

Workshop « **Movement qualities and physical models visualizations** », organized by the Ircam-Centre Pompidou and LIMSI-CNRS, March 1st and 2nd, 2012.

Contribution by Jean-Marc Matos www.k-danse.net

I like the idea of the participation to this workshop from the point of view of the artistic team describing creative experiences informed by these very interesting questions about movement qualities and physical models visualizations.

This contribution deals with the presentation of a recent art work created by the dance company K. Danse, **Echo Room**, where whole body interaction is essential.

On one hand the capturing of movement data is coming from physiological sensors intending to measure qualitative states of the expressive body and on the other hand graphic and sonic visualizations of these bodily states have been designed and experienced in order to put forward the enhanced perception of qualities of movement through a preliminary concept of “physical” and abstract visualization. The main question for us was “how to transcribe as faithfully as possible minimal and subtle variations of choreographed emotional states”.

Echo Room is an interactive dance performance. It questions the domination of the other and the structure of relationships between men and women. The choreography draws on the dialectics of the body which is inherited and socially constructed on the one hand, and lived and free to make choices on the other. The uncontrollable is juxtaposed with the controlled and imposes itself like an echo of the past.

Echo Room deals with the simultaneous perception of various states of one given reality embodied in a man-woman relationship through the use of physiological sensors. It questions the relationship between movement, physiology and psychological structures through a danced duo to be experienced by the audience in three visual and sound spaces (stage version or site specific version) where they can freely look at and listen to.

Each space emphasizes either the live dance; the physiological reactions-interactions of the dancers through sound, shape and color; or the mental space of the dancers through reactive sound and video. This is achieved by treating information collected by sensors attached to the dancers which measure some of their physiological reactions: muscular tension, breathing, and heartbeat, allowing for another real-symbolic-past-future space/time interpretation of the dance that we see unfolding before us. A deeper perception of the relationship unfolding before us leaves us with a deeper perception of our own relationships.

Physiological reactions of the dancers (muscular tension, breathing, and heartbeat) are measured with wireless sensors. The body states of the dancers determine these reactions and their minute variations. In turn the captured data is translated into images and music. In the first adjacent space, i.e. the “physiological” one, a certain level of abstraction and minimalism of both the music and the images (pulsation, vibration, etc. of colours) create a reactive and immersive environment for the perception of the body states of the distant dancers. In the second space, the “imaginary” one, a cinematographic approach is set to enhance the perception of the real and symbolic elements at work within the relationship. These simultaneous images and sounds give the audience a different perception of the danced movements and the relationship which unfolds in front of their eyes.

Echo Room: technical description

General Set-up:

Stage version: three separate visual spaces around the stage or around a central performance area

Site specific version: three separate spaces (rooms) and free circulation for the audience

Two dancers equipped with physiological sensors.

The audience can freely look at and/or listen to these three spaces.

Duration: 50 mn (long version) – 20 mn (short version)

- A space for the live dance, unfolding before the audience
- A second visual and sound space where abstract video light and sound fluctuate, in real time, according to the physiological states of the dancers
- A third visual and sound space where the physiological states produced through the choreographic writing are translated into images and sounds of the dancers perceived in another real-symbolic-past-future space/time dimension (cinematographic images)

Stage version: the audience can be positioned either frontally or on the stage itself so that they can have three different points of view. Images and sounds are projected on the stage and on the walls of the house. The dance takes place on the stage.

Art gallery version: the audience is positioned all around the central performance area where the dance takes place. The other visual and sound spaces are installed in different adjacent rooms still visible from the central area. The audience can either stay in place and freely look from different points of view or circulate in the different rooms.

Site specific version: a given space is divided into three rooms. One room is dedicated to the live dance, a second room is the “physiological” room, a third one is the “psychological” room. The audience can freely circulate in between the three rooms.

The technology:

Physiological capture of movement ->

The two dancers are equipped with wireless physiological sensors. These sensors, adapted from medical equipment, measure their physiological reactions: muscular tension (electromyogram), breathing (nose breathing sensor), and heartbeat (electrocardiogram). The massive amount of information coming from these sensors is first filtered and the data delivered is treated to make it adaptable to the artistic project.

Some very specific software is designed to translate that raw data into readable data for image and sound treatment.

The sensors have been designed by the young Biogène company <http://biogene.fr>

Two emitters with their set of sensors and one receiver, wireless transmission is made possible through a 2,4 GHz Zigbee protocol. The driver of the Zigbee is written in python. This one redirects the data in UDP towards the network. Data is treated with the Labview (NI) software.

Digital mapping, control interfaces and treatment of image and sound ->

The digital treatment of image and sound is a shared architecture of software which encompasses the production of images and sounds for the three spaces, simultaneously. Some of the music (sounds produced in real time), the video light, the “organic” fluctuation of the image and some special video treatments are generated in real time through the physiological activity of the dancers. Other images and music are pre-recorded original material.

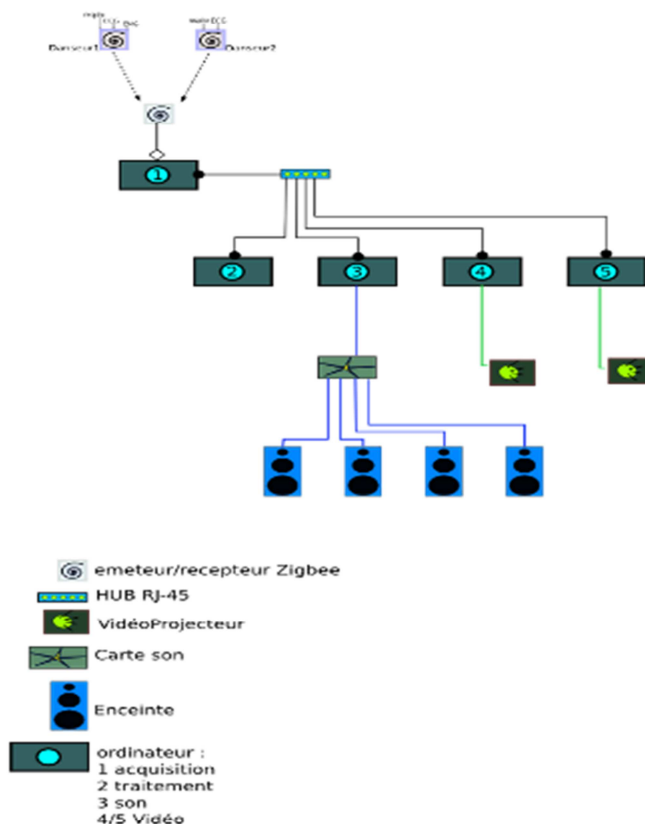
Mapping of captured data for the control of projected images and sounds

Specific mapping modules are designed to transmit, organise the routing of data (OSC protocol for the transmission through an ethernet network for the images and MIDI protocol for the music) coming from the physiological sensors (in quantity and/or quality) and translate it into parameters (switching, triggering, real time generation or treatment of the different visual and sound media). The interface is written with Pure Data and Jamoma (software platform under development).

Digital network for the three visual and sound spaces ->

In each space (room) there is a specific set up for the projection of images and sound. The entire system is an ethernet network set to transmit data coming from the dancers through the physiological sensors attached to them and to finally control the video projectors and loudspeakers in each room.

Technical diagram:



Echo Room

Contemporary dance performance with interactive installation

Three different simultaneous perceptions of a dance duet

Two dancers equipped with physiological sensors measuring muscular tension, breathing, and heartbeat

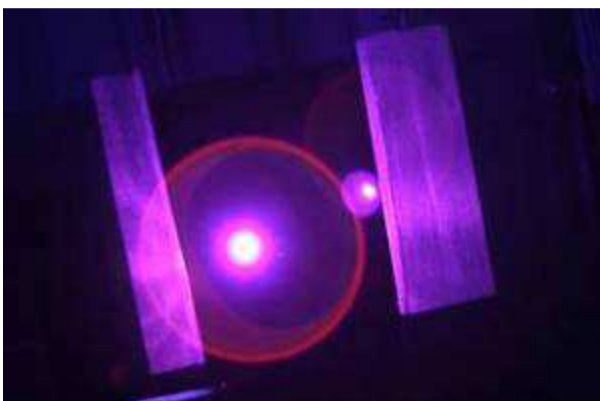
Three separate visual and musical spaces in one location:

A space for the live dance

A space for the physiological states of the dancers translated into sound and video light

A space where the real-symbolic-past-future space/time dimension of the dancers' psychology are displayed via sound and images

Duration: 50 mn



<http://www.k-danse.net/en/echoroom>

Echo Room: team

Dancers

Benjamin-Aliot Pagès (half Japanese-half French), Yuko Yamada (Japanese)

Music composer

David Fieffé (French)

Video artist

Guillaume Bautista (French)

Sensors engineering

Julien Marro-Dauzat (French)

Computer programming

Théo de Lahogue (French)

Concept

Anne Holst (Danish)

Artistic and choreographic directorship

Anne Holst, Jean-Marc Matos (half American-half French)

Echo Room: partners

Partners and co producers:

Multimedia Cultural Center Bellegarde, Toulouse

Digital Art Center Le Cube, Issy Les Moulineaux

IDN Festival, Barcelona

« Art-Science » residency and exhibition Center, Labège (near Toulouse)

Theatre Marcel Pagnol, Villeneuve-Tolosane

Art-Science « la Novela » Festival, City of Toulouse

CorpusMedia « Digital stage » euro regional project (Catalonya, Midi-Pyrénées, Languedoc-Roussillon)

National Center « des Ecritures du Spectacle », La Chartreuse de Villeneuve-lès-Avignon (near Avignon)

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DICRéAM, National Centre for Cinema

City of de Toulouse

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General Council of the Haute-Garonne