



Bundesministerium
für Bildung
und Forschung

HUMBOLDT-
UNIVERSITÄT
ZU BERLIN



International Conference

Interactive Digital Art & Societal Health

December 02–03, 2022

Venue: Kunsthaus KuLe, Auguststraße 10, 10117 Berlin

*Participation is free of charge, but due to limited seats, it requires registration beforehand (until the 1st of December), sending an email to: marcello.lussana@hu-berlin.de
Priority is given to participants who are able to attend the whole conference.*

Recently the research area “digital health” has been established and there has been a growing interest in the use of digital technologies for creative arts therapy, whose practice enriches people's lives, usually as part of a psychotherapy process. This conference asks what roles interactive digital art could play in societal health, including the needs of individuals, communities and populations.

While digitisation may lead to isolation, separation and addiction of individuals and groups into social bubbles, interactive digital art tends to integrate social interaction of two or more persons situated in a physical environment into a mixed, augmented and virtual reality.

More specifically, interactive digital art, i.e. art that allows real-time interaction of the performer or participant, is considered to enhance users'/clients' freedom of expression, especially in cases where they are constrained by the physical environment, and to facilitate multimodal expression, combining images, sounds and/or body movements.

The motivation of organizing this conference is to promote the usage of interactive digital art in healthcare and other daily life contexts where societal health plays a role both on a theoretical and practical level.

The conference addresses the following questions, among others:

- To what extent is social health promoted by interactive digital art? Which artistic media are particularly relevant?
- What are the benefits of interactive digital art as a means of creative arts therapy?
- What are methodological considerations concerning users'/clients' assessments?
- What are future research directions?

The whole conference will be video and audio recorded, later on they will be published on the internet for a broader audience.

In case you do not want to appear in such videos, please let us know.

Program

Friday, December 2, 2022

- 10:00-10:15 Registration
- 10:15-10:30 Jin Hyun Kim (Humboldt-Universität zu Berlin): **Opening address**
- 10:30-11:15 Marcello Lussana, Marta Rizzonelli, and Pascal Staudt (Humboldt-Universität zu Berlin): **Interactive music system Sentire as a tool to support social interaction**
- 11:15-11:30 Break
- 11:30-12:15 Lea Sittig (Humboldt-Universität zu Berlin) and Benjamin Stahl (Medical School Berlin): **Impact of childhood trauma on progress in couple therapy: A waiting-list controlled proof-of-concept trial;**
Dilan Kaya and Benjamin Stahl (Medical School Berlin): **Exploring the short- and long-term influence of couple therapy on mental health: A waiting-list controlled proof-of-concept trial**
- 12:15-13:00 Jin Hyun Kim and Marcello Lussana (Humboldt-Universität zu Berlin): **Sentire demonstration**
- 13:00-14:00 Lunch
- 14:00-14:45 Elena Partesotti (State University of Campinas): **E-mocomu at the Oltremusica workshop: An EDMi to promote Creative Empowerment and bodily expression.**
- 14:45-15:30 Andreas Bergsland (Norwegian University of Science and Technology): **Potential for health and well-being effects in interactive sonification of movements**
- 15:30-15:45 Break
- 15:45-16:30 Robert Wechsler (MotionComposer GmbH): **The MotionComposer: A movement-music device for persons of all abilities**
- 16:30-17:15 Robert Wechsler (MotionComposer GmbH) and Andreas Bergsland (Norwegian University of Science and Technology): **MotionComposer try it out!**
- 17:15-17:30 Break
- 17:30-18:15 Jin Hyun Kim (Humboldt-Universität zu Berlin): **A nonverbal first-person approach to artistic human-computer interaction**
- 18:15-19:00 Jin Hyun Kim and Marcello Lussana (Humboldt-Universität zu Berlin): **Moving, hearing, and feeling: A dancing micro-phenomenological interview in a musical sound environment**

Saturday, December 3, 2022

- 10:00-10:45 Claudia Núñez Pacheco (KTH Royal Institute of Technology): **From self to others: Soma design, wellbeing and homeness**
- 10:45-11:30 Jan Schacher (Sibelius Academy, University of the Arts Helsinki): **Transformative listening – Sonic interactions in lived social environments**
- 11:30-11:45 Break
- 11:45-13:00 **Roundtable** with Alberto de Campo (UdK Berlin), Maxime Le Calvé (Humboldt-Universität zu Berlin), Stefan Mainka (Parkinson Klinik Beelitz-Helinstätte), Jin Hyun Kim (Humboldt-Universität zu Berlin; Moderation) and Norman Sieroka (University of Bremen)

Interactive music system Sentire as a tool to support social interaction

Marcello Lussana, Marta Rizzonelli, and Pascal Staudt
Humboldt-Universität zu Berlin

Sentire is an interactive music system that measures distance and touch between two people and provides real-time sound feedback. Sentire includes a custom software and a capacitive sensing system which takes advantage of the human body's electric conductivity to detect proximity; the interactional inputs of the two users are then sonified through specific parameter mappings implemented in so called "sound environments". To optimize the effectiveness of Sentire's real-time sound feedback, we developed an automatic classification of interactive gestures. Our proof of concept uses the sensors' proximity data to train a deep learning model on the annotated interaction events. The data set consists of recorded proximity data from 40 sessions and annotations gathered from structured observation. With our proof of concept, we can predict interactive behaviors – in particular, arm movements – that intuitively affect the proximity signal. Among the reasons why real-time sound feedback seems an appropriate tool to support social interaction both in therapeutic and non-therapeutic contexts is the fact that it shares with somatic practices the potential of increasing proprioceptive awareness and kinaesthetic perception. In addition to this, both a vast theoretical background on the relationship between musical behaviors and sociality and our empirical findings based on the analysis of 20 interactive sessions support the hypothesis that Sentire can facilitate social and possibly prosocial behaviors, i.e. positive forms of sociality like helping or supporting attitudes. Our structured observations revealed that Sentire has a general facilitating effect on interactive behaviors (i.e. behaviors that are both matched and synchronous), which were mostly related by interpersonal causality (i.e. one interactant's action caused the other's). These findings indicate that most behaviors supported by Sentire are genuinely interpersonal social, rather than, e.g. elicited by the interaction with the environment or due to chance.

Impact of childhood trauma on progress in couple therapy: A waiting-list controlled proof-of-concept trial

Lea Sittig^{1,*}, Benjamin Stahl^{1,*}, Anne Milek², Florian-Hendrik Gehrman³, Marcello Lussana³, Marta Rizzonelli³, Pascal Staudt³, Jin Hyun Kim³

¹ Medical School Berlin

² Witten-Herdecke University

³ Humboldt-Universität zu Berlin

* Authors contributed equally.

Background. Known as a risk factor for physical and mental health, history of childhood trauma may affect well-being in romantic relationships in various ways, such as by diminishing the ability of secure attachment as a central prerequisite of long-term commitment. The present work seeks to explore the potential effect of childhood trauma on change in relationship satisfaction after intensive couple therapy.

Methods. Fifteen couples—overall 30 individuals—went through an initial waiting interval and subsequent treatment period. Each phase lasted 5 weeks. The intervention involved weekly 2-hour sessions of music-based integrative couple therapy. Testing included the Childhood Trauma Questionnaire (CTQ) at baseline and the Couples Satisfaction Index (CSI) before and immediately after the waiting interval and treatment period.

Results. An analysis of covariance revealed a significant interaction between CTQ scores at baseline and change in CSI performance ($p = 0.04$). Higher CTQ scores were associated with smaller benefit from couple therapy. Notably, degree of childhood trauma explained almost 27% of the variance associated with change in relationship satisfaction. As expected, no significant differences over time occurred during the waiting interval.

Discussion. The current findings provide some evidence that history of childhood trauma can substantially reduce progress in couple therapy.

Exploring the short- and long-term influence of couple therapy on mental health: A waiting-list controlled proof-of-concept trial

Dilan Kaya^{1,*}, Benjamin Stahl^{1,*}, Anne Milek², Florian-Hendrik Gehrman³, Marcello Lussana³, Marta Rizzonelli³, Pascal Staudt³, Jin Hyun Kim³

¹ Medical School Berlin

² Witten-Herdecke University

³ Humboldt-Universität zu Berlin

* Authors contributed equally.

Background. A growing body of research suggests that couple therapy increases relationship satisfaction. However, relatively little is known about the short- and long-term impact of couple therapy on mental health. To determine this impact, the present work focuses on change in psychopathology, including depression, following intensive couple therapy.

Methods. Fifteen couples—overall 30 individuals—went through an initial waiting interval and subsequent treatment period. Each phase lasted 5 weeks. The intervention involved weekly 2-hour sessions of music-based integrative couple therapy. Outcomes assessed general psychopathology (ICD-10 Symptom Rating, ISR) and depression severity (Beck's Depression Inventory, BDI) before (T_0) and immediately after the waiting interval (T_1) and treatment period (T_2) alongside a 12-month follow-up (T_3).

Results. Statistical analyses revealed significantly reduced ISR scores after the treatment period (T_2-T_1 [95%-CI]: -2.9 [\pm 2.4], $p = 0.028$), a small effect still noticeable at 12-month follow-up (T_3-T_2 : $M = 0.1$ [\pm 3.1]). In contrast, analyses showed no decrease in BDI scores after the treatment period (T_2-T_1 : $M = -0.9$ [\pm 2.0]), but significantly diminished symptom severity reflecting a moderate effect at 12-month follow-up (T_3-T_2 : $M = -3.4$ [\pm 2.1]; $p = 0.004$). No change occurred on any outcome during the waiting interval (T_1-T_0).

Discussion. Moving beyond relationship satisfaction, the current findings indicate that couple therapy may benefit various aspects of psychopathology. Although limited by the lack of an active control condition, these findings provide preliminary support for the long-term stability and delayed manifestation of improved mental health one year after the end of treatment.

E-mocomu at the Oltremusica workshop: an EDMI to promote Creative Empowerment and bodily expression

Elena Partesotti

State University of Campinas

About 20 years ago it was created the concept of Digital Musical Instrument, as part of New Interface for Musical Expression (NIME), and with this term, we now classify new types of musical instruments that differ from the traditional ones in form, material and ways of being played that we knew up to that moment. In this paper, we present a type of DMI: the Extended DMI (EDMI) e-mocomu (e-motion, colour and music) and describe it within the Oltremusica workshop, which took place in Italy in 2020.

DMIs have been applied mainly in the artistic area because of the diverse possibilities they offer, but at the same time, they can be implemented in the therapeutic and educational fields. Having catalogued new forms of musical instruments has not only represented the new era in which musical research has entered; but, more importantly, this new term also coined a new way the user as a spectator can experience art.

The user becomes both a performer and a visitor to the 'opera', while the musician no longer needs to know the music theory thoroughly and have practical experience: it will be easier for her to approach the musical field, to know, play with and also playing a digital instrument. During the workshop, e-mocomu was proposed to an association that works with people with disabilities. It emerges how, through the stimulation of the user's creativity, digital art can become a precious ally for self-expression and communication in clients with difficulties, but also a bridge to learning differently. Communication, in particular, is a pillar not only in Music Therapy, to foster psychological recovery, but also to promote social health within society.

Potential for health and well-being effects in interactive sonification of movements

Andreas Bergsland

Norwegian University of Science and Technology

This paper argues how interactive digital art combining aspects from dance and music through sensor and sound generation technologies has the potential of promoting the health and well-being of users of all abilities. Dance and music in a more traditional sense are known to have positive health effects by motivating movement, creative expression and social interaction. Moreover, they can reduce the risk of physical illness by improving aerobic capacity, balance, elasticity and coordination as well as mental disorders by reducing stress and inducing positive emotions. Technologies for interactive sonification of dance movement combines aspects of dance and music at the same time by translating movement sensor data into sound and music, and if designed carefully they can have a considerable potential for many of the same health and well-being effects that music and dance have separately. For example, they often tend to imply feedback loops where a movement first will generate a sound, and then in turn can motivate the user to move as a response to the sound. Through the possibilities of generating and controlling musical parameters on higher levels, interactive sonification of dance movement can afford degrees of inclusion that surpass that of e.g. traditional instruments, which often require years of training to master. This is also why interactive movement sonification can offer people with different kinds of disabilities a way of playing music through their movements, and thereby a way of generating positive experiences of basic psychological need satisfaction as well as other elements of well-being like positive emotions, engagement, relationships, meaning, and accomplishment. The paper will show how two different interactive systems/devices using two sensing technologies both afford these kinds of positive health and well-being potential, namely the MotionComposer and the VibraChair, where the author has been engaged in the development of both. Whereas the former is a well-established product in its third version, the latter is still in its exploratory stages of development. The paper will discuss and compare different aspects of the systems/devices, and conclude with some general suggestions for design aiming for positive health and well-being effects.

The MotionComposer: a movement-music device for persons of all abilities

Robert Wechlser
MotionComposer GmbH

The MotionComposer is a device that turns movement into music. It is for persons of all abilities, including those with severe mental and physical limitations. It uses two video cameras (stereovision technology), offers rich and varied soundscapes, and is being used today by 50 institutions and schools in Europe. The authors, who are among its developers, will demonstrate its functions and discuss a challenge which has been at the heart of its development over the past ten years, namely, that interactive movement-music devices need to satisfy two sometimes conflicting priorities: one the one side, they must provide a clear causal relationship so that users are convinced that they are actually playing the music which they are hearing, and yet at the same time, users should have an intuitively-felt and enjoyable experience, in other words, the experience should concern music and dance, and not only the "magic trick" of triggering sounds in the air. In the separate session for practical demonstration, visitors will have the opportunity to use the device.

A nonverbal first-person approach to artistic human-computer interaction

Jin Hyun Kim

Humboldt-Universität zu Berlin

Within the scope of the Sentire project, the micro-phenomenological interview technique was used to investigate the extent to which an interactive music system serves as a therapeutic vehicle, allowing users to experience the self and others in an interactive sound environment. This research question is related to our initial thesis that the sonification of proximity and touch enhances body awareness and self-experience dependent on the experience of others and consequently promotes social interaction.

The micro-phenomenological interview technique has been developed since the mid-1990s within the framework of the neurophenomenological research program to explore the possibility of a mutual influence between data collected through the third-person perspective and first-person data. The micro-phenomenological interview technique seeks to produce a model for the structures of experience, accounting especially for its temporal unfolding.

In the first part of this talk, the methods and results of our micro-phenomenological interview studies that were conducted immediately after each couple therapy session using Sentire are presented. In the second part, the possibility to develop a nonverbal approach to micro-phenomenology serving as a complement to the traditional language-centered one will be discussed. An artistic presentation using Sentire entitled »Moving, hearing, and feeling: A dancing micro-phenomenological interview in a musical sound environment«, which will follow this talk, is part of the artistic-scientific research project that investigates the roles of a nonverbal first-person approach to the science of experience in general and to artistic human-computer interaction in particular. This project ties in with the philosopher Sheets-Johnstone's theoretical claim that movement is fundamental for felt experience and that a first-person approach should be integrated into a scientific investigation of felt experience.

From self to others: Soma design, wellbeing and homeness

Claudia Núñez-Pacheco
KTH Royal Institute of Technology

In this talk, I will describe the practices and processes involving soma design, a methodology that uses our senses and subjectivity to create interactive technologies. Informed by the philosophy of somaesthetics by Richard Shusterman, this approach represents a shift from the current predominantly symbolic, language-oriented stance in interaction design and human-computer interaction (HCI) to a first-person, felt, aesthetic standpoint influencing the design process and use cycle. This method has been used to design technologies for well-being, helping users become aware of their bodies from a non-quantified, expressive perspective. In this presentation, I will introduce a series of soma design exemplars, including research in collaboration with my colleagues at the Department of Interaction Design at KTH Royal Institute of Technology, Sweden. Then, I will focus on my work involving the exteriorisation of biodata through Pulsante, an interactive art installation designed to comply with a pedagogical function, bringing scientific knowledge on the anatomy of the heart closer to a family-friendly audience. We also aimed to help the audience to become aware of their bodies and to gain an appreciation for the vitality of the heart, which performs a crucial function that is usually taken for granted. However, circumstances surrounding the exhibition, as well as other associations emerging from the direct interaction with the materiality of the piece, offered a series of revelations connected with the idea of the body and homeness that we – the researchers and creators of this piece – did not anticipate.

Transformative listening – Sonic interactions in lived social environments

Jan Schacher

Sibelius Academy, University of the Arts Helsinki

The presentation will outline the development of a research practice that combines sonic arts and digital music approaches with a social engagement and community well-being focus. This research is carried out by artist-researchers with experience in participatory design methods, arts-based processes around musical sharing, and qualitative inquiries through experience explication.

Located at the margins of habitual music production contexts, situated listening and sounding approaches function as social and environmental practices. By extending the boundaries of established forms of music making and consumption, participatory music and sound-arts processes stimulate an active engagement of non-experts and lay persons with their everyday contexts. Shared exploratory music and sound interactions function first through guided listening practices situated in lived environments, then through active sound-art and music creation processes, that are finally carried back to the community.

As a mode of articulation of experience beyond language, the proposed practices transform listening into the foundation of an active expression of identity and social cohesion. Immediate agency is given to the listener with the use of technical tools that enable the act of listening to become a productive means of sound and music creation. This approach allows to circumvent cultural imperatives about music and instrumental learning curves, and by eschewing a focus on virtuosic musicianship, can transform the exploratory listening moment into an affirmative expressive performance.

What is particular to the presented approach is that it establishes and operates in a feedback loop between situated listening, shared perceptual experience as listening-together and listening-to-listening, and transformed/transformational listening and sounding. The fundamental insight is that these practices allow an enacting of the—sonic and social—world via sound and music making.

The method presented here extends artistic practices established in digital arts, sound arts, and interactive music, and as central objective deliberately moves towards social, communal, and individual well-being.