electronic music practice for neurodiverse people

making accessible contemporary electronic music practice for people with autistic spectrum disorder

till bovermann, 2013
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+ post-doctoral researcher in IxD and tangible auditory interfaces
+ PhD in computer science with focus on sonification
+ runs the TAI studio, a space for work on tangible and auditory interaction

introduction

What is Autism?

> *Autism spectrum disorder (ASD) and autism are both general terms for a group of complex disorders of brain development. These disorders are characterized, in varying degrees, by difficulties in social interaction, verbal and nonverbal communication and repetitive behaviors.*
>
> *[...] Each individual with autism is unique.*
>
> [http://www.autismspeaks.org/what-autism, 9.6.2013]

What is Neurodiversity?

> *Neurodiversity is an approach to learning and disability which suggests that diverse neurological conditions appear as a result of normal variations in the human genome. This term was coined in the late 1990s as a challenge to prevailing views of neurological diversity as inherently pathological, and it asserts that neurological differences should be recognized and respected as a social category on a par with gender, ethnicity, sexual orientation, or disability status.*
>
> [http://en.wikipedia.org/wiki/Neurodiversity, 9.6.2013]

artistic freedom

Many people with ASD depend on external help to manage their daily living. However, life does not stop at its facilitation. Being able to express feelings and emotions by actively partaking in cultural activities is crucial, not only to express emotions but also to give others a chance to listen.

> *The issue of artistic freedom is crucial to any nation. It is not 'just' about the artists' rights to express themselves freely, it is also a question of the rights of citizens to access artistic expressions and take part in cultural life — and thus one of the key issues for democracy.*
>
> *The protection of artistic expression is just as important for the development of democracy as the protection of media workers. It is frequently artists who — through music, visual arts or films — put the 'needle in the eye' and strike a chord with millions of people, some of them unable to read and with no access to express themselves.*
>
> [2013, Ole Reitov]

(Ole Reitov is the program manager of *Freemuse – The World Forum On music & Censorship* and consultant to the UN Human Rights Council for the *2013 report on the right to artistic expression and creation*)

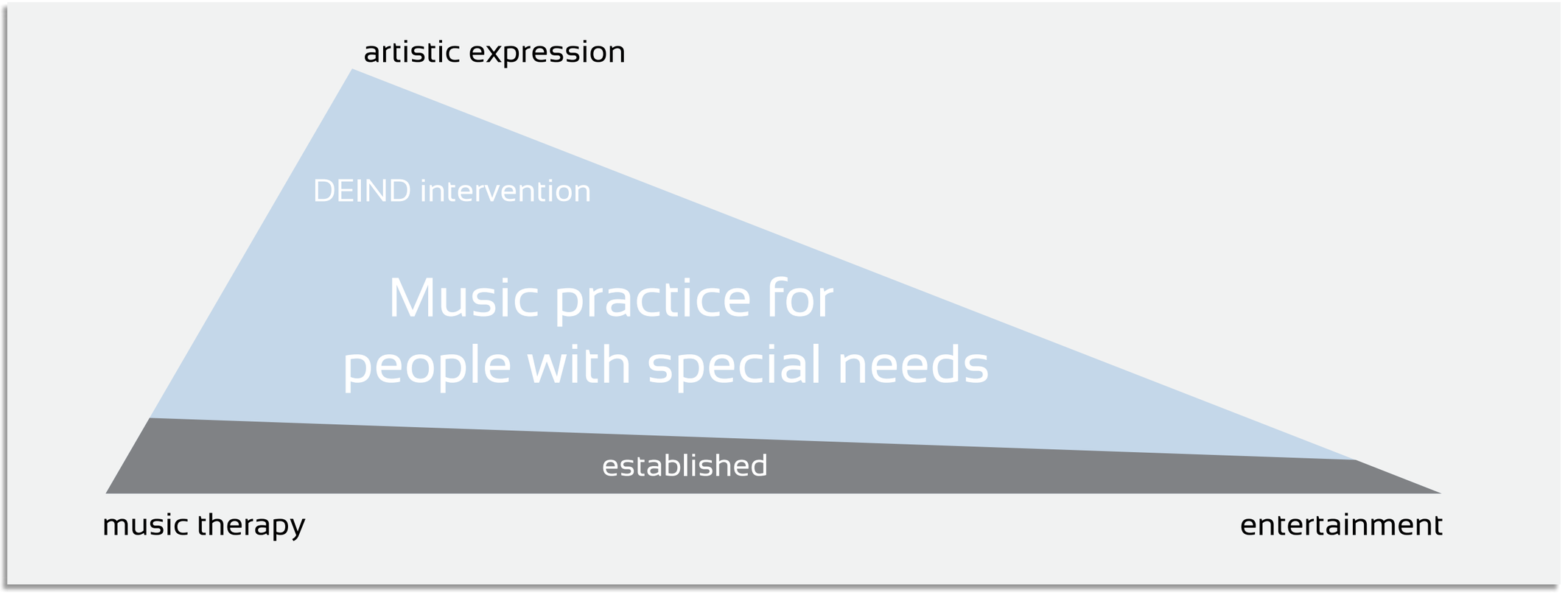
the right for artistic freedom

... does not stop at mainstream culture, it is also valid for niche fields such as contemporary music.

In addition, Headlam argues that contemporary music already adopted some specifics of ND thinking:

> *I show that autistics hear and conceive of music in distinctive ways that differ significantly from the ways in which music is heard and understood by people who are neurologically typical (NT). I suggest that [...] learning to "hear autistically" [...] may be particularly revealing when applied to nontonal music of the last one hundred or so years. This music has many aspects related to autistic characteristics [...].*
>
> [Headlam, D. (2006). *Learning to Hear Autistically*]

functions of music practice



where is the difference?

people with ASD have a unique way to experience their life-world:

in my language, a video by Amanda Baggs
on how she perceives the world

http://www.youtube.com/watch?v=JnyIM1hI2jc

unfortunately, this source turned out to be heavily controversial, so I will not show it here.

http://abaggs.blogspot.fi/

project outline – what are our intentions?

+ connect people with ASD with the field of contemporary electronic and digital music practice
  invite them to take part in the design process of electronic instruments and compositions
+ experience the diversity in thought processes
  gather insights on instrument design for people with ASD
+ look at electronic instruments their usage and design from a non-standard point of view
  i.e. derive more general insights for the involved disciplines
+ have fun

target group

cooperation partners

+ nuorten ystävät
  operates a supervised accomodation in eastern finland hosting 15 people with severe types of ASD
+ resonaari music school
  teaching music to people with special needs in the Helsinki area

[photo by http://www.nuortenystavat.fi]

cooperation partners – research

+ TAI-studio, mediaLab, Department of Media, Aalto University
  Till Bovermann
+ Signal processing group, Deptartment of Electrical Engneering, Aalto University
  Julian Parker, Vesa Välimäki
+ Embodied interaction Lab, Department of Design, Aalto University
  Ramyah Gowrishankar, Jussi Mikkonen
+ TAUKO sustainable clothes, Helsinki
  Mila Moisio
+ Textile Art and Design Degree Program (BA, MA) and Textile and Fashion workshops
  Pirjo Kääriäinen

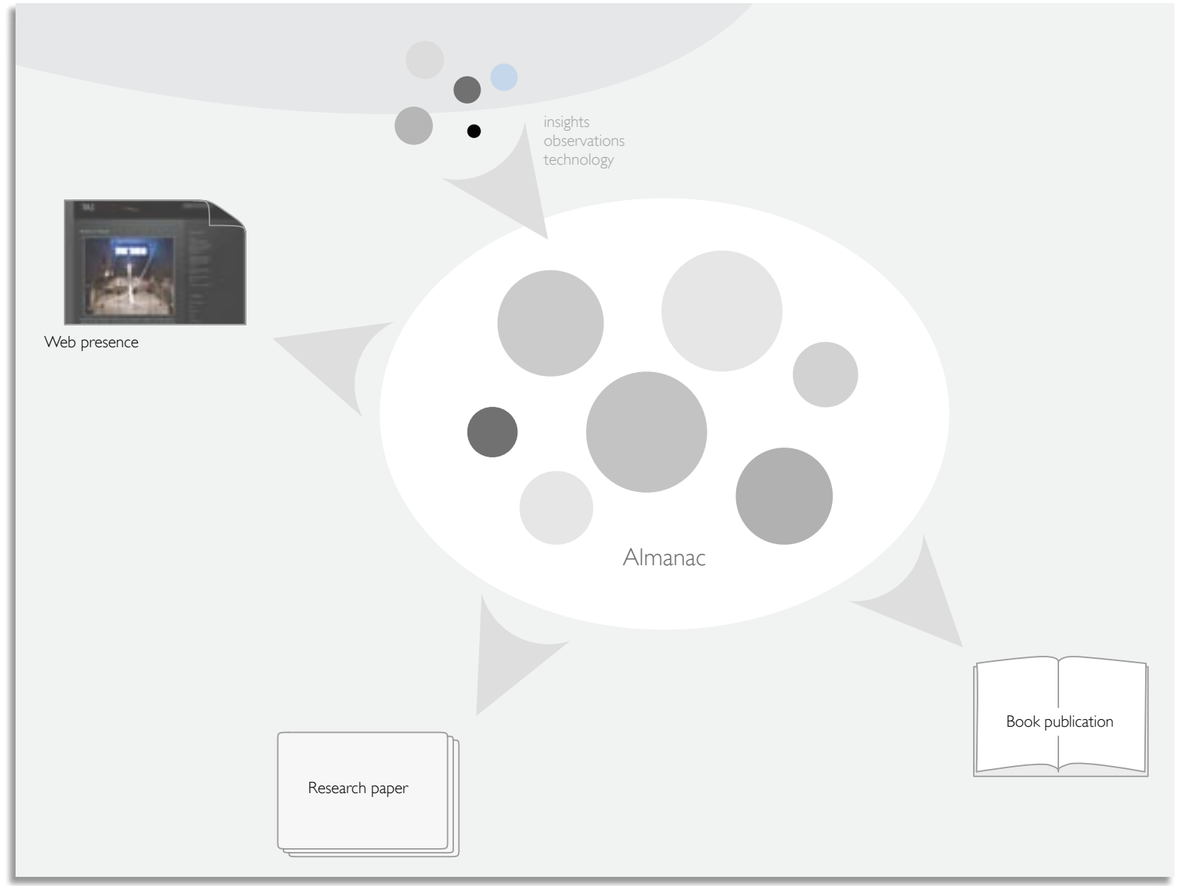
+ Institute for time-based media
  UdK Berlin/Germany
+ Modality Group
  international cooperation of independant artists and researchers to develop musical interfaces

faces


Till Bovermann
computer science, sound, IxD, ...
Mila Moisio
fashion, set design, ...
Julian Parker
dsp, sound, music, ...
Ramyah Gowrishankar
IxD, e-textile, ...

intended results

+ knowledge almanac
  open data process documentation, research database
+ instrument prototypes
  evaluated and real-life tested
+ design guidelines
  how to design and build interactive electronic instruments for people with ASD, generalising to other target groups
+ performances
  personal experiences (performer only) / selected audience / public distribution of recordings
+ scientific articles
  interaction design / autism research / NIME

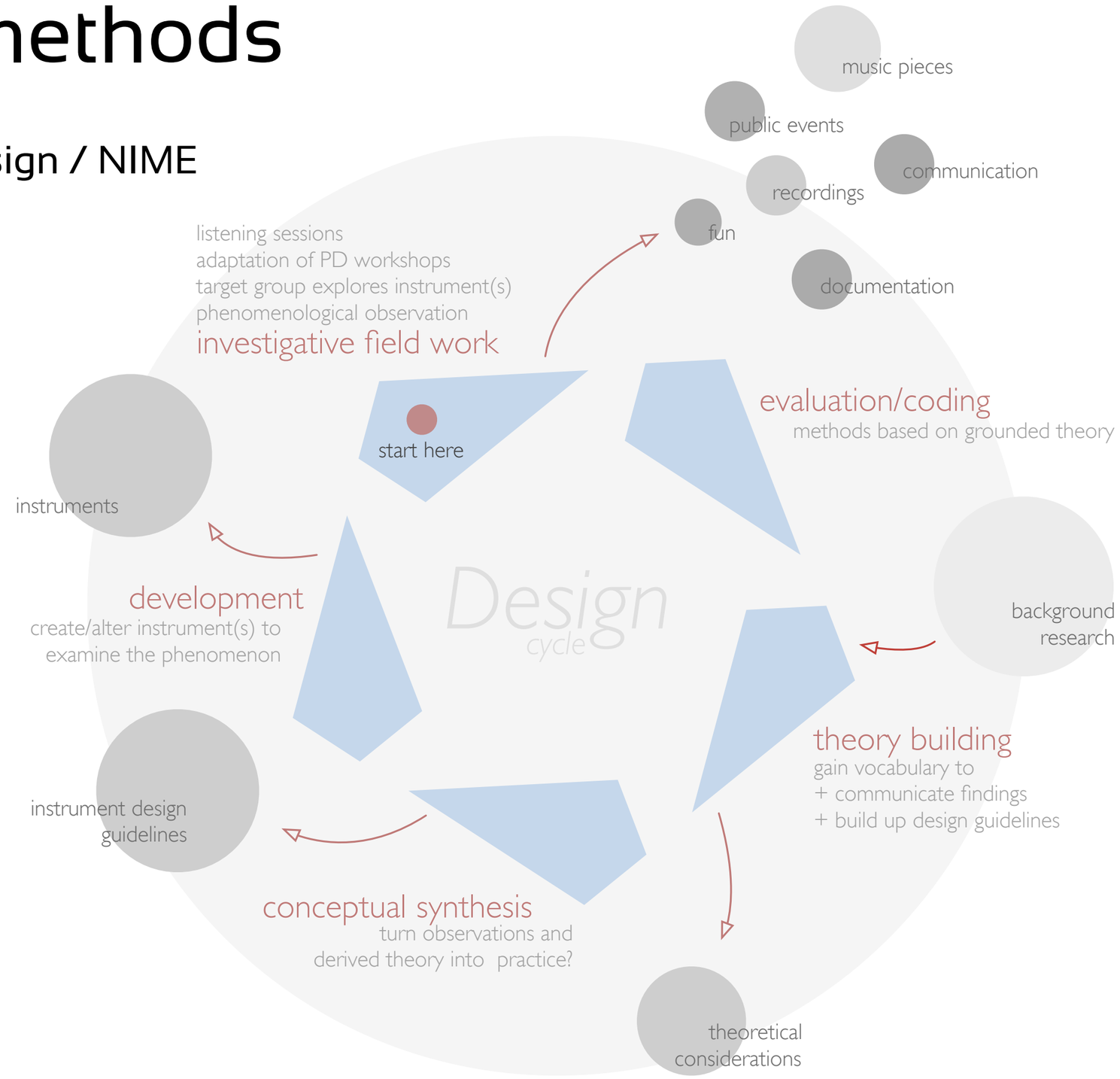


involved fields & methods

IxD / Signal processing / Product design / NIME

methods

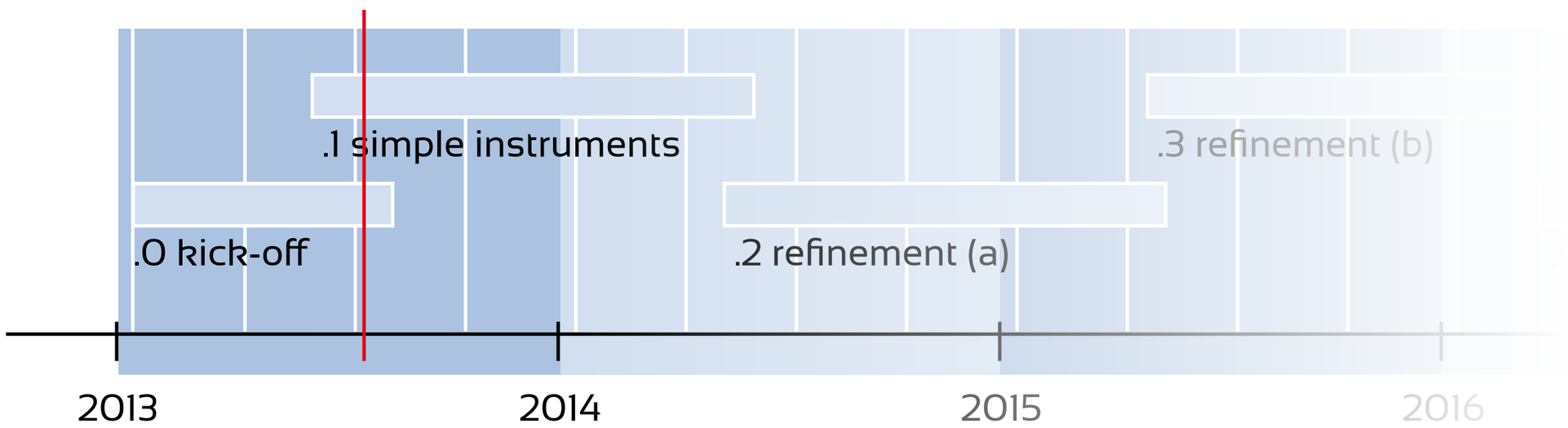
+ **fieldwork**
  based on participatory design, adapted to target group's specific needs
+ **grounded research methods**
  evaluation / coding / theory building
+ **fabbing**
  rapid prototyping with e-embroidery / e-textile / electronics / sound setups



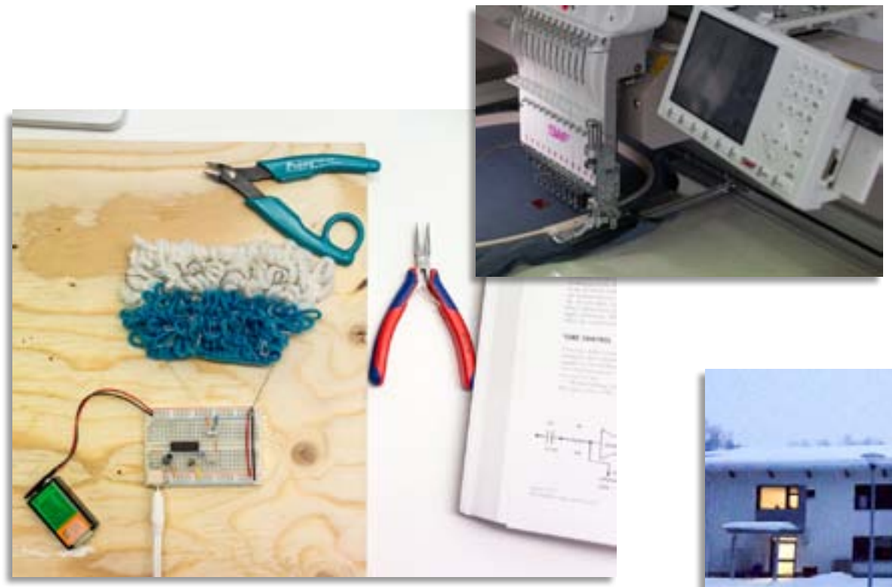
project status

kickoff phase

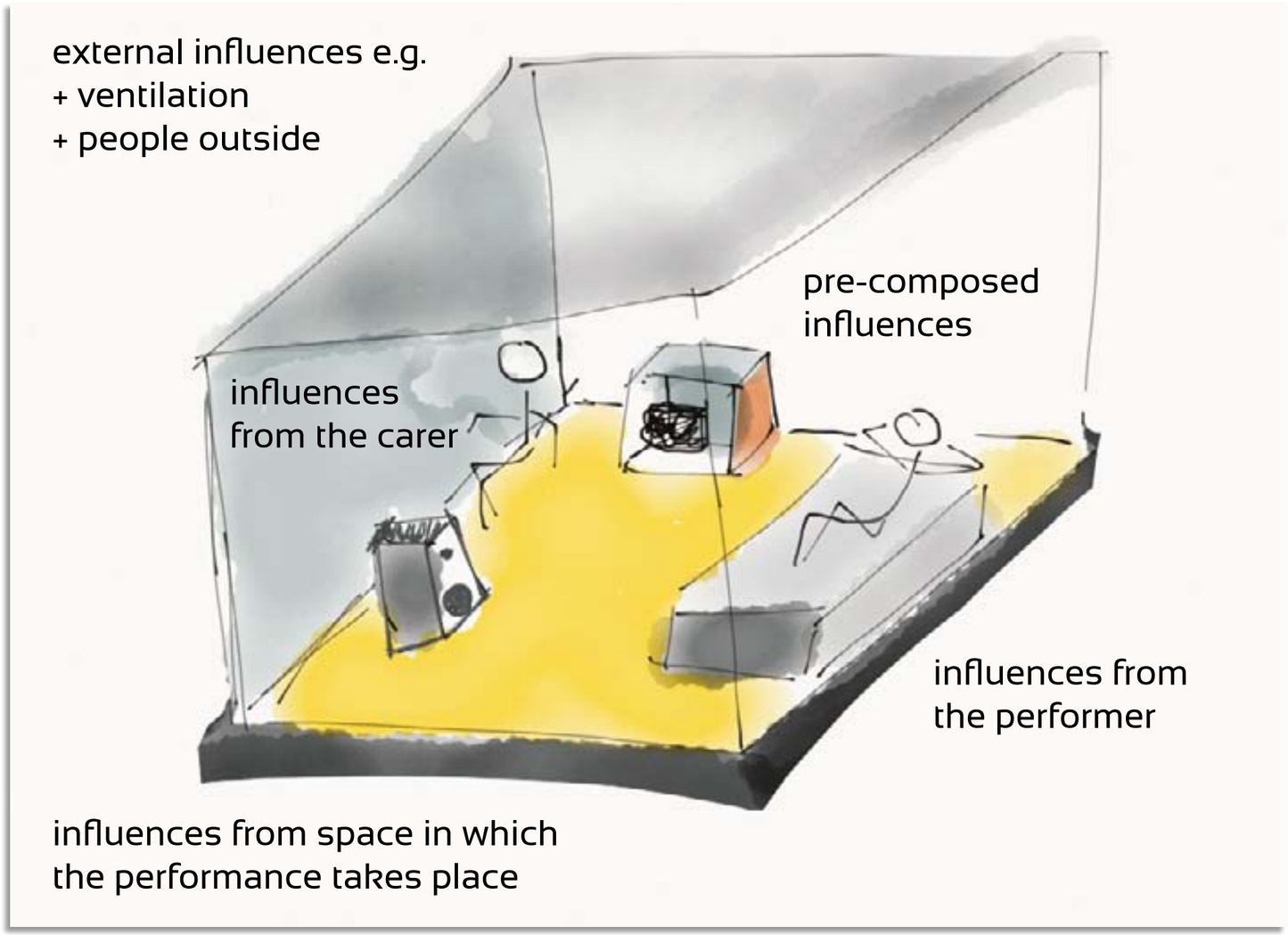
+ joint visit of VillaKarelia in late January
+ 2-day internal workshop
+ design and development of instrument prototypes
+ 5-day field trip (I) listening sessions
+ inspection of gathered material
+ design and development of instrument prototypes
+ 5-day field trip (II) soundscape interventions



design methods



aistihuone – thinking the space



genres – thinking the music

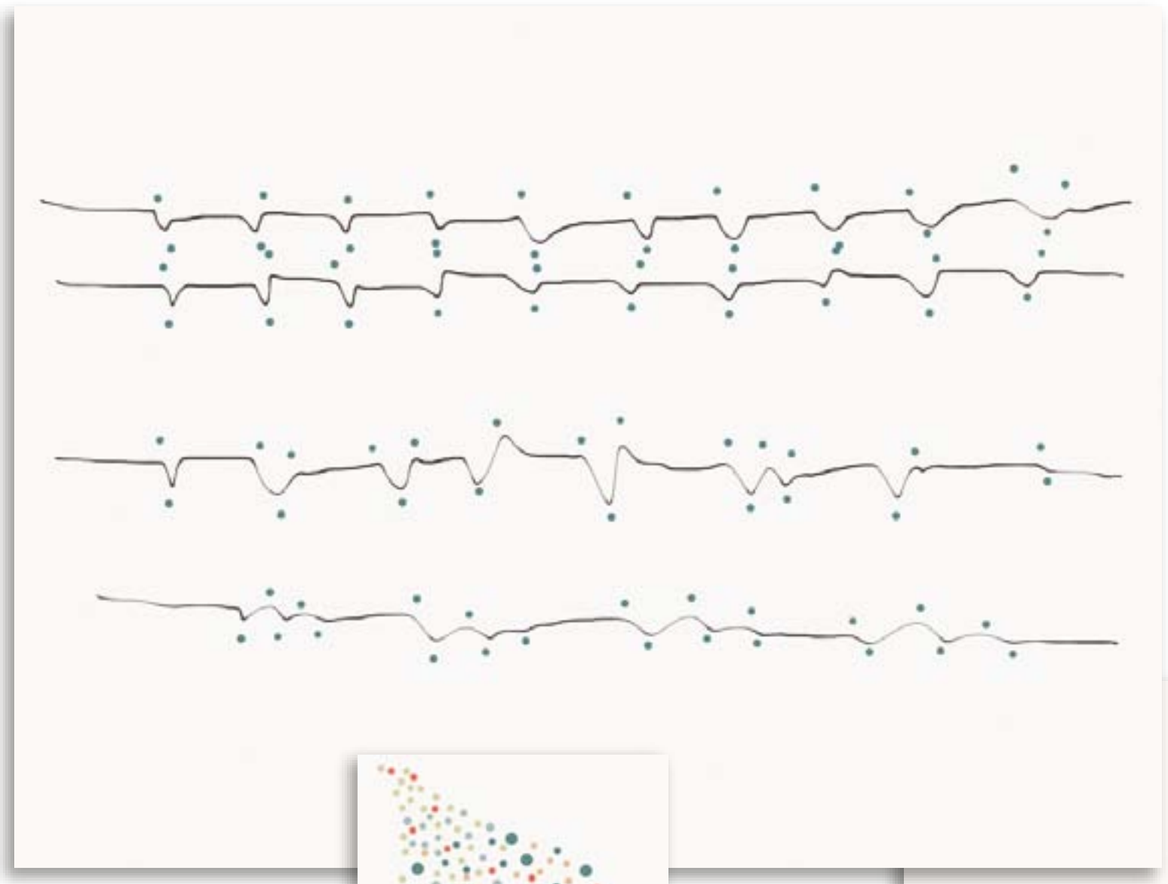
possible genres are listed e.g. by Demers:

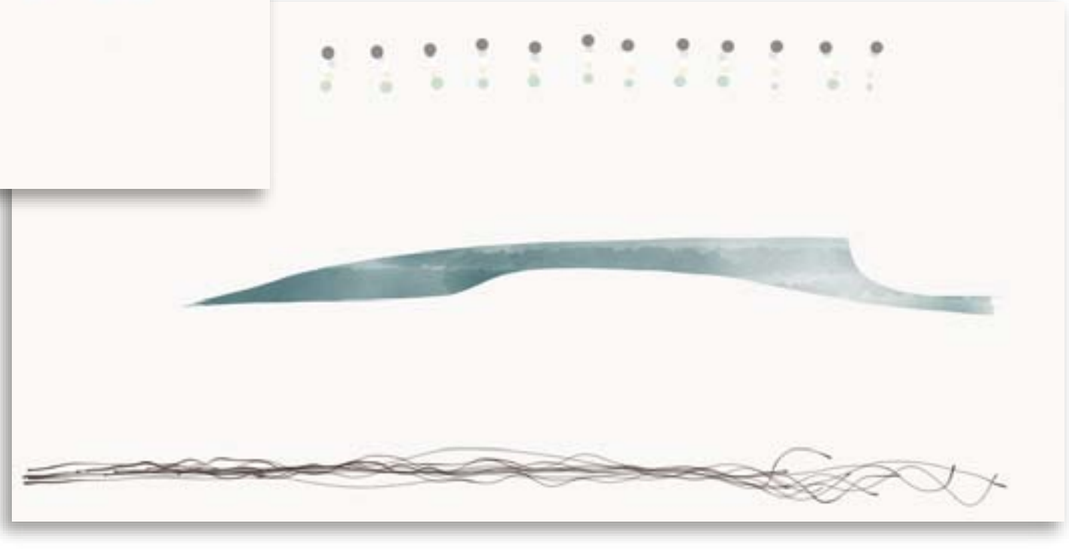
> *I consider a few genres selectively, including musique concrète, post-Schaefferian electroacoustic music, techno, house, microsound, glitch, ambient, drone, dub techno, noise, chill-out, soundscape, and field recording.*
>
> [Demers, 2010]
>
> Listening through the noise: the aesthetics of experimental electronic music

Listening sessions in first iteration included works by

+ Thomas Köner
  ambient noise
+ Signal (Frank Bretschneider, Carsten Nicolai)
  noise/glitch
+ Kangding Ray
  techno/pop
+ Thomas Ankersmit
  noise
+ Wu-Na (暮良文王)
  electroacoustic, gu-seng
+ Steve Reich
  electroacoustic, pattern-based
+ Karlheinz Essl
  electroacoustic, pattern-based

prototyping – score objects





prototyping – example score

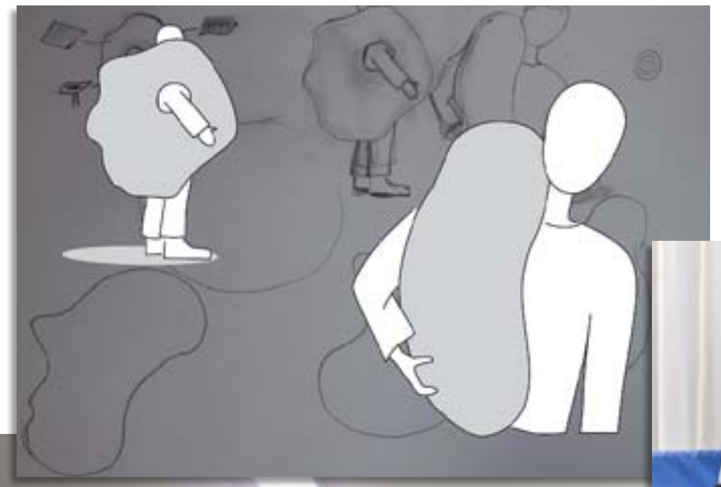
high-pitched rythmical elements
aligned in phase to
rhythms captured from
sensor elements distributed
in the room

granular structures
triggered and modulated
by manipulation of
textile interfaces

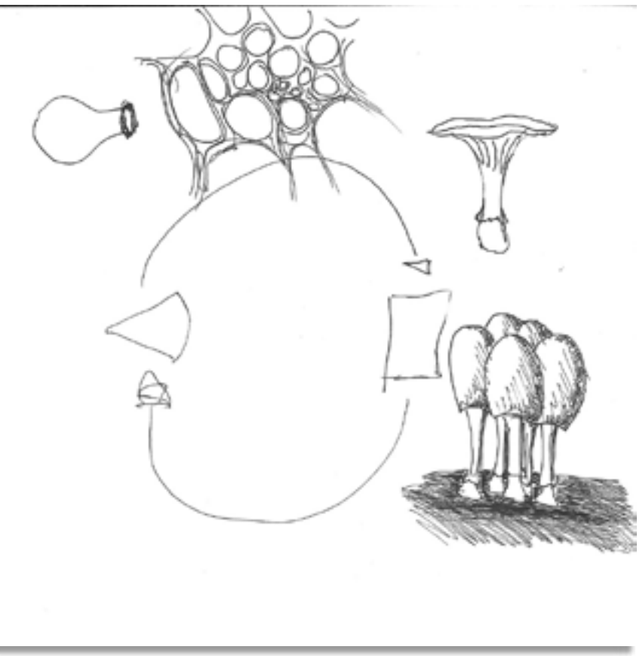
contour/filter settings of
feedback patch determined
by averaged interface
manipulations

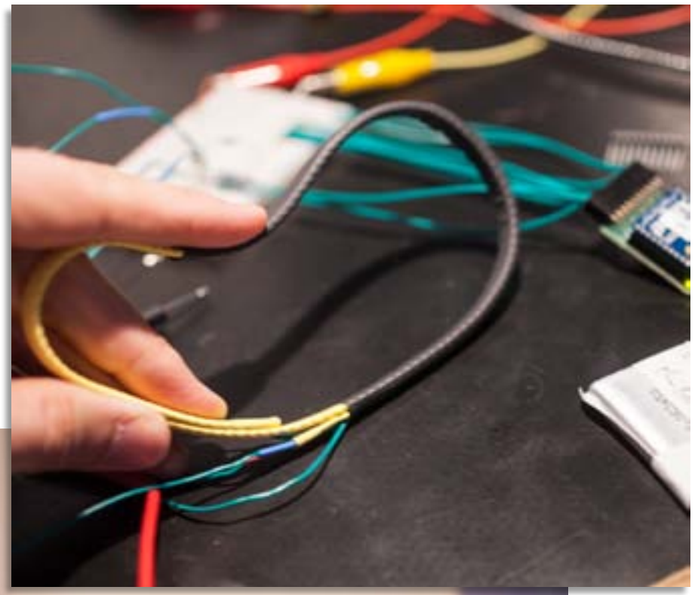
audio feedback
sourced from
ventilation &
room microphones

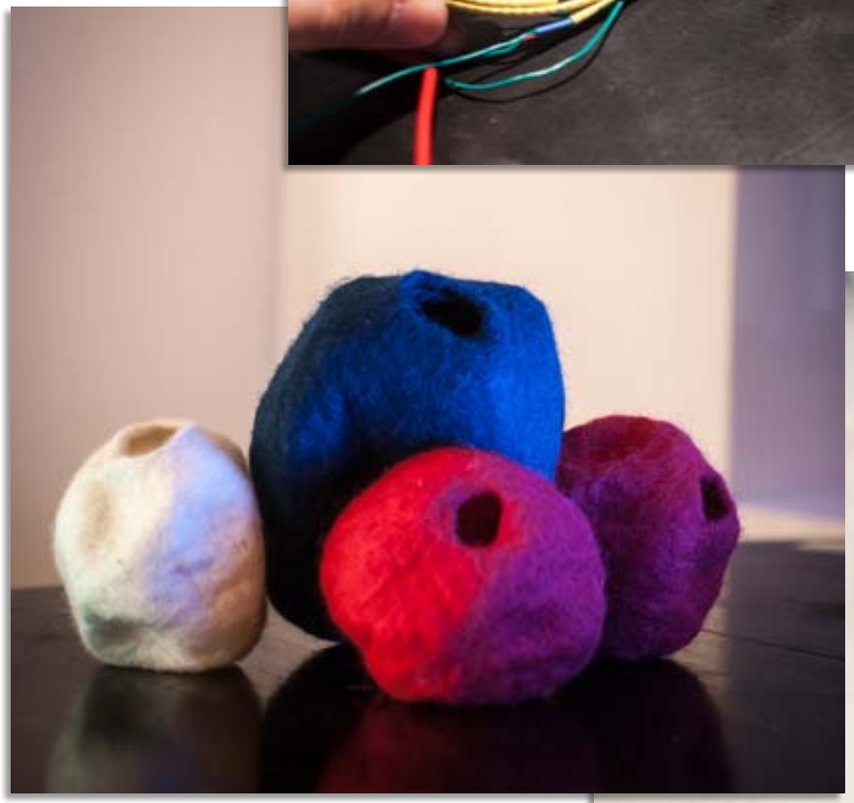
instrument prototypes – first iteration



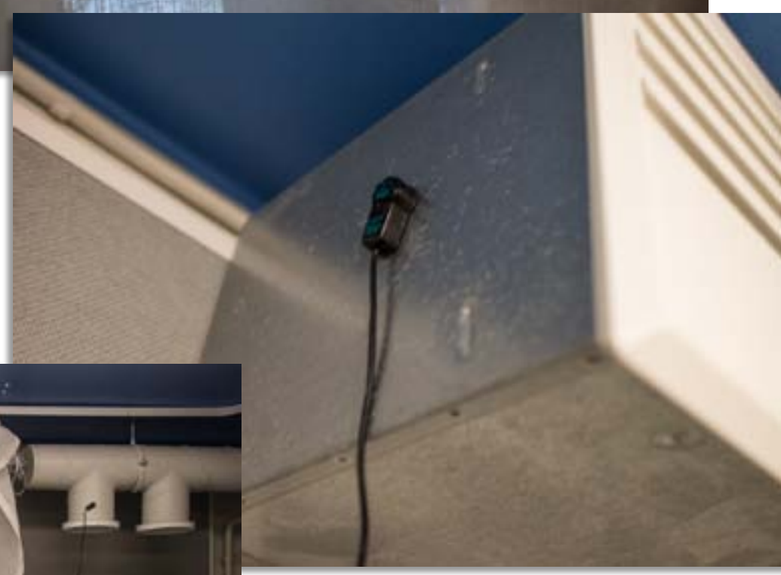
instrument prototypes – second iteration

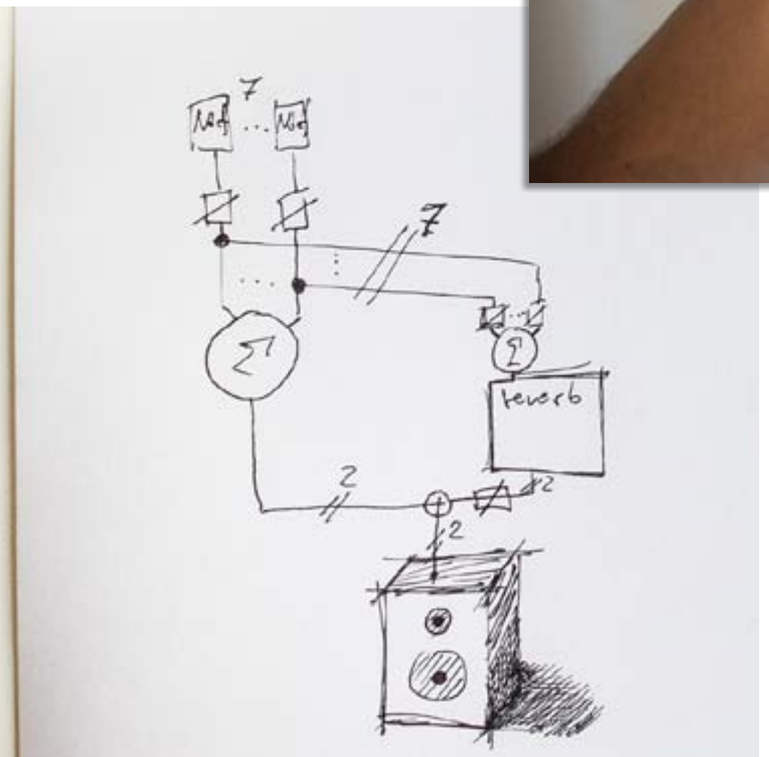




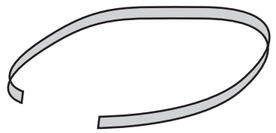


instrument prototypes – second iteration

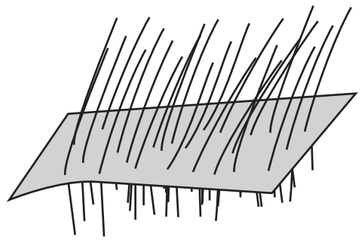




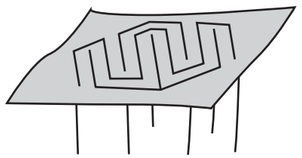
prototyping – sensors



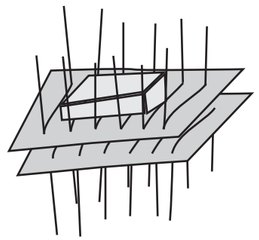
bending



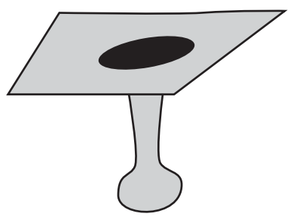
sporadic contact hairs



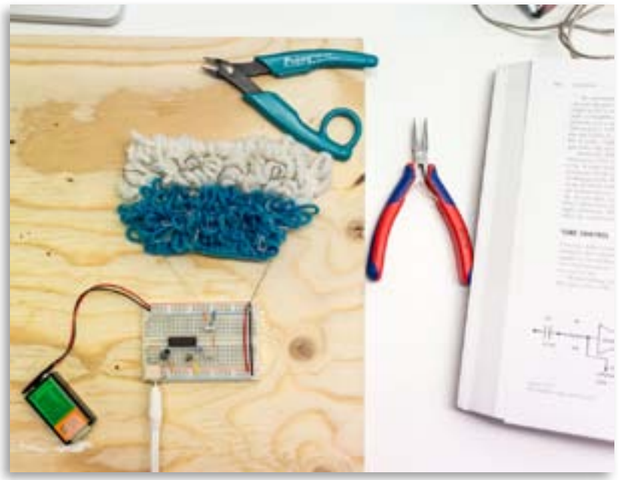
resistive area

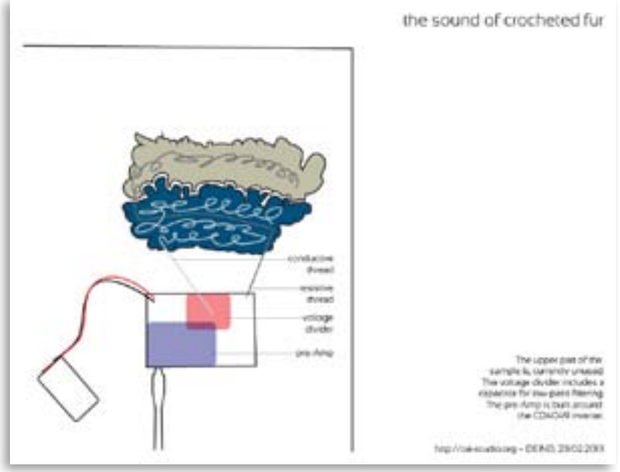


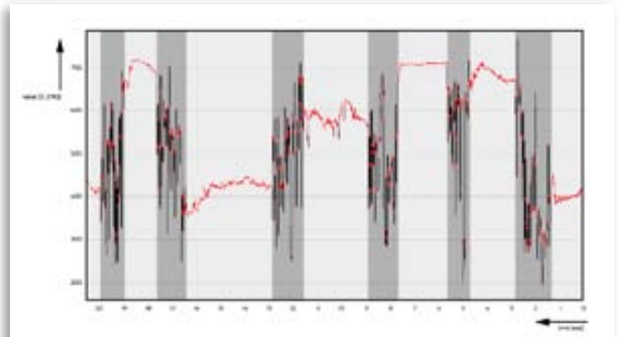
magnetic contact switch



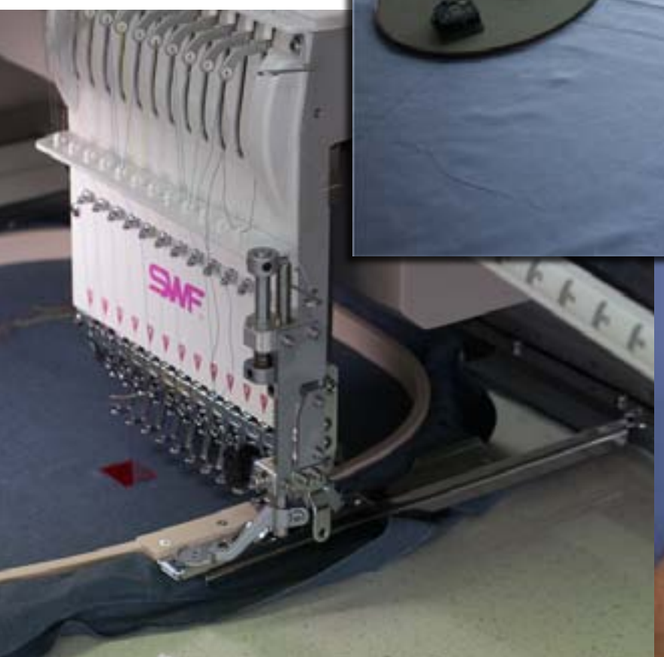
capacitive / pressure hole

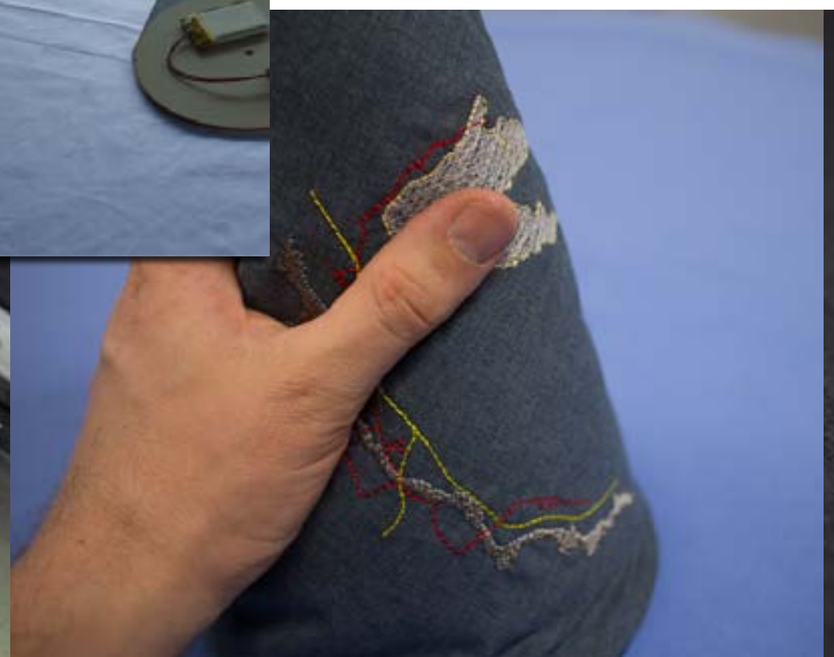




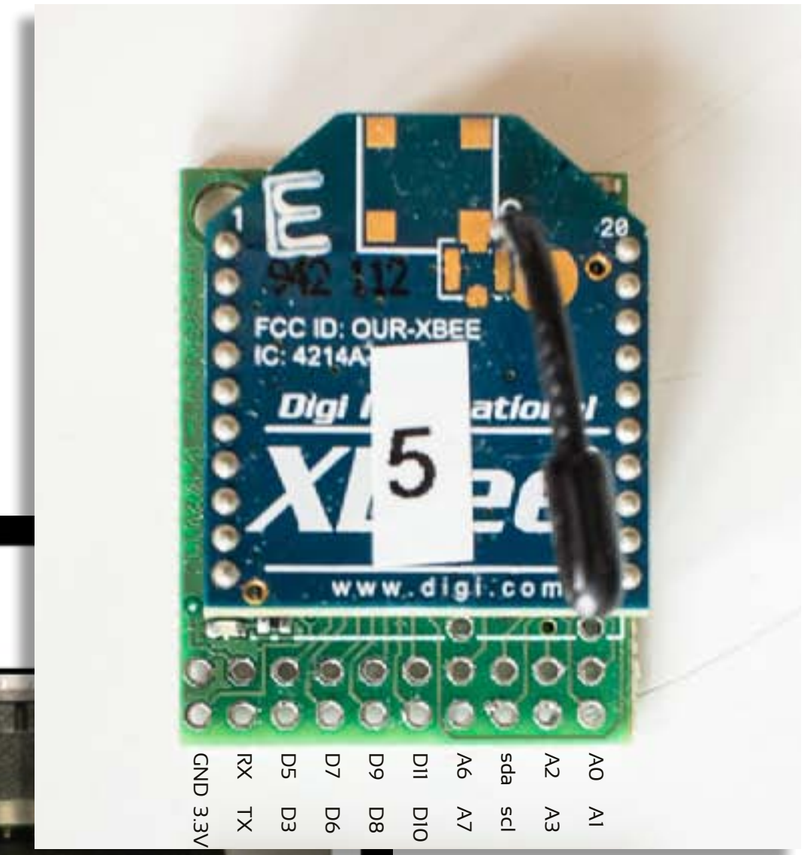


prototyping – e-embroidery



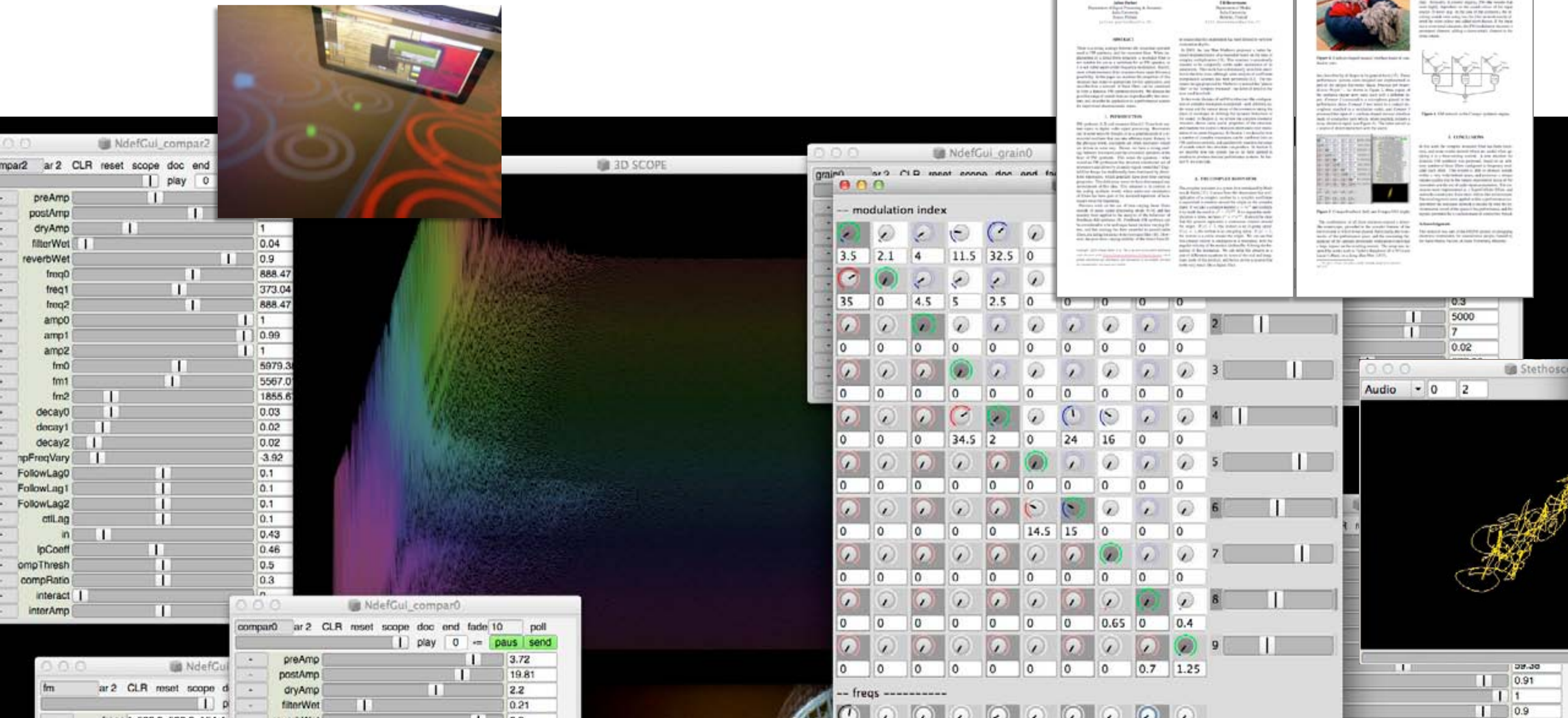


prototyping – electronics



prototyping – audio

complex resonator / ring modulator / FM feedback
matrix / feedback sounds



lessons learned so far

+ we’re dealing with individuals
  every person has her very own way of being. this especially is the case in the context of ASD
+ it is hard to impossible to interpret reactions
  trust in long-term experience of the carers is crucial
+ it is *not* possible to understand the life-worlds of other people
  do not even try to. instead, focus on an inclusionist approach that invites people to join a performance at various levels
+ remove cables
  everything connected to a new artefact has a meaning when presented in a musical context
+ everything takes more time than expected
  getting dressed for a winter walk: 15 minutes. sessions have to take at least one hour to be effective

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