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ISon 2019

Interactive Sonification Workshop

Monday, November 18, 2019

Place: KTH Royal Institute of Technology, Lidstedtsvägen 3, floor 4, [room 1440 Bibliotek](#)

09:30-10:00 Registration and Coffee

10:00-10:10 Welcome

10:10-12:00 Paper Session, Oral presentation

- 10:10-10:30
 - Towards interactive sonification for monitoring of dynamic processes (Niklas Rönnerberg)
- 10:30-10:50
 - Interactive Sonification for Correction of Poor Sitting Posture While Working (Kotaro Okada and Shigeyuki Hirai)
- 10:50-11:10
 - Communicating Gait Performance through Musical Energy: Towards an Intuitive Biofeedback System for Neurorehabilitation (Prithvi Kantan and Sofia Dahl)
- 11:10-11:30
 - CardioScope: ECG sonification and auditory augmentation of heart sounds to support cardiac diagnostic and monitoring (Andrea Aldana, Marian Weger, Steffen Grautoff, Robert Höldrich and Thomas Hermann)
- 11:30-11:50
 - Developing movement sonification for sports performance: A survey of studies developed at the Institute of Movement Science (Benjamin O'Brien, Adrien Vidal, Lionel Bringoux and Christophe Bourdin)

12:00-13:00 Lunch. Lunch is not provided, but there are a good selection of restaurants on campus and can be found here: <https://ths.kth.se/restaurants>, <http://www.systerbror.se/>, <http://www.hors.se/restaurang/restaurang-q/>, <https://restauranglabbet.se/>, <https://storiescafe.se/cafe/kth-stories/>

13:00-13:45 Keynote: [Kia Höök](#), Professor at the Division of Media Technology and Interaction Design, KTH Royal Institute of Technology

Soma Design -- intertwining aesthetics, ethics and movement

I will discuss soma design —a process that allows designers to examine and improve on connections between sensation, feeling, emotion, subjective understanding and values. Soma design builds on pragmatics and in particular on somaesthetics by Shusterman — combining soma as in our first person sensual experience of the world, with aesthetics as in deepening our knowledge of our sensory experiences to live a better life. Soma design engages with bodily rhythms, touch, proprioception, bodily playfulness, but also with our values, meaning-making processes, emotions, ethics and ways of engaging with the world. Soma design also provides methods for orchestration of the ‘whole’, emptying the digital and physical materials of all their potential, thereby providing fertile grounds for meaning-making and engagement. Soma design is imbued with ideals of what a better life might be.

In my talk, I will discuss how aesthetics and ethics are enacted in a soma design process. Our cultural practices and digitally-enabled objects enforce a form of sedimented, agreed-upon movements, enabling variation, but with certain prescribed ways to act, feel and think. This leaves designers with a great responsibility as these become the movements that we invite our end-users to engage with, in turning shaping them, their movements, their bodies, their feelings and thoughts. I will argue that by engaging in a soma design process we can better probe which movements lead to deepened somatic awareness; social awareness of others in the environment and how they are affected by the technology-human assemblage; enactments of bodily freedoms rather than limitations; and aesthetic experience and expression.

13:45 -14:30 Papers, Oral Presentation

- 13:45-14:05
 - Speed sonification in a unimanual timing and a bimanual coordination tapping task (Magdalena Gippert, Tobias Heed and Thomas Hermann)
- 14:05-14:25
 - Sonic Feedback of Performance Error while Controlling a Laptop Touchpad as Laptop Orchestra Chamber Music (Michael Blandino)

14:30-15:00 Coffee at MIDDLEA

15:00-18:00 Design Fiction workshop: “The soundscape of the future”

Place: two labs located at the same address [Lindstedtsvägen 5](#), [MIDDLEA Designstudio](#), and [Multisensory Studio \(room 4633\)](#)



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1st NORDIC SMC 2019

Tuesday, November 19, 2019

08:45 - 09:00 Registration **SEE BELOW: WE HAVE CHANGED TO ROOM "FANTUM" IN LINDSTEDTSVÄGEN 24** <https://www.kth.se/places/room/id/c9ec01ab-b536-4be6-b82a-0d52ddadb2e6>

09:00 - 12:00 BELA Workshop

Place: KTH Royal Institute of Technology, [Lindstedtsvägen 5, MIDDLE Designstudio](#)

THE WORKSHOP HAS MOVED LOCATION TO ROOM "FANTUM" IN LINDSTEDTSVÄGEN 24 <https://www.kth.se/places/room/id/c9ec01ab-b536-4be6-b82a-0d52ddadb2e6>

Due to a huge interest in the workshop we needed to move to a bigger room.

This is a hands-on introduction to how Bela (<https://bela.io>) can be used for realtime interactive sonification. The workshop is led by Astrid Bin (<https://www.astridbin.com/>), one of the Bela creators. You will work with Bela boards equipped with gesture sensors (hardware is provided). - Coffee provided at 10:00

12:00 - 13:00 Lunch.

Lunch is not provided, but there are a good selection of restaurants on campus and can be found here: <https://ths.kth.se/restaurants>, <http://www.systerobror.se/>, <http://www.hors.se/restaurang/restaurang-q/>, <https://restauranglabbet.se/>



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1st NORDIC SMC 2019

Tuesday, November 19, 2019 13:30-18:00 Oral session at KMA

Royal Swedish Academy of Music

Place: [KMA Royal Academy of music, Blasieholmstorg 8](#)

Best way of travelling to KMA is to take the Red line of T-Bana (tube) at Tekniska Högskolan from KTH (enter the first car of the train) and get off at Östermalmstorg .

13:30 - 13:50 Registration

13:50 - 14:00 Welcome

14:00 - 14:40 Oral session Paper presentations

- 14:00-14:20
 - Sonification for Process Monitoring in Highly Sensitive Tasks (Sasan Matinfar, Thomas Hermann, Matthias Seibold, Philipp Fürnstahl, Mazda Farshad and Nassir Navab)
- 14:20-14:40
 - *pya* – a Python Library for Audio Processing and Auditory Display (Thomas Hermann and Jiajun Yang)

14:40-18:00 THE BILL BRUNSON SESSION WITH MUSIC

14:40-14.55 **Opening** (Henrik Frisk and Annika Ostenfeld Åkerblom) *To honour Bill – Bill's work over the years and his contribution to research on music and artistic research. We will also make a short presentation of an ongoing study on the epistemological development of artistic research in Sweden: What are the origins of these forms of knowledge and how have the needs for this knowledge been handled prior to the development of artistic research?*

- 14:55-15:15
 - **The Visual Representation of Spatialisation for Composition and Analysis.** *The motivation for this text is my ongoing research into creating a uniform and comprehensive notation system for music regardless of sound sources, acoustic or electronic. I propose a way to visually represent the positions and movements of sound in composition and analysis of music which in different ways utilises space as a parameter. I address a number of aspects of spatialised music to take into account when defining a notation language for the music. I suggest visually*

representing the room in different ways depending on how the music relates to the concept of space: as projections from the center of a sphere for more structural work, or as coordinates in a cubic room for works that depict a physical or imagined space. I also show how these descriptions of space are integrated with my existing notation system. (Mattias Sköld)

- 15:15-15:25

- **Princess Bat** (Kim Hedås)

- 15.25-15.45 Coffee break

- 15.45-16.05

- **Immersive Music Interaction for Everyone.**

This study seeks to understand how new and accessible technology can be used and developed to include producers of standard music into making immersive, interactive, music experiences. Through observations during a student project and an analysis of the participant's reflections it argues that even if the technology worked well, there are still many opportunities for improvements. The result shows that the repeated, non-creative, tasks like exporting and naming files can reduce musical inspiration for students with little interest in technology and that further development and studies potentially could make interactive music accessible even for them. The aspect of the project that caused most positive response was producing and mixing for super-surround which led the students to new insights and ideas for their everyday music production. Finally the result indicates that even if there would have been no technical barriers interactive music production might not appeal to everyone. Interactive music should maybe be seen as a separate discipline and students with a linear approach to composition will not necessarily find it interesting. (Hans Lindetorp)

- 16:05-16.25

- **Towards a hyper modular ensemble morphology.**

Presentation of a recently started PhD project in composition dealing with an alternate view on collections of musical instruments that takes concepts like agency and polymorphism into consideration. The project explores how concepts from object oriented programming and the patching paradigm derived from modular synthesis can aid in reaching for a new kind of ensemble instrument and musical morphology in which both human and nonhuman agents are equals. (Mattias Peterson)

- 16.25-16.45

- **With Music as a Script: Intermedial narrative between classical art music and moving image.**

The purpose of this study is to interpret and visualize art musical form and content with the help of moving image. The moving imagery focuses on the playing musician and the gestures that arise when the music is played.

The study is conducted on the basis of the following research questions:

- *How can musical content be lifted using film as a tool?*
- *How can the musical experience be enhanced with visual impressions?*
- *What impression does the music have in the film - can the film be reused to new compositions?*

A recurring view is that classical art music should be consumed as it is and usually does not need any further stimulation of the mind. When classical art music is

presented today with a moving image, it is often a matter of an image production that has the task of reproducing the situation of the actual concert. Studies show that the picture tends to dominate when music is combined with moving image. One of the reasons for this is that the visual mind accounts for 80% of the impressions the brain processes. The result is that the recipient's attention to the musical process deteriorates or is disturbed, thus reducing the musical intrinsic value. The method of avoiding this is to create an imagery that has the task of lifting and highlighting musical form and content. With the help of small cameras this is investigated in practice. The moving image layers (films) are then placed on top of each other with different opacity. The image layers then interact in the finished film where musical form and content are lifted. Four labs have been conducted, resulting in four films, one focusing on a percussionist and three focusing on a pianist. The purpose of this conference presentation is to show parts of these films and to report experiences from this ongoing project focusing on questions about how a moving imagery can be designed for the viewer / listener to see and hear intermodally. By extension, the problem formulations are also based on the new intermedial aspects that arise when the music and, the film intended for the music, interact with each other. To what extent does each of the media retain their identity and when, and to what extent, something new arises and is established? (Johan Fröst)

- 16.45-17:00 Music

- **Excelsior** (Katt Hernandez)

- 17:00-17:20

- **Don't forget about MIDI! A case study of an innovative church organ recording.**

What is the best way to record that big beast? This issue is central to many of us who have faced the challenge of recording one of the perhaps most traditional of all musical instruments: Church Organ. This text describes a recording project where modern music production technology innovatively was used to record a church organ. The primal purpose of the recordings was to make a documentation of how the recorded church organ sounds after a major renovation. One problem was that disturbing road noise from traffic close to the church made it very difficult to record in the daytime. Therefore the recordings were done in the night when the surroundings were more silent. During the renovation, a new digitally controlled remote console was installed which is connected with the old pipe organ in the stands. MIDI is used for musical communication between the remote console and the organ. MIDI technology was used during the production work in an innovative way solving some of the production problems. Instead of playing the music live during the recording sessions, the music was first recorded digitally in music production software using midi sequencer software. This was carried out in daytime over a long time period. During the actual acoustic recordings the organist, instead of playing live, started playing back the pre-recorded music live in the organ. And all the music was recorded acoustically during one night. The recordings resulted in a CD-record that is a true documentation of how the organ sounds live, even though the recordings actually were programmed over a long time. This technology opens up for innovative options for e.g. future compositional work or artistic performances. Experiences från this project also emphasizes the importance of developing future

work as well as education where art and technology can cooperate and strengthen each other. (J-O Gullö)

- 17:10-17:25 Music
 - **Abelian Axioms** (Torbjörn Gulz)
- 17.25-17.45
 - **Sound and Music as a source of innovation.**
How are we affected by the sounds and music around us? Can we use music to convey our emotions? Can sound affect how we move? How do we interact with sound and music in everyday life, and how will we do it in the future? How does a robot sound? In this paper the author presents results from some research projects at KTH which can help in providing answers to these questions. (Roberto Bresin)
- **17:45-18:00 Closing session**



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1st NORDIC SMC 2019

Wednesday, November 20, 2019

Place: KTH Royal Institute of Technology, Lindstedtsvägen 26, [Room F3](#)

08:30 - 09:00 Registration

**09:00 - 09:45 Keynote: [Ulf Olausson](#)
Making Film Sound Real**

09:45 - 10:25 Oral Session

- 09:45-10:05
 - Efficient Rendering and Perception of Acoustical Environments in Augmented Reality Audio (Alex Baldwin, Jonas Holfelt and Cumhur Erkut)
- 10:05-10:25
 - MahlerNet: Unbounded Orchestral Music with Neural Networks (Elias Lousseief and Bob L. T. Sturm)

10:25 - 10:45 Coffee break

10:45 - 12:15 Oral session Paper presentations

- 10:45-11:05
 - Design of an In-Lab Experimentation Rack System for the ACUTE Multi-Channel Tactile System (Elvar Atli Ævarsson, Mathias Lyneborg Damgaard, Árni Kristjánsson and Runar Unnthorsson)
- 11:05-11:25
 - Rhythm as Sensorimotor Support for Gait Disturbance Caused by Neurological disease (Maria Svahn and Josefine Hölling)
- 11:25-11:45
 - Distant Reading Strategies Aiding the Composition of New Idiomatic Music for Classical Guitar (Giovanni Albinì and Matilde Oppizzi)
- 11:45-12:05
 - Bass as an indicator of quality : The relation between bass levels and quality perception in headphones (Martin Linder Nilsson and Johannes Loor)
- 12:05-12:15 Discussion concluding the session

12:15 - 13:30 Lunch. Lunch is not provided, but there are a good selection of restaurants on campus and can be found here: <https://ths.kth.se/restaurants>, <http://www.systerobror.se/>, <http://www.hors.se/restaurang/restaurang-q/>, <https://restauranglabbet.se/>, <https://storiescafe.se/cafe/kth-stories/>

13:30 - 14:15 Keynote: [Eleonora Maria Irene Oreggia](#), Queen Mary, University of London

Audiovisual performance composition using electromagnetic waves

The enigma of the electromagnetic field is explored from a perceptual perspective, transforming it into a sensor system for contactless interaction and rendering it musical material that can be present to the mind.

The relation between the human body, the perpetual capability of the senses and the subsequent image of reality is questioned: can technology expand the senses and become a method to discover new forms of perception?

The result of this imaginative and speculative approach to engineering is REBUS, a novel, fully programmable musical instrument that innovates the 100 years old Theremin technique, allowing a new dimension for interactivity and expressivity in new media art and electronic music.

14:15 - 15:00 Coffee break Poster and demo session

- Presented posters:
 - Sonic footprints of web tracking (Otto Hans-Martin Lutz and Manfred Hauswirth)
 - BLESync: Wireless Synchronization Between Computers and Tap-Tempo Effect Pedals (Juan Pablo Carrascal)
 - A Lightweight Framework for Melodic Information Encoding and Real-time Reproduction for Interactive Sonification Applications (Prithvi Kantan)
 - The MUST Set and Toolbox (Ana Clemente, Manel Vila-Vidal, Marcus T. Pearce and Marcos Nadal)

15:00 - 16:20 Oral session Paper presentations

- 15:00-15:20
 - Student involvement in sound and music research: current practices at KTH and KMH (Kjetil Falkenberg Hansen, Roberto Bresin, Sandra Pauletto, Andre Holzapfel, Mattias Sköld, Hans Lindetorp and Torbjörn Gulz)
- 15:20-15:40
 - Performance of Piano Trills: Effects of Hands, Fingers, Notes and Emotions (Xu Han and Roberto Bresin)
- 15:40-16:00
 - Evaluation of Two Music Tactile Display Encodings for Cochlear Implant Recipients (Mathias Lyneborg Damgård, Elvar Atli Ævarsson, Runar Unnthorsson and Árni Kristjánsson)
- 16:00-16:20
 - Estimation of pinna notch frequency from anthropometry: An improved linear model based on Principal Component Analysis and feature selection (Riccardo Miccini and Simone Spagnol)

16:20 - 16:45 Discussion and final remarks

18:00- 19:30 Concert at KMH Royal College of Music (free entrance)

The performances take place in two parallel tracks in *Lilla Salen* and *Nathan Milstein Hall* where it is possible for the audience to walk between the two halls, sometimes even during the performances. In the foyer a movie is continuously played by Annette Arlander.

The program is curated by Cecilia Roos (SKH Stockholm University of the Arts) and Henrik Frisk (KMH Royal College of Music).

Time	Place	Title	Name
18:00-19:30	Fojén	Att uppträda/samarbeta med växter	Annette Arlander
18:00-18:30	Milsteinsalen	Meandering, riddle & story-board - improvising folk songs	Susanne Rosenberg (KMH)
18:00-18:30	Lilla Salen	Visit	Kim Hedås (KMH)
18:30-19:00	Milsteinsalen	Pendlingar – det vokala uttryckets förvandlingar inom teater och opera	Wilhelm Carlsson (SKH)
18:30-19:00	Lilla Salen	Dö bra	Rebecca Hilton (SKH)
19:00-19:30	Milsteinsalen	Musik i oordning	Klas Nevrin / Cecilia Ziliacus (KMH)