

PLAYFUL LOCATIVE ENSEMBLES IN THE URBAN SOUNDSCAPE

BY MICHAEL STRAEUBIG AND SEBASTIAN QUACK

ZUSAMMENFASSUNG

In diesem Beitrag stellen wir das Konzept des Spielerischen Ortsbasierten Ensembles (Playful Locative Ensemble) vor. Dazu geben wir drei Beispiele und unterscheiden diese Form des Ensembles von anderen ortsbasierten Klangprojekten im öffentlichen Raum. Wir diskutieren die Organisation der Spielerrollen, die Beziehung zur städtischen Umgebung und die spielerischen Aspekte des Konzepts.

ABSTRACT

In this paper, we introduce the concept of the Playful Locative Ensemble, present three recent projects as examples, and distinguish its form from other sound-focused projects in public space. We also discuss the organization of player roles within the ensemble, the relation to the urban environment, and the aspect of playfulness.

1. INTRODUCTION

Since the introduction of the Walkman in the 1980s, more and more people move through cities while listening to music or audiobooks. This practice has created millions of private auditory spaces embedded in a multi-sensorial public space. Despite technological efforts to keep out the latter, both constituents, the intentionally selected soundtrack and the environmentally created soundscape,¹ blend, producing what Thibaud calls »interphonic knots.«²

Intersections of location, environment, and sound pose aesthetic challenges³ and offer creative spaces for artistic experimentation at the same time. Prominent examples are audio walks, where the audience moves to a soundtrack⁴ along a

1 Schafer: *The Tuning of the World*; Wrightson: *An Introduction to Acoustic Ecology*.

2 Thibaud: *The Sonic Composition of the City*.

3 Truax: »Sound, Listening and Place.«

4 This distinguishes audio walks from soundwalks, a creative form explored by R. Murray Schafer (*The Tuning of the World*) and defined as »any excursion whose main purpose is listening to the environment« (Westerkamp: »Soundwalking,« 49). In terms of our initial distinction, soundwalks and the related practice of field recording focus on the soundscape and do not include a soundtrack.

pre-determined path or within certain geographical boundaries.⁵ Elements of the soundtrack are either played back automatically, activated manually by a performer,⁶ or triggered at specific locations, e.g. by GPS signals.⁷ Some of these projects focus on narration,⁸ while others question the relationship of public/private space⁹ or add a layer of interaction between the participants.¹⁰ Some location based games use audio as their primary interface.¹¹ Other artistic projects place audio sources such as loudspeakers,¹² orchestras,¹³ hot air balloons,¹⁴ a siren,¹⁵ or ship horns¹⁶ into the environment. A number of these works transform energy from the surroundings into sound¹⁷ or sonify movement¹⁸ or environmental data.¹⁹ These projects can be described as pervasive and might cause irritation for an unsuspecting general public.²⁰ Yet the intended audience is usually aware of the artwork, and the traditional distribution of roles between artist and audience is preserved. A significant body of artistic research and practice has answered the rapid development of mobile devices and the exponential growth of their usage: Through mobile music²¹ and mobile orchestras,²² various technological and social aspects of networked music, mobile sonic performances, and sound art have been explored.²³ An example from the context of academic research is the *GangKlang*

-
- 5 *Forest Walk*, Janet Cardiff, 1991. Janet Cardiff coined the term »audio walk« and later expanded the concept to »video walks.«
 - 6 *Remote X*, Rimini Protokoll (Stefan Kaegi/Jörg Karrenbauer), 2013.
 - 7 *Trace*, Teri Rueb, 1999; *Radio Aporee ::: Miniatures for Mobiles*, Udo Noll, 2011.
 - 8 *Wasser*, Stefan Schemat, 2004; *Craving, a Spatial Audio Narrative*, Bernhard Garnicnig/Gottfried Haider, 2007; *The Walk, Six to Start and Naomi Alderman*, 2013; *High: Views from Above*.
 - 9 *Radio Ballet Leipzig*, Ligna, 2003.
 - 10 *Wondermart*, Silvia Mercuriali/Matt Rudkin/Tommaso Perego, 2009.
 - 11 Ekman et al.: »Designing Sound for a Pervasive Mobile Game.«
 - 12 *Memoryloops*, Michaela Melián, 2008.
 - 13 *Musical Flashmob*, Copenhagen Phil, 2011.
 - 14 *Sky Orchestra*, Luke Jerram, 2003.
 - 15 *Hearing Sirens*, Cathy van Eck, 2005. The term siren is used in a double meaning in this artwork – the siren of the Greek mythology as well as the alarm device.
 - 16 *Stockholm Harbour Symphony, Interactive Agents* (Robin McGinley), 2011.
 - 17 *Audible Forces*, Mark Anderson/Mike Blow/Jony Easterby/Max Eastley/Dan Fox/Kathy Hinde/Nathaniel Mann/Peter Petravicius/Ed Holroyd, 2012.
 - 18 *Hlemmur in C*, Pall Thayer, 2004.
 - 19 *The Singing Trees of Tremough*, Stanza, 2013.
 - 20 Montola et al.: *Ethics of Pervasive Gaming*.
 - 21 Behrendt: *Handymusik*; Kirisits et al.: *Creative Interactions*.
 - 22 Wang/Essl/Penttinen: »Do Mobile Phones Dream of Electric Orchestras?«
 - 23 Gopinath/Stanyek: *The Oxford Handbook of Mobile Music Studies*.

project,²⁴ which seeks a deeper understanding of flow²⁵ by applying sonic interaction design to enable flow experiences while walking.

In order to achieve some orientation within this vast field, we have introduced the initial distinction between soundtrack and soundscape. There are many other possible distinctions to choose from, like the one between »the music one listens to [and] the music one plays,«²⁶ between aesthetics and environment,²⁷ music and noise, intentionality and contingency, improvisation and determinism, perception and generation,²⁸ location and movement, and between space and place.²⁹ In what follows, we restrict our discussion to a particular kind of mobile, locative sound making: The Playful Locative Ensemble.

2. THE PLAYFUL LOCATIVE ENSEMBLE

The term »ensemble« is commonly used in two different ways. The first one denotes a group of performers, musicians, or actors (the ensemble of a symphony orchestra). The second one describes a spatial relationship or arrangement of items (an ensemble of rocks in Yosemite Park).³⁰ We will use both meanings: An ensemble in the first sense is a group of players³¹ who create a common soundscape by moving in an urban environment. These ensembles are playful; they exhibit what Katie Salen and Eric Zimmerman call »free movement within a more rigid structure.«³² The more rigid frame in which they operate is twofold. On the one hand, there is, to different degrees, the musical structure prepared by the composition. This structure is also locative,³³ which relates to the ensemble in the

24 Hajinejad et al.: »GangKlang: Designing Walking Experiences.«

25 Csikszentmihalyi: *Flow*.

26 Barthes: »Musica Practica.«

27 Truax: »Sound, Listening and Place.«

28 For instance, when someone raises the volume of his or her music player in the subway and thereby inevitably becomes a musician for the others.

29 Cornelio/Ardévol: *Practices of Place-Making through Locative Media Artworks*.

30 In a metaphorical sense used by Monterde/Postill: »Mobile Ensembles,« based on the notion of »media ensembles« in Bausinger: »Media, Technology and Daily Life.« In neuroscientific terms, a neural ensemble is a group of functionally related neurons. Such an ensemble of 24 (simulated) neurons is the basis for the multi-site, networked musical artwork *The Fragmented Orchestra* by Jane Grant, John Matthias, and Nick Ryan. The idea of distances, proximities, and neural fields is further discussed in Grant et al.: »Sound Navigations.«

31 We use the terms »player« and audience interchangeably to denote the interactive nature of the role and to distinguish it from the role of the professional musician.

32 Salen/Zimmerman: *Rules of Play*, 304.

33 We use the term »locative« to denote projects that derive their meaning primarily from the location of the participants. This includes site-specific artworks as well as augmented reality and locative media using positioning technologies like GPS. Hemment (»Locative Arts«) classifies locative media and locative art into three modes: mapping, geo-

second sense. This is the architectural structure, the cityscape, in which the first, more ephemeral ensemble is moving. In other words, both the musical space and the physical space constitute media in which the form of the artwork appears.³⁴

One of the earliest works representing the idea of the Playful Locative Ensemble was Ian Mott's *Sound Mapping: An Assertion of Place*. In this performance, the participants walked with four sound-generating suitcases that were equipped with GPS and motion sensors.³⁵ The composition is site-specific and anchored in geographical space, but not in time. The intention of the project was »to assert a sense of place, physicality and engagement to reaffirm the relationship between art and the everyday activities of life.«³⁶ Placemaking can also be vehicular: During a period of ten years, the Bicrophonic Research Institute (BRI) created and refined the *Sonic Bike*,³⁷ a platform for participatory sound-based projects for cyclists. The *Sonic Bike* has been deployed in a multitude of projects as an »outdoor listening experience for all, the antithesis of headphones.«³⁸ Furthermore, collaborative locative music making with smartphones has been explored in a number of projects, for example *Sonic City*,³⁹ *Malleable Mobile Music*,⁴⁰ and *Net_Dérive*.⁴¹

In the following sections of the article, we describe three recent projects that exemplify the Playful Locative Ensemble.⁴² In each of these projects, the participants create sound by moving in the urban environment. Yet they differ in the way the audience is framed and in the types of interactions with which the players are offered to engage during the shared experience. The projects are *A Folded Path* by Circumstance, *Phantom Synchron* by Sebastian Quack et al., and *Kling-KlangKlong* by Michael Straeubig.

3. A FOLDED PATH

Circumstance describe their participatory musical performance *A Folded Path* (fig. 1) as a »pedestrian speaker symphony.«⁴³ The work has been presented at a vari-

annotation, and ambulant. The projects we discuss here are based on walking and would fit the ambulant category.

34 Luhmann: *Die Kunst der Gesellschaft*, 165–214.

35 *Sound Mapping: An Assertion of Place*, Ian Mott, 1998.

36 Mott/Sosnin: *Sound Mapping, an Assertion of Place*.

37 *Sonic Bike*, Bicrophonic Research Institute (Matthews/Griffiths), 2005.

38 Matthews/Griffiths: »Bicrophonic Research Institute.«

39 Gaye/Mazé/Holmquist: »Sonic City.«

40 Tanaka: »Malleable Mobile Music.«

41 Tanaka/Gemeinboeck: »Net_Dérive.«

42 Both authors of this paper have been directly involved in each of the three projects, either as (co-)creators or as part of the audience. In addition, Michael Straeubig conducted a one-hour interview with Duncan Speakman of Circumstance on November 20, 2015.

43 *A Folded Path*, Circumstance (Sarah Anderson/Duncan Speakman/Emilie Grenier), 2013.

ety of festivals, including Visualise (Cambridge), Kontraste (Krems), Natural Circuits (London), Auricle (Christchurch), ScreenCity (Stavanger), Playable City (Bristol), and Microwave (Hong Kong). For each of the locations, a site-specific variant was created.

In *A Folded Path*, approximately 30 participants are equipped with portable, location-aware loudspeakers that use GPS for positioning. The audience is then separated into three sub-ensembles. Each group is led by a »conductor,« who is tasked with controlling the temporal aspect of the symphony.



Figure 1. *A Folded Path*. Credits: *Circumstance*. Used with permission.

While the ensembles are following their conductors along pre-planned paths through the city, music is emanating from the speakers. This music can be described as a multi-channel phase composition that combines ambient, minimal, and classical elements.⁴⁴ The soundscape is widely audible in the city, which may result in various reactions from the public, ranging from enthusiasm to anger.⁴⁵

During the performance, which lasts approximately one hour, the groups move along at varying speeds, converge at certain locations, and diverge again. These intermediate encounters let the players experience the other groups' arrival and departure. Technically, they also serve as hold points to re-synchronize the ensembles.

A Folded Path puts its audience in the role of urban instrumentalists: They perform music by moving through space, while the routes, the multi-channel composition, and its timing have been meticulously prepared by the artists. While music »traditionally structures events in time rather than space to form what is a linear narrative,«⁴⁶ in *A Folded Path*, the parts of the composition are linked to sections of the routes, triggered by information from the GPS receivers. To unfold the symphony, the role of the conductor consists in steering the instrumentalists through space at certain speeds.

Still, contingencies in the environment may manifest themselves and interfere with precise timings. A group might have to wait longer than expected before crossing a street, or a pre-planned route might be blocked by a construction site that popped up overnight. Moreover, the spatial coherence of the ensembles is changing frequently during a walk. The challenge for the conductors is to accomplish a flexible way of synchronization between timing and location, in the words of Duncan Speakman, to keep the ensembles on an »elastic band.«

4. PHANTOM SYNCHRON – SOUNDTRACK WEIMAR

Developed for the »Kunstoff Weimar« art festival, *Phantom Synchron* (fig. 2) consists of a series of six participatory musical performances.⁴⁷ The site-specific project was performed over a 24-hour period on the 4th and 5th September 2015 in various locations in the German city of Weimar.

44 A specially prepared stereo version of the soundtrack of *A Folded Path* is available at <http://wearecircumstance.com/exchange>.

45 A particular example of a problematic encounter was witnessed during a performance in Bristol, where a group of fishermen were visibly aggravated by the sound. Other members of the public observed during that event reacted puzzled, curious, amused, or delighted.

46 Mott/Sosnin: *Sound Mapping, an Assertion of Place*.

47 *Phantom Synchron – Soundtrack Weimar*, Daniel Ott/Sebastian Quack/ Kirsten Reese/Enrico Stolzenburg, 2015.



Figure 2. *Phantom Synchron – Soundtrack Weimar*. Credits: Merlin Nadj-Torma for Kunstfest Weimar / via nova e.V. Used with permission.

Starting from a central meeting point, an audience of 10-40 people is equipped with »sound boxes« consisting of a built-in MP3-player and loudspeakers. At the beginning of each performance, the production team synchronizes the MP3-players, with each device playing back one voice in a multichannel acoustic composition.

The audience then follows a large, mobile digital clock to one of six sites: a stadium, a parking garage, a decommissioned jail, a park landscape, a castle courtyard, and the central city square. During the walk, sounds are played from the speakers, alternating atmospheric sound loops with instructions and exercises on how to use the sound boxes, how to hold them, how to move, and what to listen for.

Upon arrival at the respective site, each player is shown an individual graphical score, assigning him or her specific positions within the site at certain times and depicting ways to hold the sound box. Between these precisely defined actions, the audience is invited to explore the site and experiment with the sound boxes. Referencing the world of cinema, this collective activity is framed as creating a live »soundtrack« that adds a special layer to the action at a specific location.

The audience members act as instrumentalists joining an ensemble that includes 12 professional musicians and a large number of community performers (hobbyists, such as athletes, skaters, RC car enthusiasts). This large ensemble collaboratively performs a complex musical soundscape that evolves in time and

across a spatial structure for over 90 minutes, radically changing the atmosphere of the location and reinterpreting the space acoustically.

At times, all speakers emit the same sound; at other times, each speaker plays individually. Sometimes the sounds reproduce and relocate acoustic events taking place in the physical space; sometimes they introduce completely new elements that only exist in the imagination. The soundscape alternates between different qualities, including contemporary and historical music, abstract noise, and identifiable sounds, such as a helicopter, fire, chatter, footsteps, etc.

The fact that the audience has no influence over the fixed soundtracks emitting from the boxes allows for an alternation of precisely timed group events and phases of individually placed spatial events. The exact timekeeping for the musicians and community performers is achieved through radio-controlled watches, while the players receive their timings from the large digital display. The result is a series of carefully crafted landscape compositions that are performed and simultaneously playfully explored by the participants.

5. KLINGKLANGKLONG

KlingKlangKlong (fig. 3) is a location-based multiplayer experience informed by the concept of a »playful system.«⁴⁸ The project is currently being developed by Michael Straeubig as part of his PhD thesis.⁴⁹ Prototypes of *KlingKlangKlong* and of a variant called *neurotic* were demonstrated at Playpublik festival in Krakow in September 2014, Plymouth Book Festival in October 2014, Prototype Dublin in October 2014, playin'siegen in April 2015, and MediaCity Plymouth in May 2015.

KlingKlangKlong is played with smartphones that translate the players' locations into sound. This is achieved in a straightforward manner: By moving through the physical space, the players simultaneously move on the surface of a virtual sequencer. One dimension (usually the latitude of the player) corresponds to pitch, the other dimension (longitude) is mapped to the time-position on the sequencer. The interface allows a manual switch to other audio parameters, although this feature is experimental. Each device receives the location and state changes of the currently active players almost instantly. The devices are connected by a central server, which also sets the boundaries of the playing field and manages the virtual players.

KlingKlangKlong serves as an experimental arrangement to explore the idea of playful (social) systems, a construction where human and virtual subsystems play with each other. In addition to the human participants, it therefore deploys a number of virtual players (»Virtuals«). Humans and Virtuals meet each other in

48 *KlingKlangKlong*, Michael Straeubig, 2014.

49 Straeubig: »Designing Playful Systems in Mixed Reality,« CogNovo. Available at: <http://www.cognovo.eu/project-9>, 11/26/2015.



Figure 3. *KlingKlangKlong*. Credits: Martin Christopher Welker for Playpublik. License: Creative Commons (CC BY-NC 2.0).

mixed reality, a concept that was realized in early locative games.⁵⁰ The commonly created soundtrack is the primary medium of communication between the players. Musical structures may temporarily arise through synchronized movements or be destroyed by any player's intervention.

There are no rules, no inherent goals, and, in principle, no beginning or end in *KlingKlangKlong*. In the context of mixed-reality games, this concept has been described as design for emergence: »to provide just enough of a game context and challenge for people to be creative, to extend and enrich the experience of play through their interaction in the real world.«⁵¹ The approach encourages meta-gaming and emergent gameplay that is created by the players,⁵² which suits the systems-theoretic design goals for *KlingKlangKlong*.

50 For example, in the location based game *Can You See Me Now?* by Blast Theory, a virtual avatar interacts with the players. This avatar is controlled by another human player. In contrast to this, virtual players in *KlingKlangKlong* are controlled by the computer.

51 Vogiazou et al.: »Design for Emergence.«

52 Schell: *The Art of Game Design*, 171-174. An example of emergent gameplay observed during playtesting came up when players started to chase other players, switching from collaborative sound making to free play behavior.

6. DISCUSSION

We have briefly described the three projects in order to discuss four questions that are relevant to the concept of Playful Locative Ensembles: 1) In which way are the three projects »locative«? 2) What constitutes the participatory »ensemble« in each case, and how are the player roles framed? 3) How does the movement of participants translate into a musical experience, and how does it interact with the urban soundscape? 4) Where does playfulness arise in the projects?

6.1 LOCATION-AWARENESS AND SITE-SPECIFICITY

Art projects that make use of urban environments and digital technology⁵³ can be analyzed in terms of location-awareness and site-specificity. These are distinct concepts that have evolved independently from each other in different fields. Location-awareness describes how a system makes use of location data, for example through GPS-enabled smartphones or other mobile devices. Site-specificity refers to experiences or aspects of a place that the artist takes into account when producing her work.

A Folded Path uses location-aware GPS technology built into the mobile speakers, which allows the composition to adapt to the players' locations in real-time. In terms of site-specificity, the work takes into account the architectural setup needed for groups moving along diverging and converging paths. For each new performance location, the routes are chosen and the musical material is rearranged to fit the spatial layout. We might say that *A Folded Path* is a site-adaptable composition, reacting to certain aspects of the location while remaining customizable to be performed elsewhere.

Phantom Synchron does not use location-aware technology. Instead, it relies on the participation of the players to move the pre-produced soundtracks around. The time structure of the performance is fixed to the second – allowing for precise, site-specific interactions between the playing audience, the professional musicians, and the community performers.⁵⁴

Like *A Folded Path*, *KlingKlangKlong* uses location-aware technology to react to the players' movements. However, starting an instance of *KlingKlangKlong* only requires the definition of an area for playing. There is no preconceived relation to the environment. While the ensemble of the city restricts the possible space for sound generation, *KlingKlangKlong* is conceptually site-generic.

53 Buschauer/Willis: *Locative Media*; Silva/Sheller: *Mobility and Locative Media*; Wilken/Goggin: *Locative Media*.

54 An example: An audience member approaches the long jump facility in the stadium, where members of a local sports club take turns jumping. From the sound box, you can hear a coach shouting encouraging remarks to the jumpers, »hepp!«, »well done« ... while a percussion player accompanies the event rhythmically on a metal structure next to the jumping pit.

6.2 PLAYER ROLES AND THE ENSEMBLE

Both *A Folded Path* and *Phantom Synchron* provide the participants with opportunities to enact and play with pre-composed musical patterns in space. Yet they do not offer any way to determine or deliberately select what is emitted from the speakers. This allows for a strong measure of artistic planning and control over the soundscape created during each performance. At the same time, the players experience a mode of listening that is free, even meditative, which is characteristic of music involving random elements or environmental sounds outside the listener's control.

In contrast, *KlingKlangKlong* invites players individually to appropriate the city as a shared platform for a distributed composition, consciously reacting to each other's musical choices in real time. *KlingKlangKlong* is thus closer to improvisational play modes⁵⁵ than *A Folded Path* and *Phantom Synchron*. This is especially highlighted by the introduction of computer controlled Virtuals in the *KlingKlangKlong* system. The interaction between human and non-human players is designed as communication between equally entitled systems, rather than as an interaction between a player and a pre-composed system, or a geo-spatial musical structure created by an artist.

A Folded Path and *Phantom Synchron* frame players as an ensemble of instrumentalists who re-create, discover, or interpret a pre-defined musical score created by composers. *KlingKlangKlong* frames players as an ensemble of improvising musicians or collaborative composers who create a new musical score through play.

6.3 INTERACTION WITH THE URBAN SOUNDSCAPE

All three projects invite participants to experience the relationship between sound and place and to navigate an urban soundscape through movement. In *A Folded Path*, player movement is primarily tied to manipulating time. The system uses the GPS coordinates of players to trigger musical events. By moving along a predefined path, the audience determines the timing of musical events. Moving from place to place actively advances the musical performance. In *Phantom Synchron*, player movement is primarily tied to manipulating place. Sounds will happen at a certain time – no matter what – but players are responsible for spatial interpretation. Their movement allows players to experience a sound placed in a certain way by the composers or to situate sounds in locations not determined by the composers. In *KlingKlangKlong*, player movement is primarily tied to manipulating a musical score. Players move through the city in order to write notes into a looping musical pattern. Moving from place to place rewrites the loop.

55 A musical performance that blends improvisation and real time signaling between musicians is *Creative Construction Set TM* by George Lewis, performed by Splitter Orchester, 2015.

6.4 PLAY AS FREEDOM WITHIN BOUNDARIES

Play permeates all three projects. We postulated above that the movement of ensembles of players within the ensemble of the cityscape constitutes play. Therefore, unlike professional orchestras, our ensembles perform autotelic acts of play. In their double role as performers and audience, they play for play's sake.

In *A Folded Path* and *Phantom Synchron*, players are invited to experiment with their instruments by holding the sound boxes in different directions, against objects or body parts, or by covering the speaker to reduce volume. They also explore space, moving around with the sound boxes in relation to other players while the environment affects the collective soundscape.

Phantom Synchron features an additional element of abstract puzzle solving when players try to decipher their individual score in order to be precisely at the right place at the right time. In addition, it provides space for expressive performances to take place, such as mimicking the imagined source of the sound (for example, pretending to be a graffiti artist when spray-painting noises come from the box). This sometimes leads to spontaneous player-to-player interactions. Such interactions also occur in *KlingKlangKlong*, for example, when players decide to give up the idea of generating music and start chasing each other through the city instead.

7. SUMMARY

If the Walkman »functions like a technological device which introduces the senses within the urban territory,«⁵⁶ we can ask what it is that introduces the actuators, entities that actively create, express themselves, and perform in the public space. Our answer is that this role can be achieved by Playful Locative Ensembles through their specific relationships among composers, performers, listeners, and the environment.

We have discussed three recent projects that exemplify the notion of Playful Locative Ensembles, with both overlapping and diverging approaches, production processes, and player experiences. Out of the multitude of relations between these projects, we have focused on four central aspects: location-awareness and site-specificity, player roles and framing of the ensemble, player interaction with the soundscape through movement, and play as free movement within more rigid boundaries.

While there are many questions to explore, both on the artistic side⁵⁷ as well as on the level of analytical language, we can observe that a common form of the

56 Thibaud: *The Sonic Composition of the City*.

57 An aspect that is notably absent in the present paper is an in-depth discussion of the musical dimension of the three projects. After some initial discussions, we decided to focus on the non-musical attributes that characterize the Playful Locative Ensemble. A comparative musical analysis could be undertaken in a future study.

Playful Locative Ensemble in the urban soundscape is taking shape, differentiating itself from general locative artworks while combining diverse influences ranging from locative game and interaction design, participatory and site-specific performance art, to contemporary musical composition and sound installations and even architecture and urban design.

This emerging form provides creators and participants with experiential qualities that other types of sound-based works rarely tap into: the satisfaction of reconnecting the environment of the city with the joys of collective music making, the excitement of moving music out of dedicated and often commercialized spaces into the contested and unpredictable realm of the commons, the pleasure of playing a creative role in a movement and forming a diverse ensemble, and the direct emotional impact that only music can achieve.

ACKNOWLEDGEMENTS

Michael Straeubig's work is funded as part of Marie Curie Initial Training Network FP7-PEOPLE–2013-ITN, CogNovo, grant number 604764. We wish to extend special thanks to Duncan Speakman (Circumstance), Judith Ackermann, and the team of playin'siegen.

REFERENCES

- Barthes, Roland. »Musica Practica.« *Image, Music, Text*. London: Fontana Press, 1987. 149-154.
- Behrendt, Frauke. *Handymusik: Klangkunst und ›mobile devices‹*. Osnabrück: epOs-Music, 2004.
- Bausinger, Hermann: »Media, Technology and Daily Life.« *Media, Culture & Society* 6.4 (1984). 343-351.
- Buschauer, Regine, and Katharine Willis, eds. *Locative Media: Multidisciplinary Perspectives on Media and Locality*. Bielefeld: transcript, 2013.
- Cornelio, Gemma San, and Elisenda Ardévol. »Practices of Place-Making Through Locative Media Artworks.« *Communications* 36.3 (2011). 313-333.
- Csikszentmihalyi, Mihaly. *Flow: The Psychology of Optimal Experience*. New York: Harper, 1991.
- Ekman, Inger et al. »Designing Sound for a Pervasive Mobile Game.« *ACE '05 Proceedings of the 2005 ACM SIGCHI International Conference on Advances in Computer Entertainment Technology*, ACM, 2005.
- Farman, Jason. *The Mobile Story: Narrative Practices with Locative Technologies*. New York: Routledge, 2014.

- Gaye, Lylya, Ramia Mazé, and Lars Erik Holmquist. »Sonic City: The Urban Environment as a Musical Interface.« *Proceedings of the 2003 Conference on New Interfaces for Musical Expression*. National University of Singapore, 2003. 109-115.
- Gopinath, Sumanth S., and Jason Stanyek, eds. *The Oxford Handbook of Mobile Music Studies*. New York: Oxford UP, 2014.
- Grant, Jane, John Matthias, and Matt Wade. »Sound Navigations: Distances, Proximities and Neural Fields.« *CR12: PRESENCE IN THE MINDFIELD: Art, Identity and the Technology of Transformation*. Lisbon: Portugal, 2011.
- Hajinejad, Nassrin, Heide-Rose Vatterrott, Barbara Grüter, and Simon Bogutzky. »GangKlang: Designing Walking Experiences.« *Proceedings of the 8th Audio Mostly: A Conference on Interaction with Sound, AM '13*. Piteå: Sweden, ACM, 2013.
- Hemment, Drew. »Locative Arts.« *Leonardo* 39.4 (2006). 348-355.
- Hight, Jeremy. »Views from Above: Locative Narrative and the Landscape.« *Leonardo Electronic Almanac* 14.7-8 (2006). 1-9.
- Kim-Boyle, David. »Network Musics – Play, Engagement and the Democratization of Performance.« *Proceedings of the International Conference on New Interfaces for Musical Expression*. Genoa, 2008. 3-8.
- Kirisits, Nicolaj et al. *Creative Interactions – The Mobile Music Workshops 2004-2008*. Vienna: Univ. für Angewandte Kunst Wien, 2008.
- Luhmann, Niklas. *Soziale Systeme: Grundriss einer allgemeinen Theorie*. Frankfurt/Main: Suhrkamp, 1984.
- Luhmann, Niklas. *Die Kunst der Gesellschaft*. Frankfurt/Main: Suhrkamp, 1997.
- Matthews, Kaffe, and Dave Griffiths. »Bicrophic Research Institute.« *sonicbikes.net*, n.d. 11/25/2015.
- Monterde, Arnau, and John Postill. »Mobile Ensembles: The Uses of Mobile Phones for Social Protest by Spain's Indignados.« *The Routledge Companion to Mobile Media*. Ed. Gerard Goggin and Larissa Hjorth. New York: Routledge, 2014.
- Montola, Markus, Annika Waern, Jussi Kuitinen, and Jaakko Stenros. *Ethics of Pervasive Gaming*. D5.5. Integrated Project on Pervasive Gaming, 2006.
- Mott, Iain, and Jim Sosnin. »Sound Mapping, an Assertion of Place.« *Proc. of Interface*, 2013. Web. 11/20/2015.
- Salen, Katie, and Eric Zimmerman. *Rules of Play: Game Design Fundamentals*. Cambridge: MIT, 2003.
- Schafer, Murray R. *The Tuning of the World*. New York: Knopf, 1977.
- Schell, Jesse. *The Art of Game Design: A Book of Lenses*. Boca Raton: CRC, 2015.
- Silva, Adriana de Souza e, and Mimi Sheller, eds. *Mobility and Locative Media: Mobile Communication in Hybrid Spaces*. New York: Routledge, 2015.

- Tanaka, Atau. »Malleable Mobile Music.« *Adjunct Proceedings of the 6th International Conference on Ubiquitous Computing (UBICOMP)*, 2004.
- Tanaka, Atau, and Petra Gemeinboeck. »Net_Dérive: Conceiving and Producing a Locative Media Artwork.« *Mobile Technologies: From Telecommunications to Media*. Ed. Gerard Goggin and Larissa Hjorth. London: Routledge, 2008. 174-186.
- Thibaud, Jean-Paul. »The Sonic Composition of the City.« *The Auditory Culture Reader*. Ed. Michael Bull and Les Back. Oxford: Berg, 2003. 329-342.
- Truax, Barry. »Sound, Listening and Place: The Aesthetic Dilemma.« *Organised Sound* 17.3 (2012). 193-201.
- Vogiazou, Yanna et al. »Design for Emergence: Experiments with a Mixed Reality Urban Playground Game.« *Personal and Ubiquitous Computing* 11.1 (2006). 45-58.
- Wang, Ge, Georg Essl, and Henri Penttinen. »Do Mobile Phones Dream of Electric Orchestras?« *Proceedings of the International Computer Music Conference*, 2008.
- Westerkamp, Hildegard. »Soundwalking.« *Autumn Leaves: Sound and the Environment in Artistic Practice*. Ed. Angus Carlyle. Paris, France: Association Double-Entendre in association with CRISAP, 2007. 49.
- Wilken, Rowan, and Gerard Goggin, eds. *Locative Media*. New York: Routledge, 2015.
- Wrightson, Kendall. »An Introduction to Acoustic Ecology.« *Soundscape: The Journal of Acoustic Ecology* 1.1 (2000). 10-13.

ARTWORKS

- A Folded Path, Circumstance*. Sarah Anderson/Duncan Speakman/ Emilie Grenier, 2013.
- Audible Forces*. Mark Anderson/Mike Blow/Jony Easterby/Max Eastley/Dan Fox/Kathy Hinde/Nathaniel Mann/Peter Petravicius/Ed Holroyd, 2012.
- Can You See Me Now?* Blast Theory, 2001.
- Craving, a Spatial Audio Narrative*. Bernhard Garnicnig/Gottfried Haider, 2007.
- Creative Construction Set TM*. George Lewis and Splitter Orchester, 2015.
- Forest Walk*. Janet Cardiff, 1991.
- Hearing Sirens*. Cathy van Eck, 2005.
- Hlemmur in C*. Pall Thayer, 2004.
- KlingKlangKlong*. Michael Straeubig, 2014.
- Memoryloops*. Michaela Melián, 2008.

MICHAEL STRAEUBIG/SEBASTIAN QUACK

- Musical Flashmob*. Copenhagen Phil, 2011.
- Oscillating Cities*. Christopher Wood, 2014.
- Phantom Synchron – Soundtrack Weimar*. Daniel Ott/Sebastian Quack/Kirsten Reese/Enrico Stolzenburg, 2015.
- Play Me, I'm Yours*. Luke Jerram, 2008.
- Radio Aporee ::: Miniatures for Mobiles*. Udo Noll, 2011.
- Radio Ballet Leipzig*. Ligna, 2003.
- Remote X, Rimini Protokoll*. Stefan Kaegi/Jörg Karrenbauer, 2013.
- Sky Orchestra*. Luke Jerram, 2003.
- Sound Mapping: An Assertion of Place*. Ian Mott, 1998.
- Stockholm Harbour Symphony, Interactive Agents*. Robin McGinley, 2011.
- The Fragmented Orchestra*. Jane Grant/John Matthias/Nick Ryan, 2008.
- The Singing Trees of Tremough*. Stanza, 2013.
- The Walk, Six to Start*. Naomi Alderman, 2013.
- Trace*. Teri Rueb, 1999.
- What Sound is Space?/Stadtklang Erlangen*. Mikromakrowelt, 2013.
- Wasser*. Stefan Schemat, 2004.
- Wondermart*. Silvia Mercuriali/Matt Rudkin/Tommaso Perego, 2009.