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Faculty of Arts

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*THESES OF THE DOCTORAL DISSERTATION*

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# The Dialogue of the Senses

The Aesthetics of Interactive Sonification

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Budapest  
2010

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## The goal of the dissertation

The dissertation addresses the topic of sonification (auditory display), particularly in the aesthetical approach of image – sound mapping and the possibilities of interactive methods. At this time there is no much information about the aesthetical bounds of the interactive sonification, and the competence in (musical-)aesthetic of the whole field of sonification is not standing steady on its legs, because his critic departs from the experiences of the subjective sign-system of artificial synesthesia, or on the other hand tries to find the „musicality,“ aestheticising the result of the sonified data. In contrast with this, the community of auditory display seeks to exclude the aesthetical critic of the sonic result, being simple (but clear) mirrors of the complex data structures and pictorial presentations.

If we talk about discourse of the senses, we can find our sources not only in the coherence of seeing and hearing, rather in the active perception of the hearing itself. The relation between **sound and interaction** is a rather old interweave-phase in the history of communication.; we watched their last meeting by changing the form of music from the mimetic function to the state of  $\mu\epsilon\theta\epsilon\xi\iota\zeta$  (metexis), towards the **cooperative** act, the process of participation.

My point of inception is also this situation on the one hand; and the strong connection of human and technological environment on the other, where the communicative and aesthetic function of sound is still in unity. From this point I would like to present, how can the circulation of sounds in different functions can reply to the needs of interaction between human and environment. By the nature of the research it finds parallels in the paradigm emerged by *John Cage* and his followers in music, fine and sound arts, which deconstructs the bounds between the management of musical time and material, between the intentional and non-intentional sounds, by rethinking the capabilities of the performative act, closing together the music and everyday life, renaming or erasing the definition of music like *experimental music* (Michael Nyman), *organised sound* (Leigh Landy), *sound art* (Julia Gerlach) or sound media art (Simon Emmerson). My main purpose is to create the aesthetical web reflecting in such a tendency, which excludes itself from the domain of aesthetics. Because the **sonification** is outsider of the mentioned field of

sound art in the sense that it only uses the conventions of music for sonifying the soundless signals, so it transfers the everyday information to the artistic domain, reversing the efforts of the idea of the avantgarde and postmodern about the relations of art and everyday life. My goal is not to rehabilitate by (re)aestheticizing the sonified data and information, rather to ground the bounds of an experiment in interpretation, which – like the history of music, through the language of notation, mapping and visual coding, – builds on sonification, opening the possibility for expanding the intermodal perception by sound.

## **The structure and methods of the dissertation**

*Without doing phenomenology, it may be practically impossible to understand phenomenology* – states Don Ihde at the beginning of his book titled *Experimental Phenomenology* in 1977. This doctoral dissertation has the same effect in the background: the research and evaluation of an aesthetical proposal can be done only through the praxis of realizing it. My proposal is still looking for answers in the question: is it possible to make the listening active, can cooperate the senses towards the renewal of the arts of listening? The answers can only be developed by collecting the realized examples and experiments, step by step fastened the concept of interactive sonification, and the verbs of negative aesthetics in the background.

### **Chapters 2.1-2.3.**

After the introductory part the work begins with a widely sampled, but regarding the topic narrowly filtered grounding in the field of the aesthetics of music and phenomenology of hearing, towards the story of the self-aesthetised hearing (and the audible world; chapter 2.1.), of the formalized music (chapter 2.2.), and the resolution of interaction and sounds (chapter 2.3). The three chapters introduce the ideas of active or ecological listening; mobilized music; interactive hearing. The idea of ecological listening is developed by interpreting the phenomenologies of sound by *Don Ihde*, then explained by *James J. Gibson*, *Eric F. Clarke* and *Marc Leman* and from different domain, *Alva Noë*. The notion refers that the listening is not just a receiving event, but an activating process of the whole body, tending to the equalized

discourse of the perceiver and the outer world. It can be demonstrated well by the gestalt principles, eg. the capability of form-constructing attributed to the senses; or by the radical forms of sound art building of the sense of hearing (acousmatic music, field recording, etc.) After establishing the hearing-act, the second introducing chapter presents the interactions of the music concepts in the 20<sup>th</sup> century and the linguistic formalisation. My goal is to demonstrate the interrelations of the musical processes with the specifications of their linguistic, visual and algorithymical medium, pointing out that the recursive conceptualizing process is parallel 1) with the return of linguistic mapping of music, 2a) with the transformation of music to sound, and 2b) the sound mapping to – in it's most general meaning – image. Within this scope I shortly overview the theories of language-as-music (structuralism and semiotics), the transforming of notation to semantic visualization, arrived in the numeric and visual mapping of music of the algorithmical composition. All of these tendencies encourage the music to exceed the dichotomy of autonomy and heteronomy, facing the facts of **embodiment** and mobilizing.

As the previous mentioned chapters introduce the hearing act, and parallelly the reduction of musical act, the chapter 2.3. joins these differencies for realizing the possibilities of the interactive (sonic) work. The open work of art in music is hard to compare with the open forms of performative and fine arts, because the music is fundamentally a form of openness and community act. But the music makes difference between active and passive interaction, and the standardized form is the passive one. The musical interaction has other means as well beside the participation: cooperation in realize and controlling the work, and therefore in being part of the artistic acoustic community (term by Barry Truax).

### **Chapters 3-5.**

The centre of the dissertation, the third chapter entitled *The negative aesthetics of Auditory display*, after summarizing the results of the last 20 years of research, proposes the introduction of the interactive methods in sonification. In this context I present the structure of my and some general works, including the works based on computer vision (chapter 4). As final conclusion I define and demonstrate the working methods of the aesthetically adaptive sonification.

While presenting the techniques, I attempt locate the discussed artistic forms in the disciplined aesthetical discourse (2.1.3, 3.1.2, 3.4, 3.5), with the following conclusion (chapter 5): the sonification contributes in the emerging a definition of music which is not only for the ears, but intermodal, and the opposite of it, is independent from its medium or material interface, while it is sensitive to the feedback, the user participation; self-adjusting, and – on the end – it is the unrecognizable mirror of the self.

It could be regard as sidechain, but – referring to the title of the study – is important to the conclusions mentioned: the introduce of **intermodal interaction**, which covers the reinterpretation of the intermodal transfers from the point of view of the sonification (3.1. and 4), and the explaining of the amodal (sensory-independent) interface.

## Argumentation

4. Sonification and intermodal tran discourse; the forms of interactive sonification (Thomas Hermann) and CV based sonification; 5. the definition of amodal and transparent interface		
↑		
3. The history of the intermodal transfers to the hearing (artificial synaesthesia, audio-vizuality; Michel Chion) → the theories of auditory display (Gregory Kramer) → the sketches of adaptive interaction → aesthetical conclusions: the redundant aesthetics of sonification		
↑	↑	↑
2.1. The phenomenological critic of the senses of hearing → auditory turn (Don Ihde) → concept of active listening (Eric Clarke, Alva Noë) → the arts of hearing	2.2. Music and mapping (meaning, discursivity) → the tendencies of formalization→ the materialized and medialized music	2.3. Music as open work (Umberto Eco) → the interfaces of music (instrument vs. manipulation) → acoustical community (Barry Truax)

## Localization of the topic

The dissertation seeks the common borders of the aesthetics of music and computing, the interaction design, the phenomenology of hearing, the auditory display and the digital media arts, and if possible, it tries to approach each others' specific language. With unifying the discussion I would like to contribute in the reintegrating of the aesthetics of music in a contemporary theoretical-practical discourse.

## The concepts introduced in the dissertation

- *hearing as active perception* (2.1.) – the perception which is joint to the action, in a creative way;
- *art of listening* (2.1.3.) – artforms which are built on the autonomy of hearing, for example field recording or acousmatic music;
- *mobilization in music* (2.2.) – the definition of music which is materialized and independent from the place, and also the extension of the emotional-mental world of the human;
- *active and passive interaction* (2.3.) – the passive interaction covers the most unintentional and unobservable form, while the active interaction covers the directed communication;
- *sonification as redundance* (3.5.) – as mapping of an another sensory system, the sonification is the extension of a sense. As is, the redundance and iteration seems to be unrecognizable, therefore it is like a new stimulus which is independent from the original modalities;
- *transparent and amodal interface* (5.): the type of interface which uses the same modality and communication as the result of the interaction; for example, the voice menus in the telephone.



## Publications and works in the topic

### Studies and essays:

Kovács Balázs, “Audio-vizuális pingpong”, Demonstrating sonification-visualization, In: *Balkon*, 2003/12.

Kovács Balázs, “Az underground alternatívája: Hungaroton – kortárs zene a '70-80-as években”, In: *Avantgárd: underground: alternatív – Popzene, művészet és szubkulturális nyilvánosság Magyarországon*, Kijárat – Artpool – PTE Kommunikációs Tanszék, 2003.

Kovács Balázs, “Rekurzív kompozíciók és hangszintézis lehetőségek MaxMSP segítségével”, In: *Symposion* 2006. 47-49. sz.

Kovács Balázs, “Chowning és az elektroakusztikus zene auditív fordulata”, In: *Médium, hang, esztétika – Zeneiség a mediális technológiák korában*, Ed. by Batta Barnabás, Szeged, Univ Kiadó, 2009.

Kovács Balázs, “The impossibility of the geometrical hearing”, *PAGE 2009. konferenciakötet – Ott különszám*, Ed. by Fenyvesi Kristóf

### Translations:

Kim Cascone, “A hiba esztétikája: Poszt-digitális tendenciák a kortárs komputerverzenében”, tr. Kovács Balázs, In: *Balkon*, 2003/12.

John Chowning, “Az észlelés egysége és a hallásperspektíva”, tr. Kovács Balázs, In: *Médium, hang, esztétika – Zeneiség a mediális technológiák korában*, Szerk. Batta Barnabás, Szeged, Univ Kiadó, 2009.

### Sonification works:

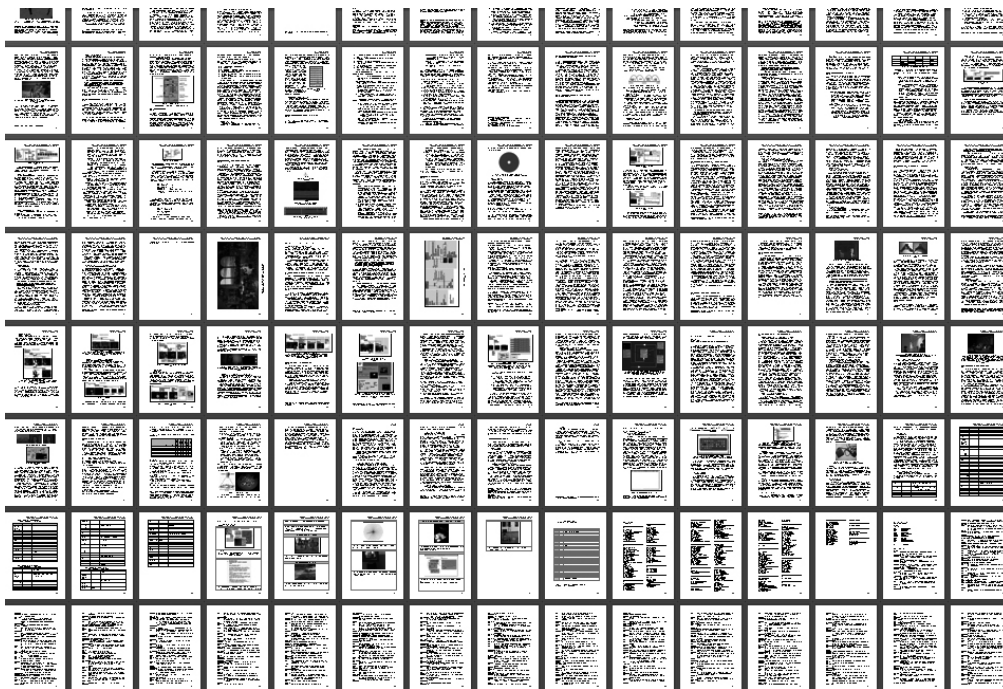
Kovács Balázs, “*Very fast DNA analysis*”, Finalist in the “scientific sonification” category, International Conference on Auditory Display 2009, Copenhagen

Kovács Balázs, “*Lemezborítójátszó*”, 2009. september, Pécs, PTE-MK hall

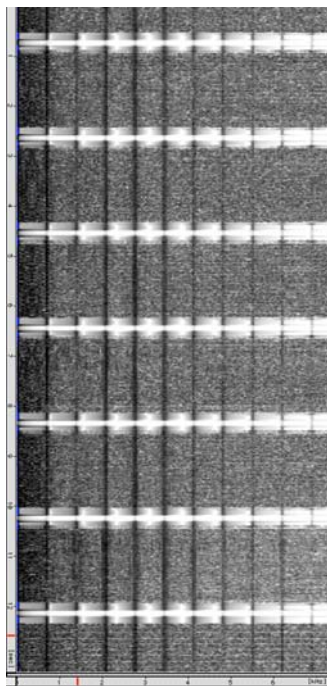
### Presentations:

„A geometrikus hallás kép-telensége“, 2009. júne, Pécs – Ars GEometrica conference

„Networked listening of music“, 2009. december, Budapest, Music in the Global Village conference



90 page of the dissertation in one picture ...



... and the resulting sound after its sonification.

