coded

a media dance performance

Frank Blum
blum@frankblum.de

Phuong Nguyen
phuong_nguyen@gmx.net

coded is a cross disciplinary media performance that blends different fields of science to create performing art technologies. This work has been made in collaboration with the GfAI (Society for the Promotion of Applied Computer Science) and the Fraunhofer Institute IZM Berlin. Their support provided us with possibilties in finding different arrays of artistic expression and reflecting on technology.

Duration of performance: 25 min

coded is visualizing sound and performs body triggered composition as well as visual creation. It is implementing the acoustic camera, the wearable neuro T-shirt, the Kinect and the use of the tangible tool of camera tracking, known as Reactivision. The challenge of the performance is to stretch these devices by (re)formulating their different technical needs and aesthetic uses, thus enhancing further development and applicaton of these devices in the fields of sound, visuals and dance.

coded is making use of existing technologies (e.g. acoustic camera, wearable neuro T-shirt) which has been developed for various industries for different purposes.
coded is placing these devices in a performative context to construct an awareness of surveillance and forming new considerations on the relationship of the "public" body and technology. Through the real time response it is visualizing those relationships as dynamic morphologies. Furthermore it is raising questions of how much the bodily world is moving in an algorithmic grid and how much of our actions can be predicted or coded.

coded Part I : Visualisation of sound, Acoustic camera

coded looks at medieval music in relation to electronic music.
Medieval music in former times was amplified by the architecture of the church. In this work the multi-layered soundscapes of medieval music will be visualized to enable the sound to create its own architecture.The composition consists of an interplay of live medieval music and electronic music, triggered by the dancer's movements.
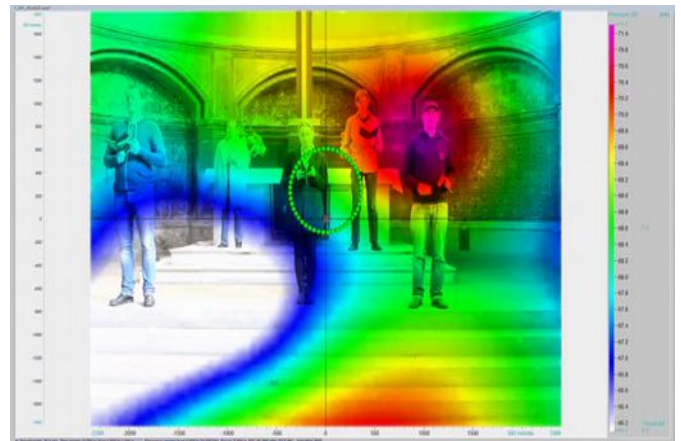
coded implicate the use of the acoustic camera in a performative context.

Vox Nostra Ensemble perform their medieval repertoire; their singing will be captured by the acoustic camera. The sound of the singers will be visualized, creating 3D environments on stage, as the detected sound will be shown on a screen seen through 3D glasses.

The variety of sound modulation through the singers can be seen as „clouds" in different colours as the fading in and out and the intensity of the voices become visual. The „sound clouds" appear to hang in the air, overlapping with each other, creating an ephemeral environment.

http://www.vox-nostra.de

coded Part II: Body triggered sounds and visuals
Kinect, wearable neuro T-shirt, Reactivision

Interactivity comes into play in a time of passiveness. Virtual technology has been personalized and humanized, it gives us an imagined omnipotence in an imagined community. Software devices promising competence in their field of ready mades. It is creating belief systems where it conveys that we are gaining competence, but we are only playing under the realm of their rules. The extension of illusions has formed our daily life and has created a "grey zone" of the virtual and the real. This "grey zone" provides a place for creation. "Coded" enters the world of video games by using the kinect sensor, a supply for the xbox video game console and transforming it into the realm of the stage. In the bodily world, software failures occur. The dancer's body being schemed by the kinect sensor, she will create and change her environment through movement.

She is catching, altering words and forming sentences. She is dancing with her self created avatar, that will out-number herself during the performance. She will be faced with her imagined self and her multiplicities of herself.

coded seeks to create an environment of intimacy between performer and spectators. The audience's faces will be captured and implanted in the realm of the virtual performer. Audience and performer are sharing the stage scenario and producing in collaboration. The consumer becomes the producer.
The kinect sensor will record the performer's sequence and transform it into the next sequence.The performer will interact with her previous movement sequence and the same time creating the basis for the future sequence. Through the implantation of the past movement, it touches the body in the present, where the alteration in a sense produces the future anew. Furthermore, the movements control the sound. The musical score will be played by the performer's movements. Choreography and composition are triggering eachother. The performing body also consistently trying to cope with the failures of software tracking and therefore pending between the controlled and uncontrolled state.

As the body has been a source of measurement from the beginning of human kind (eg. 10 feet high....etc), a quantitative and spatial mode of forming a relationship to our body has determined how each thing we observe stands in relation to our own being. The tracing image of the body's movement is the score that results out of it.

coded performs an electronic composition, triggered by the dancer's movements.
The fiducial markers, placed on her body, enable the possibility of producing image.
The use of the Kinect offers a way of composing and creating sounds.
The rhythmic "beat" for this composition is the dancer's own heartbeat as it is sensored by a wearable T-shirt, developed by the Fraunhofer Institute IZM Berlin.
The medical datas supplied by the sensored T-shirt will influence the outcome of the composition.The changing heart frequence during the performance, creates an inside and outside relationship.

Technical descriptions:

Wearable sensor integrated T-shirt

The wearable sensor integrated T-shirt has been developed by Fraunhofer Institute Berlin IZM in order to survey patients' physical datas in real time and to transfer medical informations to their doctors, e.g. blood pressure, blood oxygene, heart frequence, ECG (Electrocardiogram), EMG (Electromyography), body temperature, puls etc...)
The constant medical surveillance offers the opportunity for medical centers to react instantly in case of emergency.

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Acoustic camera

Source from the GfAI website:

The Acoustic Camera was the first commercially viable system using beamforming to visually localize acoustic emissions. Brought to the market in 2001 as a pioneer technique, the Acoustic Camera has become over the years a metaphor for beamforming systems in general. The tool is now used in a variety of industries and has a growing customer base worldwide.
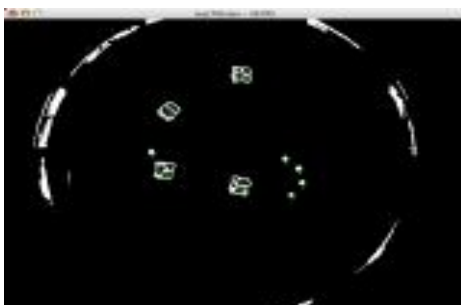
The advantage of the Acoustic Camera: it is a light-weight, modular and therefore flexible system which is rapidly set up and ready to use. After a few minutes only, you get the first acoustic images on your computer screen. The software allows a clear, exact and fast analysis of noise sources.   The fields of application are as various as the world of sound and range from measurements in the open field, acoustic labs to the use in automation engineering.   The benefits of the Acoustic Camera are straightforward: Noise sources are visualized, quality problems are detected and development times are reduced.
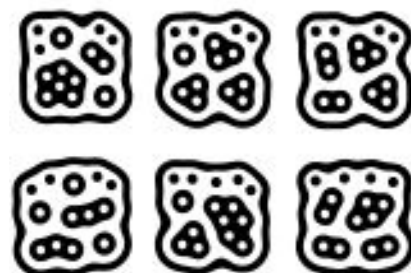
ReacTIVision

Source from reacTIVsion website: http://reactivision.sourceforge.net/

A toolkit for tangible multi-touch surfaces

reacTIVision is an open source, cross-platform computer vision framework for the fast and robust tracking of fiducial markers attached onto physical objects, as well as for multi-touch finger tracking. It was mainly designed as a toolkit for the rapid development of table-based tangible user interfaces (TUI) and multi-touch interactive surfaces.

reacTIVision screenshot   fiducial markers example

Software & Technical settings:

vdmx: a software based, media processing environment
quartzcomposer: node-based visual programming language for apple computers
java: transform OSC messages readable for quartzcomposer
NI-Mate: a tracking software for kinect that sends OSC messages via UDP
osculator: a software that translates OSC messages in midinotes
ableton: music software

The dancer's movement will be tracked by the Kinect and will be send to NI-Mate.
NI-Mate transforms the different movement patterns into OSC commands.
These commands will be transferred to Quartzcomposer and Ableton.
The OSC-messages will be used in Quartzcomposer in order to create an avatar
and to animate graphical patterns. The music will be controlled by virtual synthesizers
in Ableton, which trigger different parameters, e.g. filters, cut-offs, volume..etc.

The various datas supplied by the acoustic camera, e.g. frequency, volume and
coordination in the room, will be processed in Quartzcomposer to create 3D
animation.
Two video beamers with polarized filters project the 3D animation onto a metalized
screen. The 3D animation appear as floating in the air, seeing through 3D glasses by
the audience. Vdmx will be used to transfer different visualizations to the beamers.

Technical Requirements:

2 Videobeamer
Metalized screen
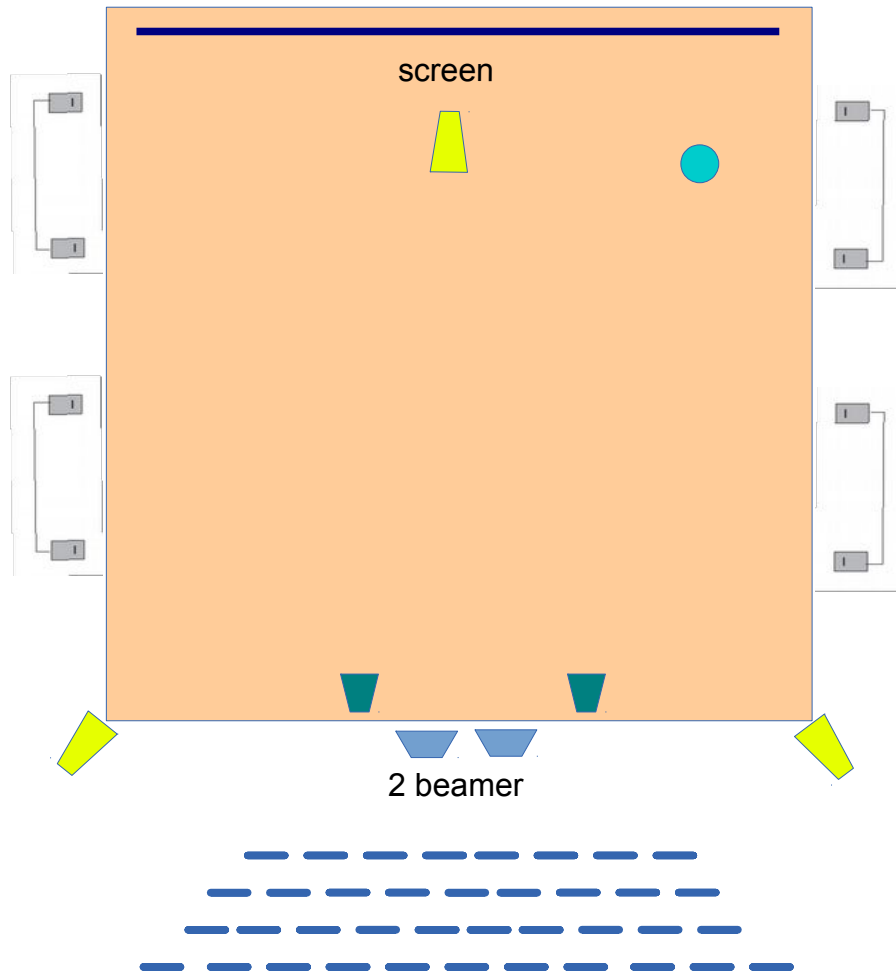3D glasses for the audience

Soundsystem
Audio Mixer Console
Video Mixer Console
Light Mixer Console

coded
Technical Settings

screen

2 beamer

8 spots , 1 light mixing board

2 video beamer min. 3000 ANSI Lumen, depending on space,
Projectors should be installed from above

3 cameras for tracking

2 Kinect tracking cameras

Acoustic camera

metalized screen for 3D-projection

chairs can be loosely spread out, if the stage has a fixed tribune,
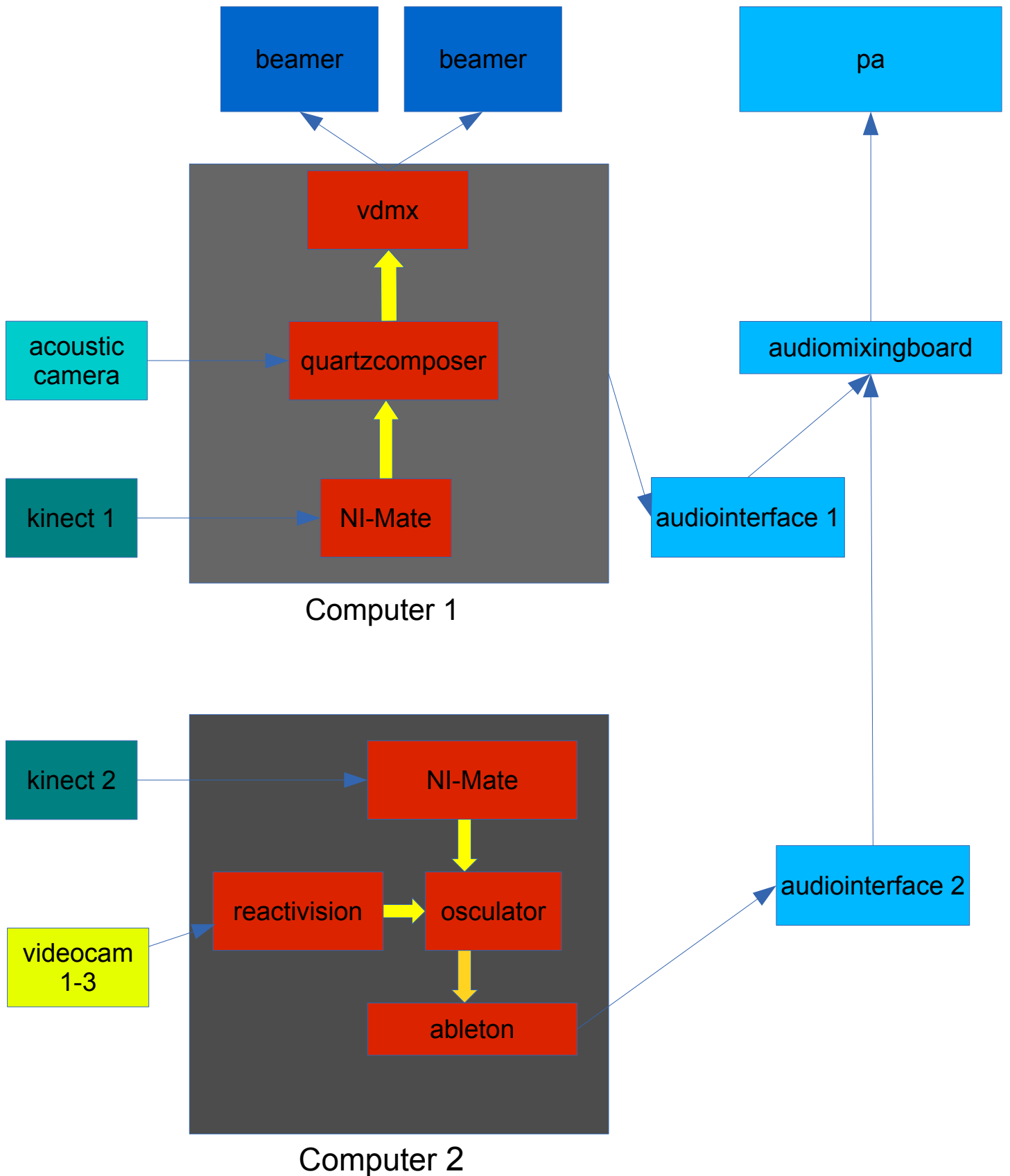we adapt

Stage: The performance space should be a minimum of 10m x 6m,
              floor: iif the floor is not smooth, black dance floor

Sound: PA system for the audience, 1 audio mixing board
              with 8 channels

These requirements are meant to be adapted to the specifies of each space,
 we are happy to receive plans and pictures of the space in order to set up an
 appropriate version.

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Technical Workflow

beamer

beamer

pa

vdmx

quartzcomposer

acoustic camera

kinect 1

NI-Mate

Computer 1

audiomixingboard

audiointerface 1

kinect 2

NI-Mate

reactivision

osculator

videocam 1-3

ableton

audiointerface 2

Computer 2

Artistic statement, Phuong Nguyen: *"For me as a choreographer/performer, I am interested in the relationship of the body in constructed systems and how real-time input influences the performative outcome. The process of working with these devices has developed a notion of body knowledge as multiple and parallel awareness is needed. One of the challenges is how to work in the constraints of technological settings and to find new ways of performance making as well as defining a vocabulary of movement material."*

Phuong Nguyen is an interdisciplinary performance artist based in Berlin. She studied dance in Berlin and at the Fonty's Dance Academy in Tilburg (NL) and attended the ' Contemporary Arts Course ' at Deakin University in Melbourne / Australia, where she started to move into the fields of performance and film. Much of her interest lies in reflecting upon human conditions and seeing art as a platform for consideration and expression. Her work is also concerned with relationships operating between corporeality and incorporeality and the various modes of the body's actions within technological environments.
Central to this mode of working comes through how technology and editing devices shape the process of art production. Phuong Nguyen has produced several film-, performance- and installation works which has been shown and exhibited in a number of festivals and galleries: The Videodance Festival in Athens, Thessaloniki, 291 Gallery London, pact-zollverein in Essen, Danceflicks – 'Danceflicks' at Dancehouse, Melbourne, 'd.a.m.p.f.' International dance and performance art festival, Cologne, Dance Moments at Bunkier Sztuki, Tanz NRW Festival- Dance Experimental Film, MNM project (as choreographer) Ars Electronica 2012 and others.

Artistic statement, *Frank Blum:* *" Working in the fields of science and art, my focus was to create a platform where scientific research and artistic expression informs and challenges each other.The interdisciplinary research in the different fields of science has created a vivid exchange and considerations on existing devices as well as raising new research questions."*

Frank Blum works since the 90´s at the interface between science and art. Scientific curiosity and the desire to experiment are always the decisive impulse to deal with new theories and discoveries of science and in cooperation with research institutions like the Max-Planck Institute or German Heart Center to interpret them artistically.
After his studies in photodesign, sociology and film, he works as a director, camera and editor for different music and tv productions (e.g. „pick-up" and "rough mix").His short films, installations and sculptures has been exhibited at Kunstwerke (Berlin), Postfuhramt (Berlin), Kampnagel (Hamburg), Max Planck institute (Halle) and other renowned galleries, festivals and institutions. In that time he has involved himself in designing for film sets and interior designs of Club's (e.g. E-werk, Casino, Polar TV).
From the year 2001 he has released several electronic music tracks and performing in Live-Acts.
In 2004 he worked with Klaus Emmerich. 2005 he was responsible for camera and music on the filmproduction "Hol sie der Teufel". 2007 he has founded Studio Blum, where he is responsible for direction, camera and editing.

Coded participants:

Direction & Concept:	Phuong Nguyen and Frank Blum
Technic & Music:	Frank Blum
Dance & Choreography:	Phuong Nguyen
Music Direction:	Burkard Wehner (Vox Nostra)
Photography & Documentation:	Elena Karakitsou
Software:	GfAI (Society for the Promotion of Applied Computer Science)
	Fraunhofer Institute IZM Berlin