray Schafer. Their in-situ works and practices continued for several decades across the two historical waves. Other composers such as Alvin Lucier, Trevor Wishart and David Dunn had – in different ways – been very active in composing and setting up performances outside concert halls between 1965 and 1985 but in the 1990s they were almost exclusively working inside concert halls, studios and research institutes. After 1995 new composers started writing works for various living performance sites. Examples are John Luther Adams (*Inuksuit*, 2009), Peter Ablinger (*City and Landscape operas*), Lisa Bielawa (*Tempelhof Broadcast*, 2013), Stephen Montague (*Apparitions*, 2008) or Craig Shepard (*Trumpet City*, 2009).

What is a site?

The vision on a 'site' and the interaction with it can be very diverse in in-situ music as there is no 'standard' site. Composers such as David Dunn, R. Murray Schafer, Robert Morris and Erik Griswold often see a site as a *natural* place with plants, animals and natural forces. The social, cultural and political dimensions of a *human* performance site are integrated in the compositions of Alvin Curran, Trevor Wishart, Llorenç Barber or Merlijn Twaalfhoven. For Pauline Oliveros the conscious relation between the (embodied) self, the other participants and the surroundings is crucial to realize a context-sensitive performance. This *relational* concept of a performance site, and its prominence given to listening, has become very influential after 1995, for example in in-situ compositions of Robert Blatt, David Helbich, Manfred Werder or Carolyn Chen. Finally, there is also a large group of in-situ composers that work outside the concert hall and focus on (artistic) sound and music. Topics such as the acoustics of spaces, the perception of sound (depending on place) or the performance and instrumentation possibilities of large spaces are explored. These composers consider a site as an *extended hall*. Their compositions were made for locations outside the usual concert hall but their concepts relate to experimental or contemporary-classical music in concert halls.

The term 'in-situ music'

The term 'in-situ music' is not a common one, in fact there is no standard denomination for music that is made to be performed outside the concert hall. Artists and researchers have used a long list of terms to describe similar or related music, to name but a few:
- *environmental composition*: used by R. Murray Schafer to describe his own work
- *site-responsive*: used by author/improviser Lauren Hayes to describe context-based live electronic music [7]
- *large-scale projects*: used by composer Stephen Montague to describe his in-situ work
- *live installation*: used by composer Craig Shepard to describe his *Trumpet City* (2009)

- *sound art situations*: used by the authors Sanne Krogh Groth and Kristine Samson to describe performances of Brandon LaBelle and Jeremy Woodruff in outdoor public spaces [12].

The term I propose – in-situ music – gathers all music that is made to be performed *in the direct presence of the living world*. In a performance the audience sees, hears, smells, feels or knows the living, physical world, which may consist of the wind, rain, acoustical phenomena, passers-by, inhabitants, local history, etc. In-situ composition is not the same as *site-specific composition* and performance (a term used by Trevor Wishart in the 1970s and also discussed by Hayes [7]). The latter term also encompasses music that is performed or played-back in a concert hall, even though the composition is based on a specific site outside the concert hall. Moreover, in-situ composition also encompasses the work of composers focusing on the relational aspects of a site. These 'relational' composers do not restrict themselves to one specific performance place. A search on the internet reveals how many and how various the (indoor and outdoor) sites are at which works such as Manfred Werder's *2005*[1] or Pauline Oliveros' *Rock Piece* have been performed.

2. SITUATED TECHNOLOGY

The use of technology in in-situ composition

Before proceeding to the roles and concepts of technology in in-situ composition, I take a short look at the various ways in which technology may appear. In in-situ composition technology may help:

- to listen to the performance environment in different ways with contact microphones, hydrophones, etc.
- to analyze a site's sounds or acoustic features, for example in David Dunn's *Entrainments 1* (1984) or Peter Ablinger's *Landscape Opera Ulrichsberg* (2009)
- to experience the environment – or the human relation to the environment – in new ways, for example by visualizing the sound vibrations or sound sources with microscopes or night vision cameras
- to enhance the performability and mobility of instruments by reducing their size and weight, including batteries or (musical) user interfaces as in mini-synthesizers, tablet computers, power banks, etc.
- to synchronize activities and create rhythms and entrainments (via wireless communication devices such as internet mobile phones or FM transmitters and senders as in Jose Maceda's *Ugnayan* (1974) or Kathy Kennedy's *HMMM* (2006)
- to produce sounds with audio synthesis or processing techniques fitting the surroundings [13].

Depending on these categories and their specific application in-situ music can be labeled as a technology-supported, live electronic, live computer or multimedia music practice.

Technology as part of a context-sensitive performance

In-situ technology is part of a work which is sensitive to the immediate surroundings. This context is crucial to understand in-situ technology. Composers and performers may add, interact, communicate, transform or simply reveal the surroundings but the sensitivity for the site is the starting point of an in-situ performance. Technology – as part of the performance – acts as a mediator between the environment on the one hand and the performers and audience

on the other. It is a tool for the performers – and the audience in a participatory composition – to deal with the present, ongoing world. The notion of the 'world' (or 'life') holds a central position in in-situ performances. It is a place full of vitality, diversity and indeterminacy, changing in time and with a different appearance and history in every place. "No world on stage but just life, and where I love to be" says composer Manfred Werder [14] and he certainly isn't the only in-situ composer expressing his love for the world. Technology does not have the main, principal role in realizing a meeting (= an in-situ performance) between people and the living world. The music that is played, the selection and staging of a site, the role of the audience, the hour and season of the concert: these are all ingredients to create a context-sensitive performance. To understand in-situ technology is to contextualize it as situated in the real world. But this situatedness is not an abstract issue, it operates within a specific vision of how the meeting will take place at one time and one place. This vision is made explicit in the scores, plans or documentation of an in-situ performance.

As the living, physical world is directly present in an in-situ performance, there is no urgent need to re-present the real world as in a soundscape, field recording or audiovisual concert in a concert hall. Of course, an artist can choose to add representations to a site but if (s)he wants to focus on birds for example, (s)he does not need to use audio or video recordings of birds or refer to the birds with speech/text. Moreover, physical reality is multisensorial, with individuals and species having their own interpretations (of this reality) and acting according to different intentions and needs. The direct link with the surrounding polyphony of the world makes in-situ technology different from the usual concert applications. For example, take sound amplification and spatialization. Within a situated view on technology, amplification is not meant to sound louder than the surroundings, overrule them, as in an open air pop concert, or create a full sound in an otherwise silent concert hall. Smaller and less powerful speakers can be placed in trees and various locations to integrate the performed sound (through the speaker) with the acoustic sounds at one particular spot. Compared to concert hall music, the decision on the direction and movement of sound and performers (spatialization) is a multifaceted, artistic problem in in-situ music. In the hall multiple speakers try to replicate 'natural, moving' sound within an autonomous, technological sound world. In-situ spatialization displays a wider array of solutions, such as performers on sailing boats (in Alvin Curran's *Maritime Rites* cycle (1970s - now), masses of performers (*Crissy Broadcast* (2013) of Lisa Bielawa, even hundreds to thousands of performers in *Udlot-Udlot* (1975) of José Maceda) or performers exploiting the acoustic filtering or reverb of a site's architecture (in my own *Hearizon* (2016)). Moreover, spatialization may exploit extramusical interpretations of a site. For example, if a harbor or factory is visible at one side of a performance site, a composer may choose related music, sounds or actions to be played at that side.

Active relationships and performance

As said, in-situ technology concerns creating sensitivity to the surrounding, living world. This world is not static. In the works and texts of in-situ composers the world – and its specific appearance in one place – is conceived as an active, dynamic encounter of humans, animals, plants, natural forces and elements. The parts of the world influence each other and humans learn by acting in and with the environment. Gabriella Giannachi and Nigel Stewart [15] describe the active relation between nature and culture as: "*nature is always performed* and can only be *appropriated* by means of performance." The vision of a world full of active relations implies that in-situ music – and technology – is closely tied to a 'performance' and an

'instrument'. The integration of performance and instruments distinguishes in-situ music from sound art (or at least sound installations), as Laura Maes and Marc Leman note [16], based on a survey of a large number of works: "Sound artworks very rarely rely on performers." Performance is a multifaceted concept [17] but three dimensions are important to understand in-situ music and technology. On a basic level 'performance' presumes an action of a (human) *body*. Bodies are omnipresent in on-site music: the performer's body, the members of the audience (often walking among the performers when there is no central stage), people passing by, visible animals or imaginary, bodily appearances of nature (ghosts or spirits as in *Forest Singularity* of Trevor Wishart (1978) or *Human Windchimes* of Carolyn Chen (2017)). A second dimension of the concept 'performance' is its *productive character*: the performing bodies create a change noticeable for other bodies: they produce sound, walk, move objects, etc. A third dimension of 'performance' is *preparation and exercise*: a meaningful dialogue with a site requires preparation and exercise. The crucial link between performance and preparation appears repeatedly in the words and practices of various in-situ composers. "Preparation is everything" stresses Stephen Montague [18], when talking about his on-site performances such as *Apparitions* (2008) or realizations of John Cage's *Musicircus*. He states that a few days of practice just before the concert are not enough and adds that he needs to explore the performance site several weeks or months in advance. Building upon the work and experience of Pauline Oliveros, composer Marc Jensen [19] describes his composition *Tendency Mapping* (2008) as both a performance piece and an individual meditative discipline. Similar to Oliveros' practice, the preparation of a temporary performance in dialogue with the surroundings – other participants included – has turned into an ongoing learning process of listening and sounding, almost independent from the public performance. Within this view of performance as an intense, prepared encounter between human bodies and the environment, technology is to be understood as a (music) *instrument*. An instrument fits a human body and relates to a history or existing repertoire of actions which can be further enlarged or renewed by exercise and practice. This repertoire can be linked to musical performance (for example, in the case of a synthesizer) or daily tools (a radio or a hammer also has a history of actions). Repertoires, exercises and preparations not only serve to perform a score or plan of a meeting with the direct environment. They also provide a ground to deal with the indeterminate and unexpected elements of a living site (such as children playing, a strong wind, etc.) which can influence an on-site performance. Compare this to a cyclist, who has an experiential repertoire of actions and reactions, not only to reach a destiny within a desired time frame, but also to handle unexpected problems and maneuvers along the path to the destination.

At this point the contextual understanding of in-situ technology can be further refined: it is part of an active, prepared performance aimed at creating a meeting with the living site, and using instruments, which fit the human body. Every performance site is different and contains new 'unexpected' features, therefore realizing an on-site performance means adapting the balance of ingredients (score, performers, time of concert, location and organization of audience, etc.) to the features of a site. Finding a balance is more feasible if the applied technology is flexible and adaptable. Therefore many in-situ works – specifically the ones with a 'human', 'natural' or 'relational' vision on the site – have an open technology: they broadly define the required technological tools, offer a list of alternatives or demand 'lowtech' devices which already have a repertoire of actions to rely on. *Street Music* (1968) of Frederic Rzewski for example, just mentions "portable sound sources (voice, objects, instruments, and

battery-powered electronic devices).” In *Vespers* (1969) of Alvin Lucier, performers listen to the echoes of short clicks to position themselves in a dark space. Lucier prescribes a specific device (“Sondols”) to produce clicks but further on in the score, he mentions a list of alternatives, such as tongue-clicks or 10kHz pure tones. Examples of lowtech devices in in-situ music are megaphones (in the Megaphone Ensemble [20] or Stephen Chase's *Out-of-Doors Suite* (2011 – now)), simple playback or recording devices (in David Dunn's *Oracles* (1974-75) and *Place* (1975)) or bicycles (Godfried-Willem Raes' *Singing Bicycle Symphony* (1980), Mauricio Kagel's *Eine Brise* (1996)).

3. RECENT COMPOSITIONS

In the following part I show how in my own compositions in-situ technology realizes new dialogues and encounters between a site, the performers and the audience. I also focus on the integration of the sound-producing instrument, supporting tools and performance site into one overarching 'distributed instrument' [21]. Such a constellation of performers, technology and place often requires a specific practice and performance mode.

Synchronizing musical and non-musical activities to reveal a site's characteristics

When an ensemble of musicians plays together they usually see or hear each other. Synchronization of the performance happens through the music, body gestures, an external conductor or devices such as click tracks, chronometers, etc. Outside the concert hall, in places such as a house, park side or a lake, performers often hardly see and hear each other because of large distances or walls and trees obstructing the view. In-situ composers have designed creative synchronization and coordination solutions, from fireworks in Trevor Wishart's *Landscape* (1970), soundtracks transmitted by radio stations to the streets of Manila in José Maceda's *Ugnayan* (1974) to conductors in boats with colored flags in R. Murray Schafer's *Music for Wilderness Lake* (1979). Obtaining a collective timing not only happens because a common time frame is necessary to compose and structure music and sounds. I believe that the act of synchronizing also reveals intriguing characteristics of a site and its inhabitants. Lots of places display social and biological rhythms of humans, animals and objects. Street traffic rises and falls in the course of a day. Wind and rain set materials and objects in motion and make them sound together. Some of these social and biological rhythms are not very strict and occur in waves or clouds with lots of variation in the microtiming. The act of synchronizing – or the attempt to do so – reveals both the unity and resistance to act together. Some individual objects or beings are unable or do not want to synchronize in a strict or common rhythm.

In *Rolling Band* (2018) each performer has a trolley or roller suitcase and listens through one earphone to a common click track, sent by a (portable) wireless sender. The performers try to roll over the street stones in sync with the beat of the click track by adapting their walking and rolling speed. The size, patterns and material of the different street stones generate and distort rhythmic patterns. A 'city canyon' street may have very regular, symmetrical pavements and a lot of reverb, another one lots of holes and 'repair patches' with asphalt. The end result of *Rolling Band* is a spacious soundtrack of passing-by soundscapes and trolleys moving over stones, as a gentle, mechanical old train, with layers of regular and irregular rhythmic sounds. The instrument extends into a distributed instrument of trolley, street stones, the walking human body and the headphone (receiving the soundtrack). This soundtrack contains the

'score': in sections of 15 to 90 seconds the (simple) rhythmic patterns change tempo or accentuation, the performers try to play on the beat of this track. Practicing without one of these parts of the distributed instrument doesn't make any sense. Moreover, the body of the performers makes a perfect synchronization very difficult. The performers need to harmonize the size of their (walking) steps and the size of the street stones to adapt the sound of the trolleys to the beat. In the end, this audiovisual performance reveals how moving human bodies, streets and (rolling) instruments fail and succeed in working and playing together.

Hearizon (2016) displays another effect of synchronization: it makes large distances audible. In this composition three or more performers walk away from the central audience. As each moves in a different direction and gradually becomes less visible and audible, they end up playing at large distances (100 meters or more) from each other and the audience. At these large distances they can still play together, thanks to a wireless system or a portable playback device with a common soundtrack (started together). The performers play together in 'absolute' time through the wireless, which sends audio faster than the sound waves in the 'real world' air. Although separated by hundreds of meters they play with each other as a usual chamber ensemble, but the central audience only hears the music acoustically (and very softly) and experiences how the delays, filtering and other transformations of the performed music are made by the landscape and distance. Synchronization reveals how a landscape absorbs a musical ensemble, as each performer walks towards the sound horizon.

New coalitions of private and public (sound) spaces

The experience of watching the surroundings while not hearing them (but hearing other music or sounds), is usually associated with an individual or private 'inside' experience. Listening to headphones in a bus station or looking outside of the windows of a bar (while hearing inside radio music) are examples. Historically, the constellation of private and public spaces changes continuously, just as the balance between what people want to expose and hide from each other. Thanks to mobile and portable technologies such as laptop, internet or headphones people nowadays work, study or play computer games at many different places, including public ones. They are engaged in their own activities but remain somehow part of the surrounding, living environment. As a composer it is an intriguing challenge to find new coalitions of private and public spaces. *Not necessarily music* (2018) is a work for 'silent' musicians in a public space (a park, station, library, etc). The performers – with headphones – are playing digital instruments without public amplification through speakers. In a small number of sections of the composition they play privately: nobody but themselves hear what they are playing. In the other sections, they are not detached from the environment or their co-performer. In these sections there are four possible sensorial 'inputs' to improvise on: the sight or sound of the environment (the last one picked up by microphones) and the performed music or gestures of the other performer (the last one simply by observing the co-performer). A laptop with a Pure Data patch functions as a matrix connecting the inputs to three stereo outputs, the latter consisting of a headphone for each performer and the audience headphones (a one-to-all, multicast wireless system, or an internet connection with low latency).
The performance is acoustically very soft, people can ignore it, it doesn't disturb the site. The first performance took place in the reading room of a library where many people are reading the newspapers or watching their computer. People can also watch the performance (gestures) and listen to the acoustic environment. Or they can take one of the audience headphones and hear different sounds and music (from the Pure Data patch), but still related to the physical

environment or the visible performance gestures.

The main challenge for the two performers is not only to respond to the different sensorial inputs. Although they remain in the same place, they have to switch between 'mental spaces': they may be in a private space, just playing for themselves; they may be part of a group space and interact with the other performer or they may be part of the environment (for example, when they react to the surrounding sound coming from the microphones). Again, an overarching instrument emerges in which the instrument becomes more than the user interface (the keyboard, wind controller, etc.). The technology (microphones, audio processing in the computer patch, headphones) and composition plan connect the individual instruments, sounds of the performers and surroundings with each other.

Glass – specifically insulated glass – and its disconnection between sight and sound, has been heavily discussed. R. Murray Schafer called it a sound barrier to protect people's houses from outdoor noise pollution [22]. But I recognize a potential in glass and windows to extend the public space beyond 'private' walls and buildings. In *Glass* (2018, working title) the audience is seated indoors, in a space with large windows, as an office or bar. In the upcoming first performance the audience will be looking at a landscape with a street, a sports ground and trees in silence. When the doors are opened they can hear the outside sounds acoustically. Two performers with microphones are walking outside. Using omnidirectional, directional and close microphone techniques they bring (selections of) outside environmental sounds to the PA speakers in the audience space. Two other musicians are playing percussion and synthesizer, both inside and outside the audience space. Sometimes they are audible acoustically, sometimes amplified through the PA speakers, when the microphone performers pick up their sound. The combination of transparent, sound-isolating windows, (wireless) microphone recording techniques and the mobility of the performers enables me to turn a private experience into a shared, collective one. Moreover, the audience can not only hear and see the inside and outside landscape, they also see the montage process and experience how a 'landscape' is constructed.

Remote instruments: disconnect to connect

Displacement of sound or a disconnection between the user interface and the performer's body on the one hand and the sound production (usually the speaker) on the other, is a common feature of electronic and digital music instruments. In two compositions, *Here and There* (2017-18) and *Faraway* (working title), I use 'remote instruments': these are instruments in which the sound production happens in the environment, at a large distance from the performer's body. For example, a performer is sitting in a garden, he plays a keyboard sampler but the speakers are inside the house, sounding softly through the windows on the second floor; or he plays electric guitar but the speakers are in a garage 30 meters removed from the garden. The disconnection and distance between user interface and sound production enhances a special feeling when it is situated in a living environment: a loss of 'ego' and a feeling of connection with the surroundings, as if the sounding body of the performer is merged with the larger body of the surroundings. Although the remote instrument and its effects were discovered through individual on-site improvisations, it can be considered a further extension of the collective-consciousness-effect which was already expressed by *Musica Elettronica Viva* at the end of the 1960s. They greatly amplified contact microphones or synthesizers through a common setup of widely dispersed speakers. Frederic Rzewski [23] writes: "The performer identifies on the one hand with his own body, on the other with the

amplified and transformed signal, which reaches him from another point in space: the loudspeaker membrane. He is confronted with the task of confronting his double self with the mass of sound generated by several persons. At times he perceives as his own the sound produced by another, at times he perceives his own sound as another's. He experiences the possible identification of himself with the atmosphere in vibration."

In *Here and There* I applied this disconnection to places outside the concert hall to connect a performer to the direct environment, and not to the other members of a performance group as *Musica Elettronica Viva* did. This composition simply asks to combine one such remote instrument with one usual, close instrument, sounding near or in the performer's body. It is mainly a performer's piece or exercise because this feeling is produced by playing and improvising the remote instrument. The text score is very open but to achieve the effect and a convincing performance the important choice of the location is left to the performer during the preparation: "Find a fascinating spot – stationary or moving – for yourself, the nearby and distant instrument." In many in-situ compositions the choice of the site is planned in advance and part of the composer's job. In *Here and There* an extra involvement of the performer is required: the dedication to actively search and explore a site for places which "speak to you" and where the sound producing part of the remote instrument can be placed.

4. CONCLUSION

A performance site and its living presences have shared that place before the artistic intervention took place and will continue to do so afterwards. In-situ composition accepts the given 'liveness' of a site, it does not create an autonomous, artificial sound world but tries to stage an encounter between the participating people (performers, audience) and the given surroundings. The combination of music instruments, technologies and affordances of a site into an overarching, performative tool which can be mastered by human performers, ensures that again and again new features of the site and new ways of experiencing it are discovered. Technology is not an autonomous force in on-site composition, advancing towards a faster, more lively and realistic sound production. It is confined by place and time and operates within a distributed instrument to meet the real, physical world.

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[10] I consider a 'concert hall' as a monofunctional space, like a laboratory or conference room, isolated from its surroundings (the outside world is invisible and inaudible). The main function is accommodating musicians and organizers to design a music concert *according to their wishes*. Consequently, the content of a concert hall is empty and erasable: concerts are replaced by new concerts and previous performances leave no traces or history. Moreover, the concert hall is a black box, with an ideal, uniform acoustics: at every spot the music should be perfectly audible. Mike Pearson [9] has also made an extensive comparison of the theater auditorium and a site.

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