



Project funded by the **EUROPEAN UNION**



International Augmented Med
Multimedia and interactive technologies for the promotion of cultural and natural heritage

Italy * Egypt * Jordan * Lebanon * Palestine * Spain * Tunisia

1° Workshop : Architectural Video Mapping & Interaction Design
Bibliotheca Alexandrina, Alexandria, Egypt
June 3-6, 2013

Teachers:
Anna Monteverdi - Rosa Sanchez - Alain Baumann - Enzo Gentile

BIBLIOTHECA ALEXANDRINA

مكتبة الإسكندرية

Coordinator: Yasser Aref, Ph.D. Arch

Generative Art
Augmented Reality
kinect
Architectural Mapping
Interaction Design
processing midi
Motion Tracking
videomapping
faceTracking
vuvv
OSC
Resolution

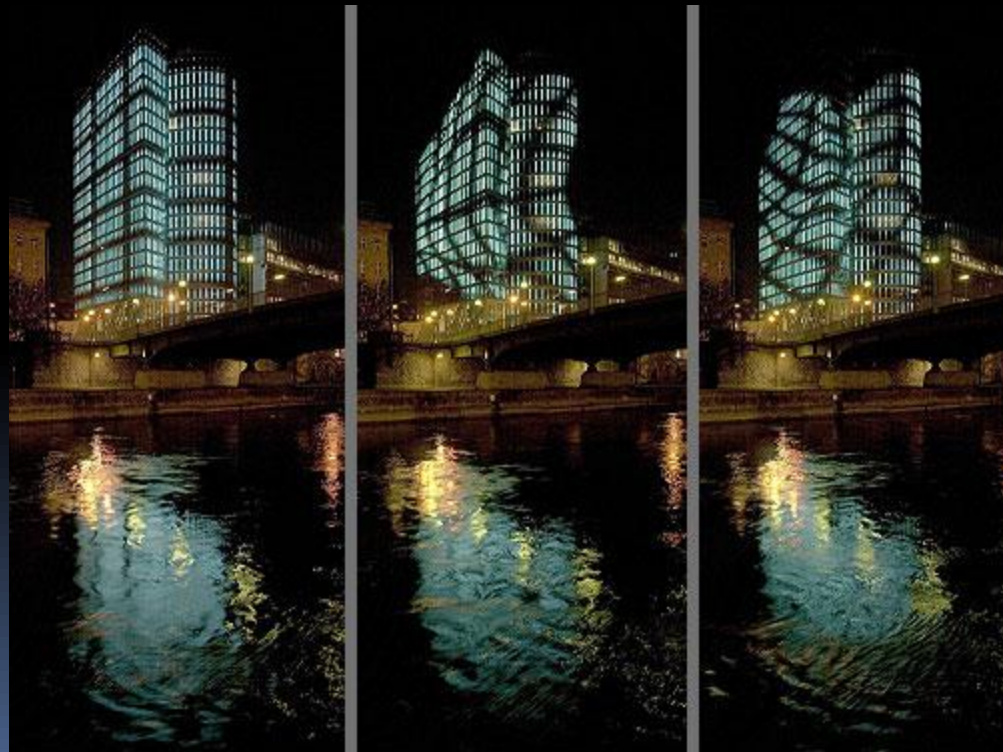


EGYPT



graphic design by enzo gentile

Architectural Video mapping:









1/2/3 JULY 2011
KERNEL FESTIVAL
at Villa Tittoni Traversi
Desio, Italy



Klaus Obermaier Dancing house



URBAN SCREENS





**SHREK
THE MUSICAL**

**my
boys**

**THE
BEGINNING
IS NEAR**
JUNE 2

**THE
SIBYRIAN**

RAMP

**THE
MUSIC
MAN**

JERSEY BOYS
The Story of Frankie Valli & The Four Seasons
AUGUST WILSON THEATRE, 245 West 12th Street

LET THE SUN SHINE
HAIR

So MUCH HAPPENED BEFORE DOROTHY DROPPED IN
WICKED
A New Musical
The Untold Story of the Witches of Oz

Tonight belongs to...
PHANTOM

**ROCK
OF
AGES**
A NEW MUSICAL

POINTOLIVE
NYC GIFTS & MORE

**TAU'S
STEAKS**

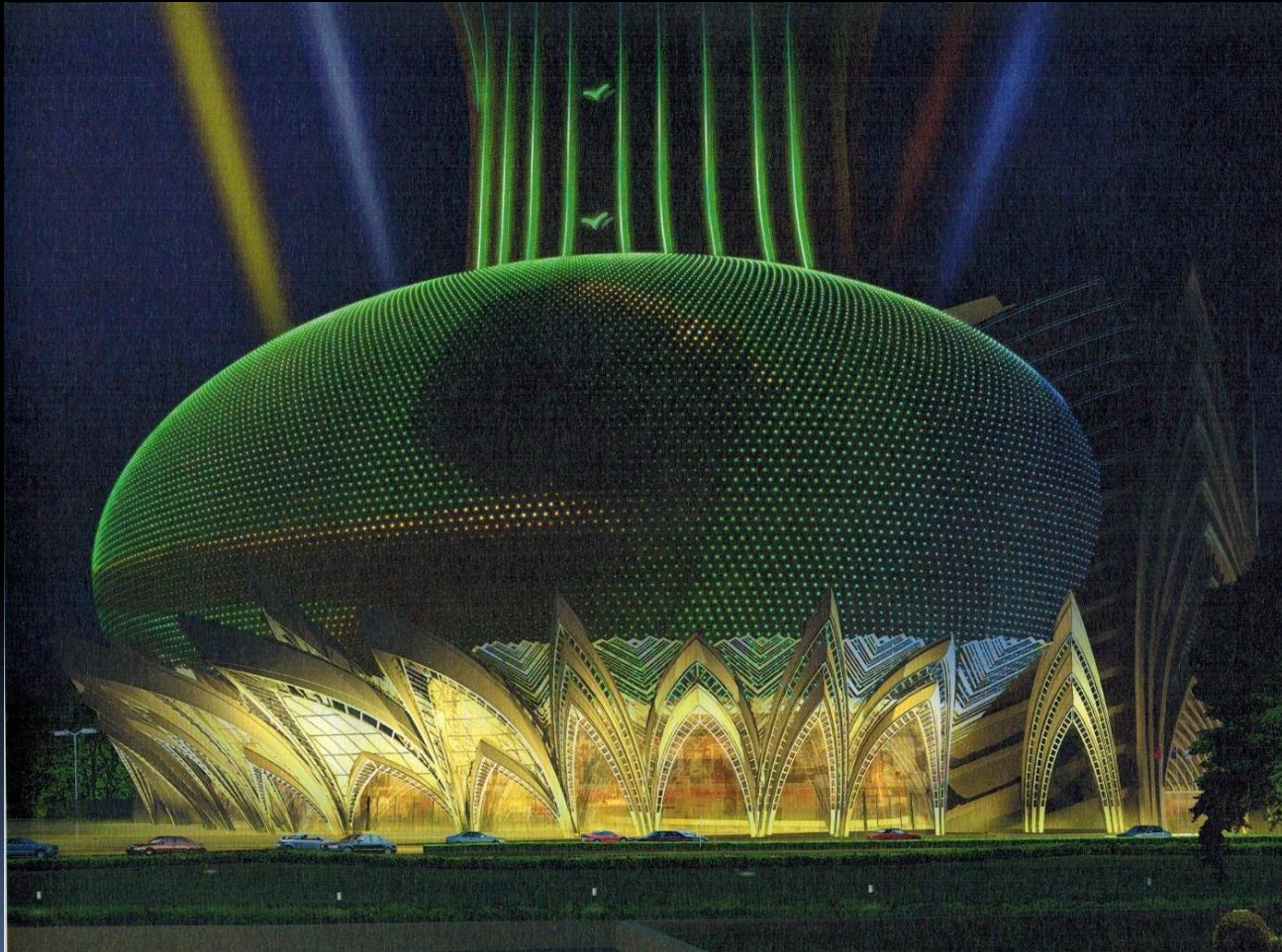
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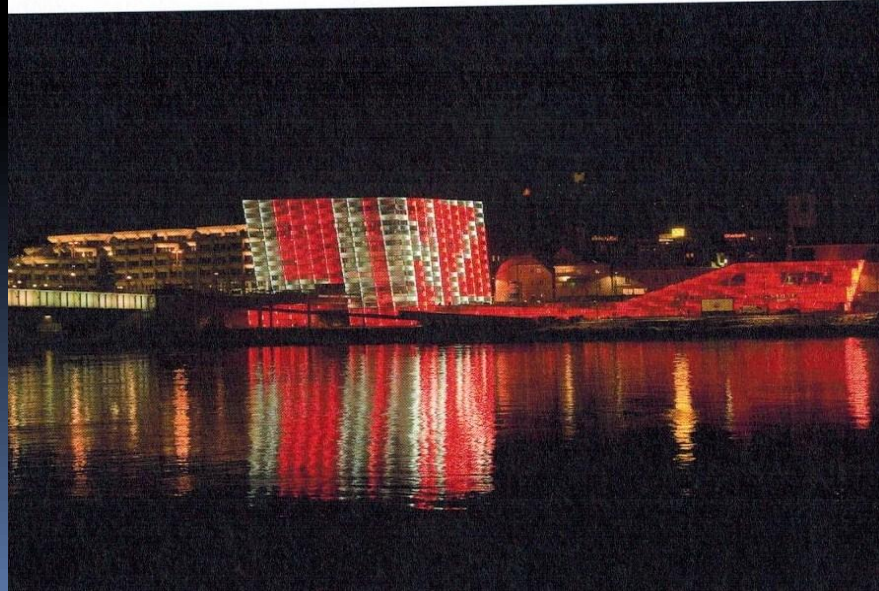
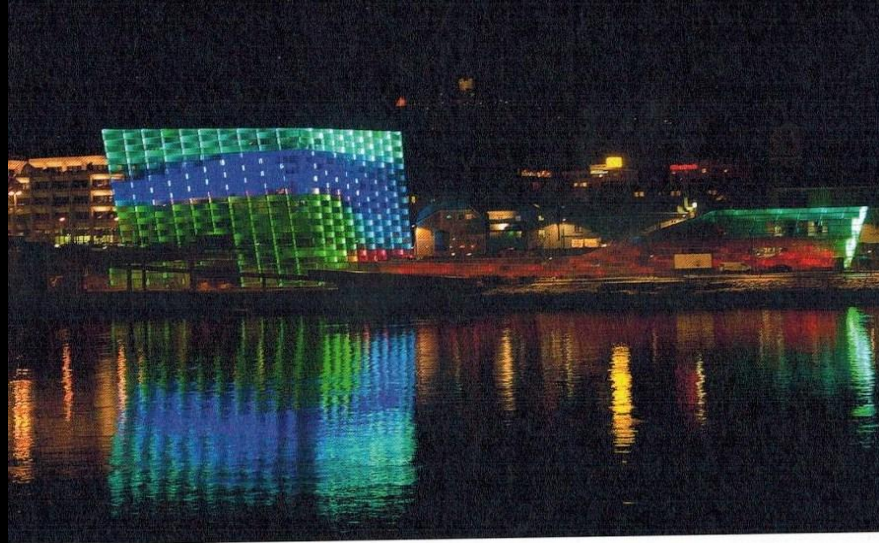
Grand Lisboa (Macau)



Grand Lisboa, MACAU (Asia)



LINZ (Wien)-ARS ELECTRONICA

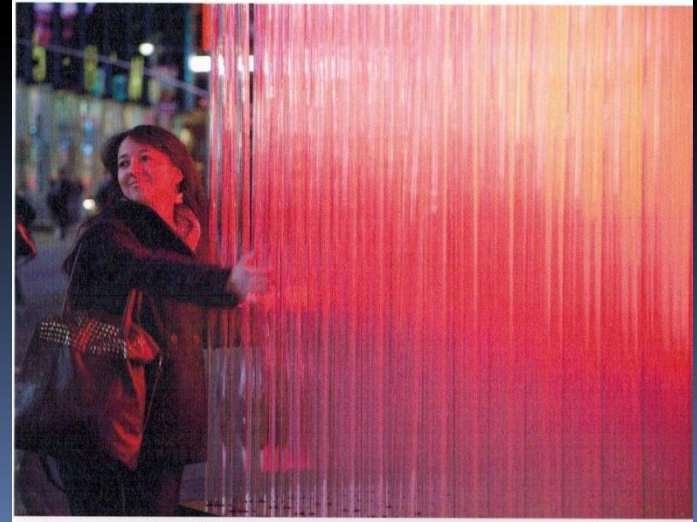
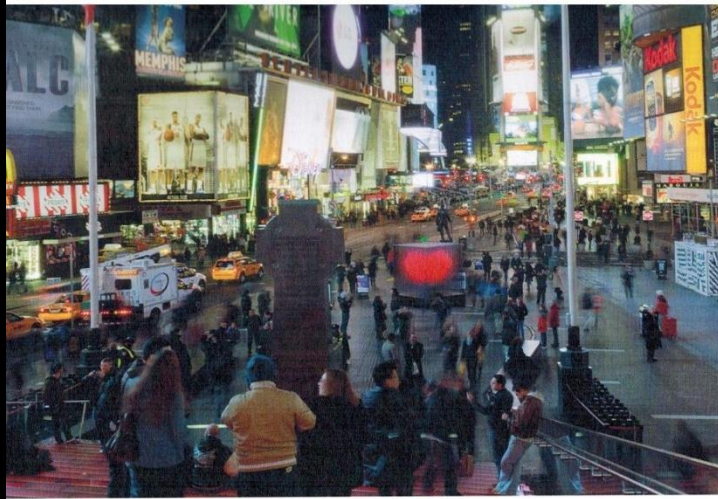


Media Buildings: GREEN PIX, BEIJING, Led media display



- *GreenPix is a large-scale display comprising of 2,292 color (RGB) LED's light points comparable to a 24,000 sq. ft. (2.200 m²) monitor screen for dynamic content display.*

Times square(NY)Valentine day 2012, voxel facade



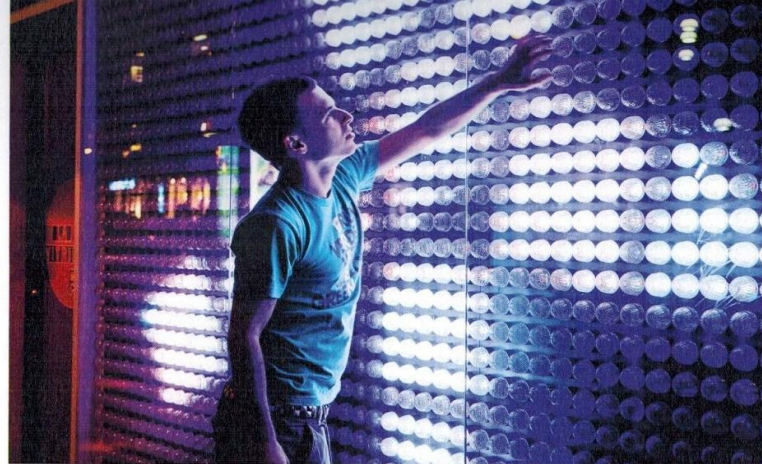
La Vitrine, Montreal (Canada), 2009

Fig. 3: Detail view of media facade with snowflake content

© Martine Doyon

Fig. 4: The media facade attracted a large number of people who participated in the interactions offered

© Moment Factory



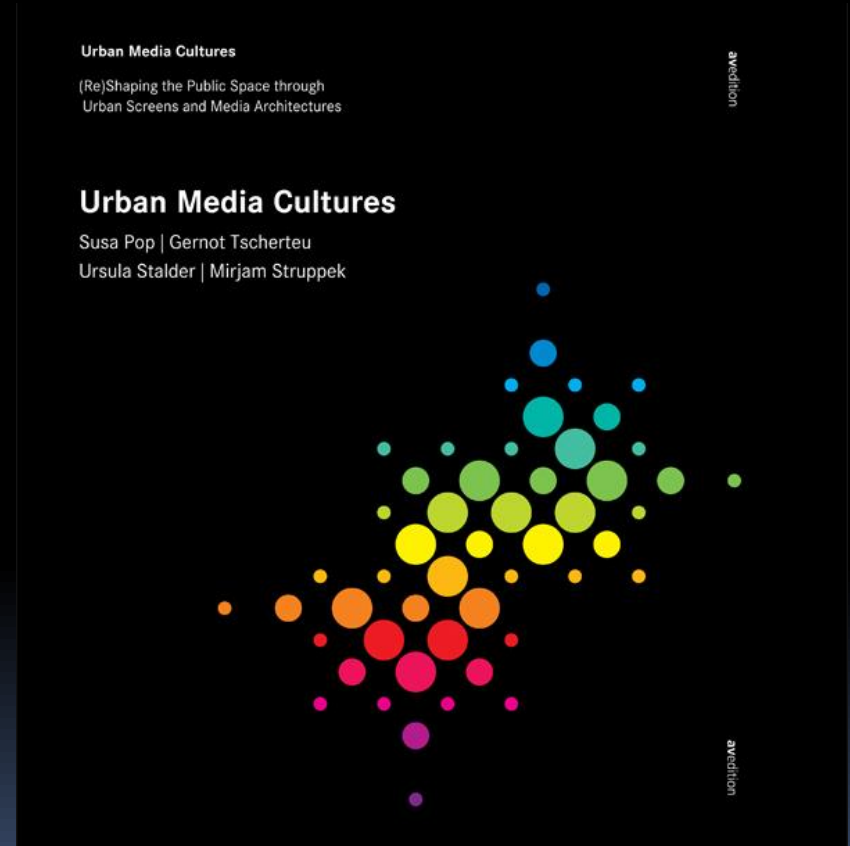
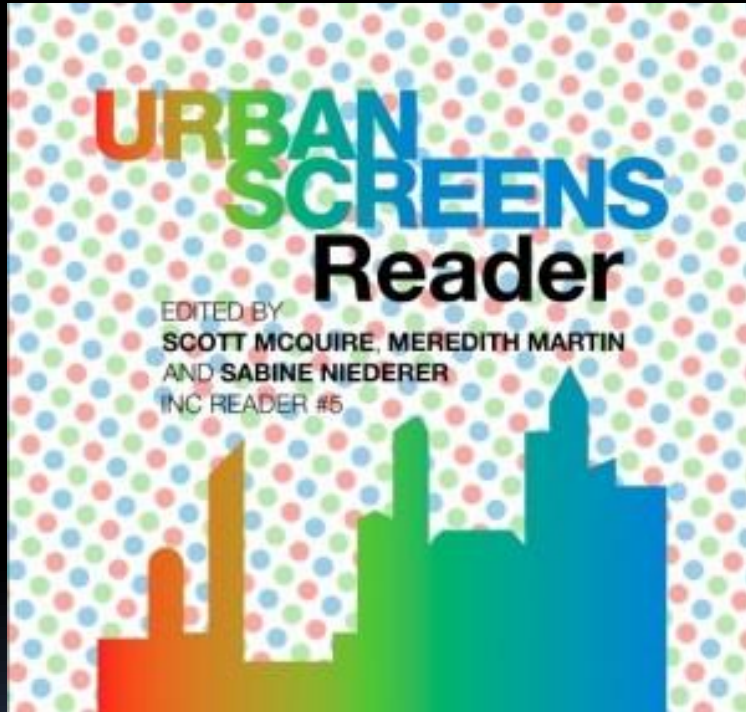
3



Urban screens and personal screens



Bibliography



- Text by Anna
Monteverdi and Enzo
Gentile (in italian)

Videomapping: definitions



It's a technique that consists of projecting video images on buildings, façades, structures or any kind of surface or object.

It's re-designing a space.

It creates astonishing optical illusions and turns reality into something else.

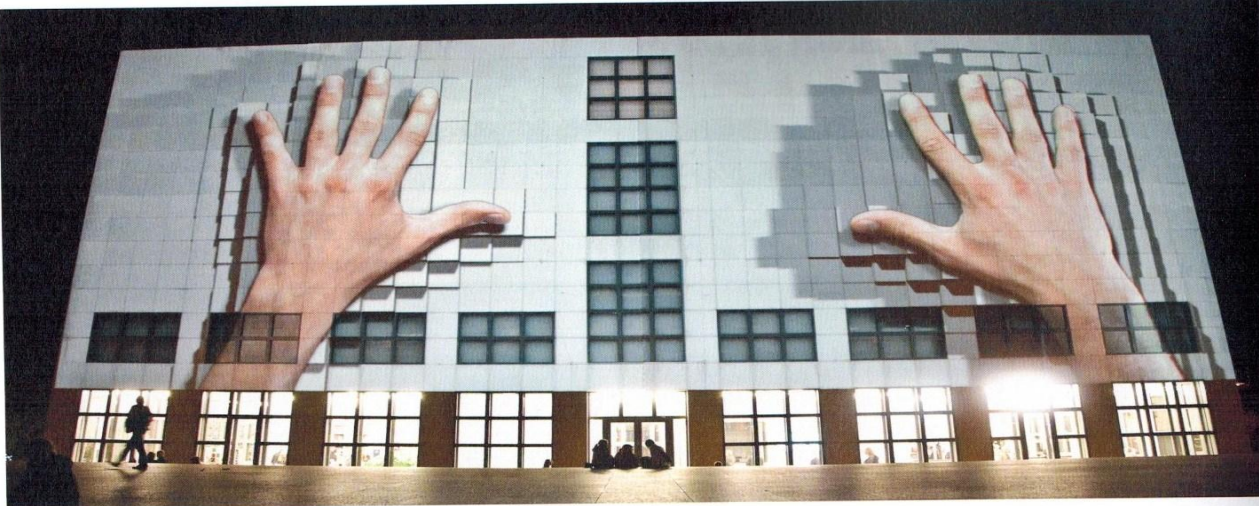
Mapping a single element..



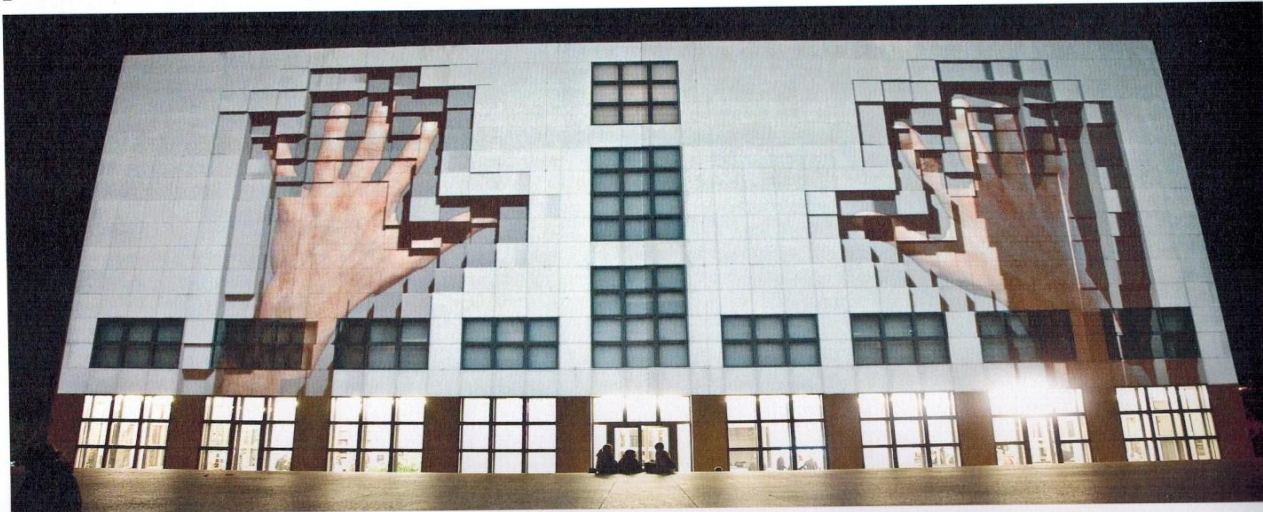
Or an huge cathedral



Urban screens-555 Kubik, Hamburg (Germany, 2009)



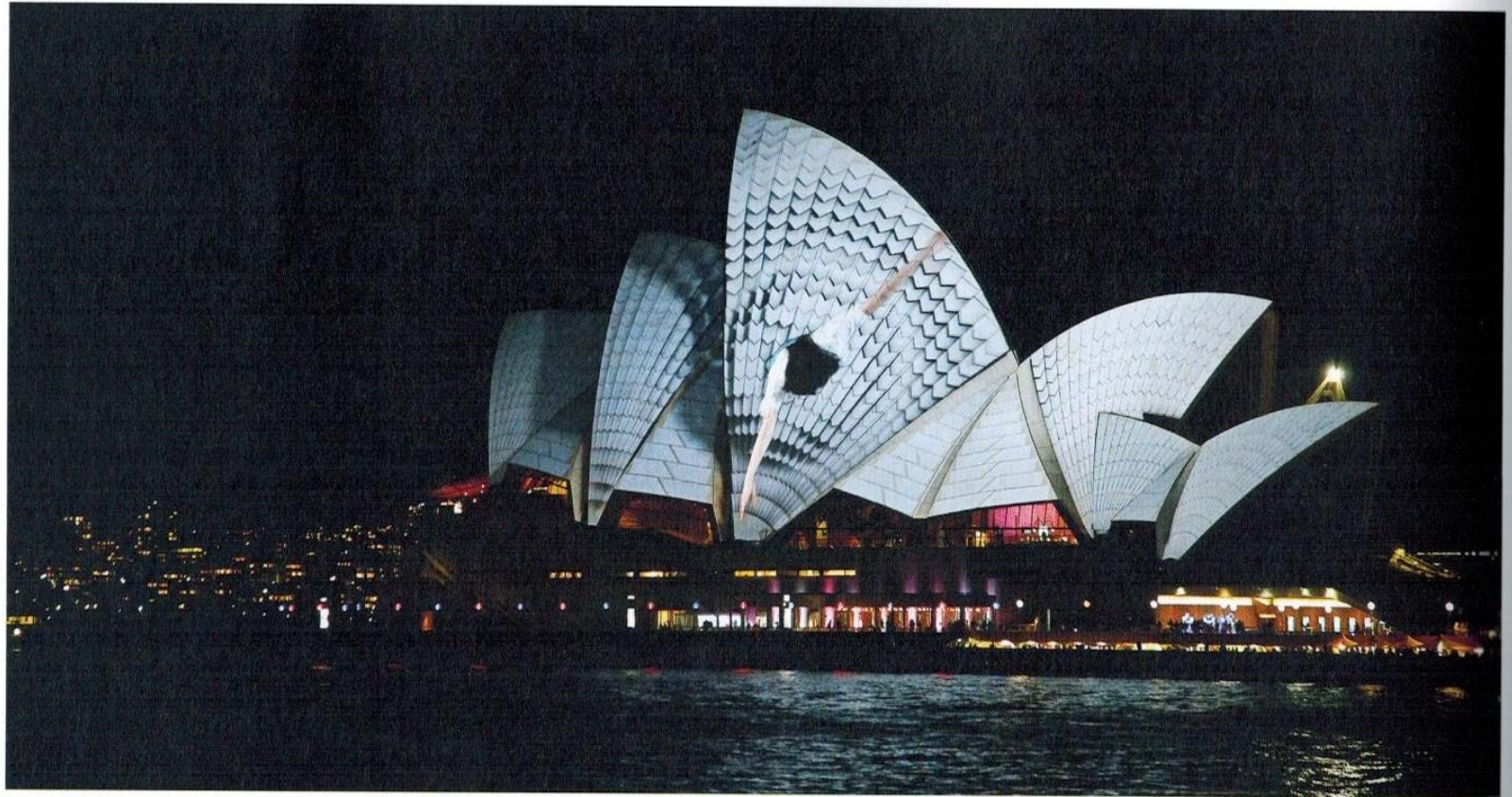
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OPERA HOUSE-SIDNEY Australia



Urban screen-Partition of the sphere. Vivide festival



Studio azzurro (Italy). La Scala, opera house, 2011



Amon Tobin



Glossary -abbreviations

Aspect ratio The ratio of the facade / screen resolution; can be roughly defined as distance of the screen to the beholder in metres equals the distance of LED to LED in centimetres.

Chromatophoric Architecture The spatial representation of information in a voxel facade where the specific intangible characteristics of an LED-based static volume 3D-display are used to generate a new architectural canon.

CRT Cathode Ray Tube, vacuum tube containing a fluorescent screen, with internal or external means to accelerate and deflect the electron beam and an electron gun, as a source of electrons, where colour CRTs have three separate electron guns. Used for both projectors and screens to form images in the form of emitted light.

Display facade General term for all media facades using electronic display technology.

DLP Digital Light Processing, a trademark owned by Texas Instruments, designating a technology used in projectors and video projectors.

DMX Controller A hardware component used in media facades to control lights via

DMX512, a standard for digital communication networks.

DSM Dynamic Scattering Mode, an effect that causes a strong scattering of light when the electric field applied to a special liquid crystal mixture exceeds a threshold value.

DVD Digital Versatile or Digital Video Disc, an optical disk storage media format with a storage capacity of 4.7 GB for single-sided single-layered disks.

EL Electroluminescent, an optical and electrical phenomenon in which a material emits light in response to an electric current or a strong electric field passing through a semiconductor.

EPD Electronic paper, also called e-paper or e-ink, is a display technology. Unlike a conventional screen, electronic paper reflects light like ordinary paper and is capable of holding text and images indefinitely without drawing electricity, while still allowing the image to be changed later.

FED Field Emission Display is a flat panel display technology based on field emitting cathodes to bombard phosphor coatings as the light emissive medium.

FX Stands for “effects” and mainly relates to illusions used in film, television, theatre, or similar to simulate the imagined events in a story.

GIS Geographic Information System captures, stores, analyses, manages, and presents data that refers to or is linked to a location.

GPS Global Positioning System is a Global Navigation Satellite System, GNSS for short, which uses a constellation of between 24 and 32 Medium Earth Orbit satellites that transmit precise microwave signals, enabling GPS receivers to determine their current location, the time, and their velocity.

HCI (Human Computer Interaction) A field that is concerned with human factors, computer science, behavioural science, and design. It involves the study, planning and design of interactions between humans and computers.

HDTV High Definition Television is a digital television broadcasting system with higher resolution than traditional television systems.

HID High-intensity discharge lamp, a type of electrical lamp that produces light by

Glossary

means of an electric arc between a tungsten electrode housed inside an arc tube.

ICT Information and Communication Technology as collective integration of telecommunication that enables users to access, store, transmit and manipulate information.

IMOD Interferometric Modulator Display is an electrically switched display composed of miniature etalons that are switched on and off by means of microelectromechanical systems.

Interaction Design A field that is concerned with the design of digital products, environments, systems, and services and their behaviour.

Interactive content Media content simultaneously recorded and displayed with the possibility of creating a loop between environment or user and display while achieving a learning curve for both user and system.

LCD Liquid Crystal Display, an electronically modulated optical amplification shaped, in the case of a screen, into a thin, flat display device made up of any number of colours arrayed in front of a backlight or, in the case of projectors, in front of a reflector.

LCoS Liquid Crystal on Silicon, a micro-projection in the case of projectors or a micro-display technology when applied in projection televisions.

LED Light Emitting Diode, a semiconductor diode that emits light when an electric current is applied to the device in a forward direction.

Live content Media content that is recorded and displayed at the same time, without having the option of creating a back loop from display to environment and back again with a learning process.

Lumen Is a measure of the perceived power of light.

Mechanical facade General term for a facade that communicates through building parts moved by hydraulic, pneumatic or electrical engines.

Media architecture Describes the cultural and social implications of media facades for the immediate environment.

Media content The visual matter displayed on a media facade in the form of dynamic graphics, text or image.

Media facade A facade into which dynamic communication elements (images, graphics, texts) are embedded. Media facades are classified in categories based on their specific technology and the particular use of the technology.

MEMS Micro electro mechanical system, a technology of the very small where components are between 1 to 100 micrometres in size.

OLED Organic Light Emitting Diode is an LED whose emissive electroluminescent layer is composed of a film of organic compounds.

PDP / plasma Plasma display panels are flat panel displays commonly used for large TV displays in which many tiny cells located between two panels of glass hold an inert mixture of noble gases. The gas in the cells is electrically turned into plasma, which then excites phosphors to emit light.

PLED Polymer light emitting diodes, an LED whose emissive electroluminescent layer is composed of a film of organic compounds.

Pre-recorded content Media content made up of data that has been collected and stored for replay at any other time.

Glossary

Projection facade Type of media facade onto which media content is projected by a projector.

Projection mapping A technique for projecting digital imagery onto surfaces other than flat walls.

Rear projection facade Type of media facade where a projector is located behind a translucent screen and the viewer faces the projector.

RFID (Radio Frequency Identification) Is an automatic identification method that uses devices called RFID tags or transponders to store and remotely retrieve data.

RGB LED Red, Green, Blue LEDs that are embedded into a single LED to produce in combination most perceptible colours, including white.

SED Surface-conduction Electron-emitter Display is a flat panel display technology using surface conduction electron emitters for displays, similar to the basic concept found in CRT televisions.

Sensors Electronic instruments that measure physical quantity and convert it into a signal readable by a machine.

Smart City Work towards the availability and quality of knowledge communication and intellectual and social capital enabled through ICT as a factor for urban competitiveness.

SMD (Surface Mounted Device) An electronic device directly mounted onto the surface of printed circuit boards.

SSL (Solid State Lighting) Refers to a type of lighting that utilises LEDs, OLEDs or PLEDs as a source of illumination.

TFT-LCD (Thin Film Transistor Liquid Crystal Display) A variant of LCD using thin film transistor technology to improve image quality.

Urban screens Defines a type of large screen that is either free standing or clearly separated and therefore not integrated into an architectural facade.

Ubiquitous City Incorporates state-of-the-art digital technologies to enable an electronically enhanced environment where all information systems are linked with each other.

Voxel facade LED-based static volume 3D-display that allows the representation of 3D media content.

Window raster animation An animation technique in which each window of a building is used as a single pixel. By combining more than one window low-resolution animations are possible.

YAG Yttrium Aluminum Garnet (Y₃Al₅O₁₂) is a synthetic crystalline material of the garnet group, used to generate white LED light.

3CRT projector System with three cathode ray tubes providing three colours, red, blue and green.

Lyon, Painted building



Trompe l'oeil

■ “



Andrea
Pozzo,
fresco with
trompe l'oeil
dome
painted on
low
vaulting
(Vienna,)



Quadraturismo is the art of creating ornamental architectural illusions common used in Baroque and Rococo era.



*VASARI,
Affreschi della
Cancelleria*



ANNO DOMINI MCCCXLIIII
MENSE APRILII DIE VIGINTI
PRINCIPALITER A DOMINO
FRANCISCO DE SORDANI
PUBBLICIS LIBRARIIS
CAROLINI PALATII
COMMISSIONARIIS
CUM AUCTORITATE
SACRAE THEOLOGICAE FACULTATIS
CENSURAE

Andrea Da Pozzo, Trompe l'oeil



- The dome and vault of the Church of St Ignazio in Rome painted by Andrea Pozzo, represented the pinnacle of illusion.
- Pozzo was commissioned to paint the ceiling to look like the inside of a dome, instead of building a real dome..

Andrea Mantegna, Wedding room, Mantua (Italy)



Troemp l'oeil "Sottoinsu" (from below upward)-Melozzo da Forlì, dome decoration



Trompe l'oeil



Marble or paint?



Escaping Criticism by Pere Borrell del Caso, 1874



Cartelami- Genoa (Italy)





MACHINE VISION:

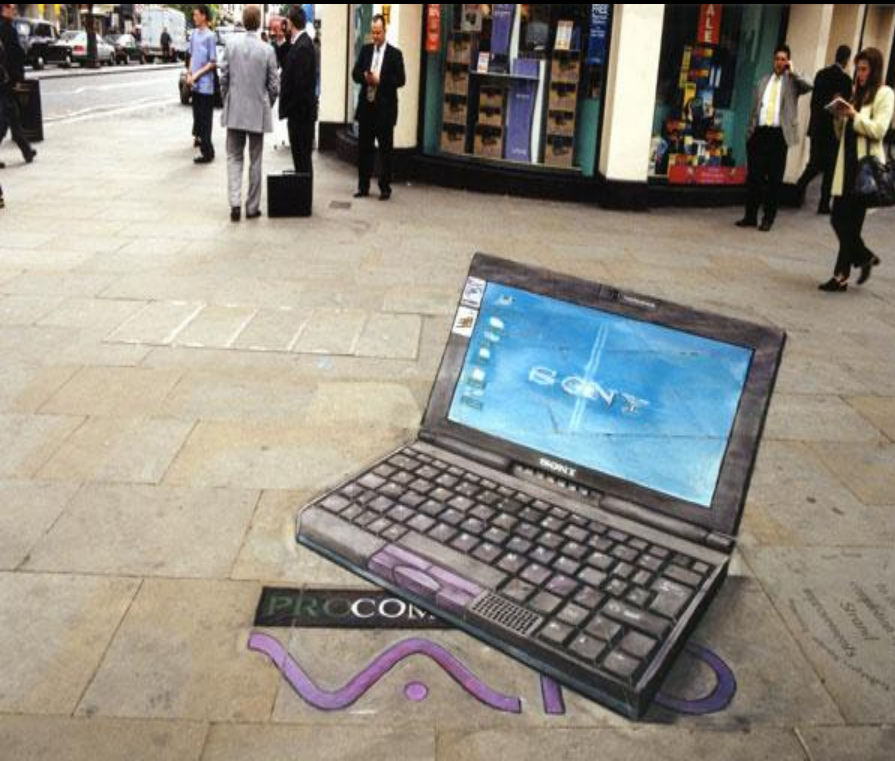
<http://www.youtube.com/watch?v=VoCZscSBeOE>



AMES ROOM-optical illusion room

- An **Ames room** is a distorted room that is used to create an optical illusion.
- It was invented by American ophthalmologist Adelbert AMES in 1934, and constructed in the following year.

Julian Beever- 3D pavement drawings



- Anamorphic illusions are drawn in a special distortion in order to create an impression of 3 dimensions when seen from one particular viewpoint



PAVEMENT CHALK ARTIST

The Three-Dimensional
Drawings of Julian Beever





Each drawing must be seen from one special viewpoint and if the viewer moves from it the illusion is lost and the drawing becomes an unrecognizable distortion.

"My work appeals literally to the man (and woman) in the street and is not confined in galleries or limited by the gallery system".
It is the internet that has brought it to the attention of the world



Julian Beever

- <http://www.youtube.com/watch?v=Ajdkj8wGP20&list=PL6D46DD7F405F73B6>
- http://www.youtube.com/watch?v=AxHYPhD_uJk
- <http://www.youtube.com/watch?v=idWFnDDq6pM>

“pavement Picasso”

"I got started when I was in a pedestrian street in Brussels where an old garden had been removed. This left an unusual rectangle of paving slabs which gave me the idea to convert this in to a drawn swimming pool in the middle of the high street! It worked so well I tried other variations such as a well with people falling in. I soon realized that if you could make things appear to go into the pavement you could equally make them appear to stand out of it." ..

Art of anamorphosis nowadays

- **Web sites:**
- ***Artists and artworks***
- www.kellymhoule.com - Kelly Houle is an anamorphosis artist in the USA. Her site displays original artworks, which can be bought in reproduction and jig-saw format, and provides a useful set of web links.
- [István Orosz](#) - a Hungarian artist; his site displays many original artworks.
- www.anamorphosis.it - Italian artists Stella and Gianni Miglietta (site in Italian).

ANAMORPHOSIS NOWADAYS

- The Swedish artist Hans Hamngren produced and exhibited a many examples of mirror anamorphosis in the 60s and 70s. Shigeo Fukuda, a Japanese artist, designed both types of anamorphosis in the 70s and 80s.
- Patrick Hughes, Fujio Watanabe, William Kentridge, István Orosz, Felice Varini, Matthew Ngui, Kelly Houle, Nigel Williams and Judy Grace are fine artists creating anamorphic images.
- Currently, Myrna Hoffman designs anamorphoses for children's interactive toys.
- The Dutch artist Leon Keer made an optical illusion painting with a life-size mirror cylinder during the 3-D street painting event FringeMK in 2010.

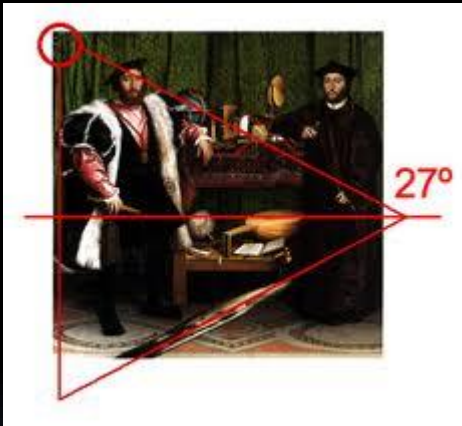
ANAMORPHOSIS CATOPTRIC

- http://www.youtube.com/watch?feature=player_embedded&v=qQ1AWAzJEH8
- This type of anamorphic art involves using a cylindrical mirror in the middle of the art piece to display a completely different image through the reflection

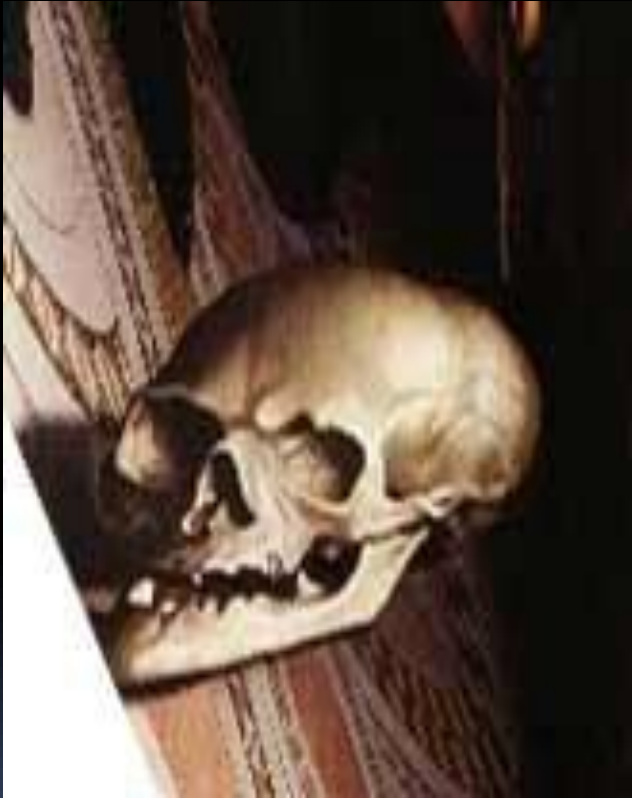
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Hans Holbein the younger (1533)

Hans Holbein the younger is well known for incorporating anamorphic trick. His painting **The Ambassador** is the most famous example for anamorphosis, in which a distorted shape lies diagonally across the bottom of the frame. Viewing this from an acute angle transforms it into the plastic image of a skull, symbol of “memento mori” (death will come)




Skull





"Anamorphic" effects in the work of contemporary artists



William Kentridge



- **William Kentridge** (born 28 April 1955) is a South African artist best known for his prints, drawings, and animated films
- These are constructed by filming a drawing, making erasures and changes, and filming it again. He continues this process meticulously, giving each change to the drawing a quarter of a second to two seconds' screen time. A single drawing will be altered and filmed this way until the end of a scene.

Anamorphosis by Kentridge

- <http://www.art21.org/anythingispossible/slideshow/on-perception/>



Anamorphic sculpture





*Phenakistiscope
by Kentridge*





...and in the theatre?????

**FROM LINEAR PERSPECTIVE TO
DIGITAL MAPPING**



Scenery, as we know it today, is a product of the **Italian Renaissance**. It is based on the discovery of the **rules of perspective and their application to the world of architecture**.

4 periods:

1) Around 1415- Filippo Brunelleschi (1377-1446) architect discovers the secret of linear perspective: a mathematical system for creating the illusion of space and distance on a flat surface.

2) 1435- Leon Battista Alberti (1404-1474) publishes Brunelleschi's secret in *Della Pittura*, the first treatise on the geometric principles of linear perspective.

3) 1545- Sebastiano Serlio (1475-1554) publishes *Architettura* the first work detailing the design and construction of a court theatre.



Serlio's playhouse was erected in a large existing room (a Hall of State) in the court palace, the standard practice of the day.

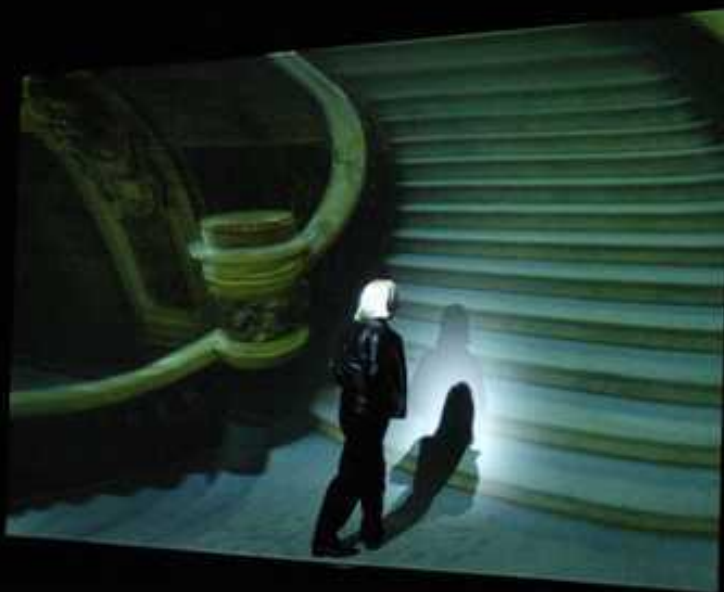
Serlio's sets (*Comic, Tragic and Pastoral*) consisted of four sets of **wings** (the first three were *angled* -- one face parallel to the front edge of the stage and the other *angled* up stage -- and the fourth wing was flat and parallel to the audience) and a **backdrop** or back shutter. His sets were conceived in architectural terms.



4)1638- Nicola Sabbattini (1574-1654) publishes *Practica di fabricar scene e machine ne' teatri* (Manual for Constructing Theatrical Scenes and Machines), the 1^o practical stage craft manual.

Points of view...

ROBERT LEPAGE
STAGE AS A MACHINE VISION



Lepage's Andersen Project



MOTUS, from Pasolini's film "Teorema"





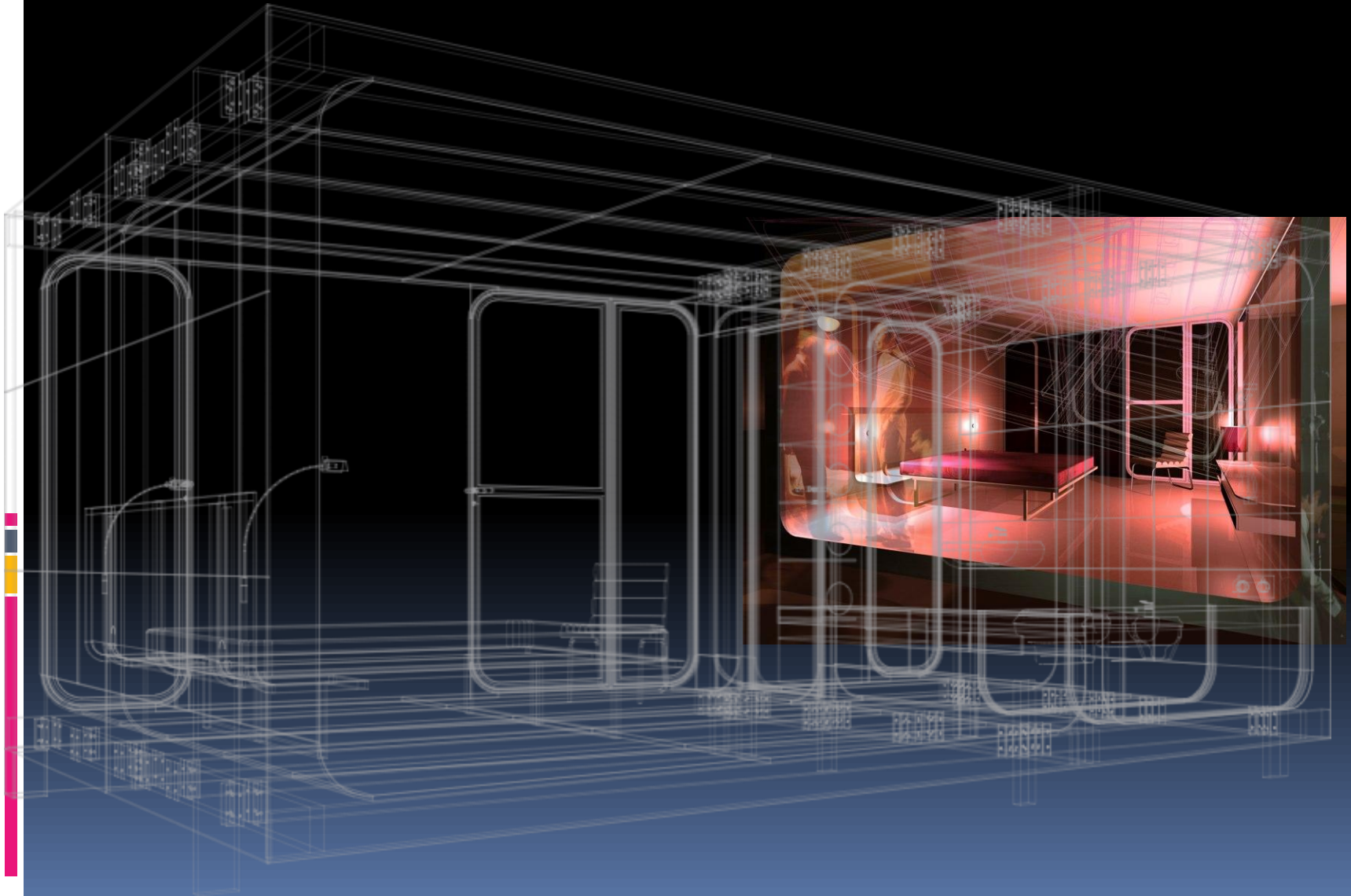


MOTUS

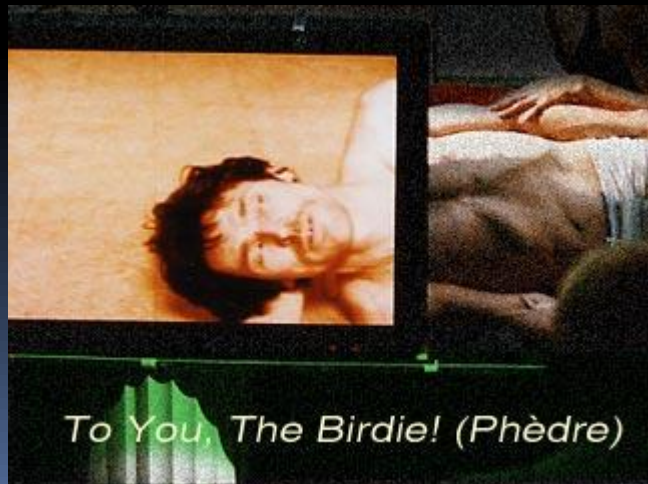


twin rooms
2000

Projects



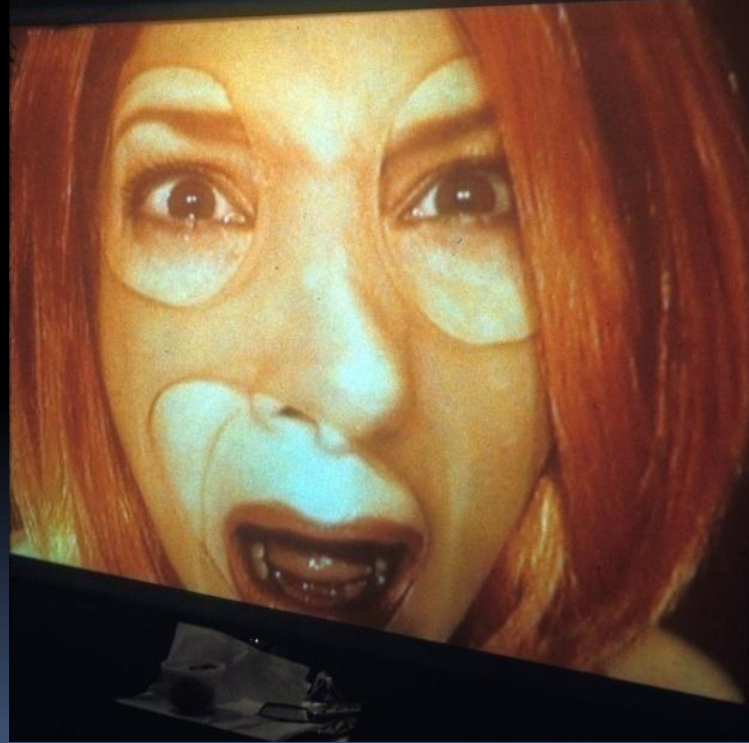
Cinema, theatre or TV?



WOOSTER GROUP

REAL TIME FIM/THEATRE BIG ART GROUP

Flicker, 2003



“To Create real time film/theatre: a desire to bring the power of the image against itself for revealing the fragile common manner of seeing

CADEN MANSON Big Art Group



Chromakey stage

Big art group, House of no more, 2004

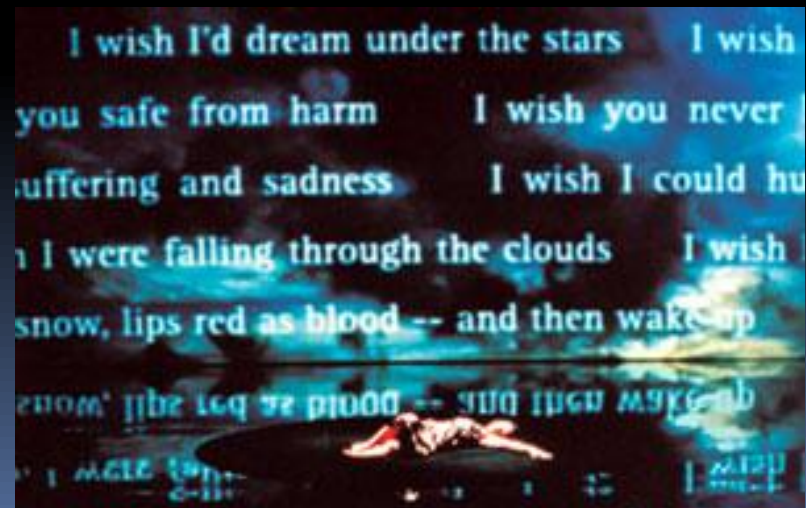
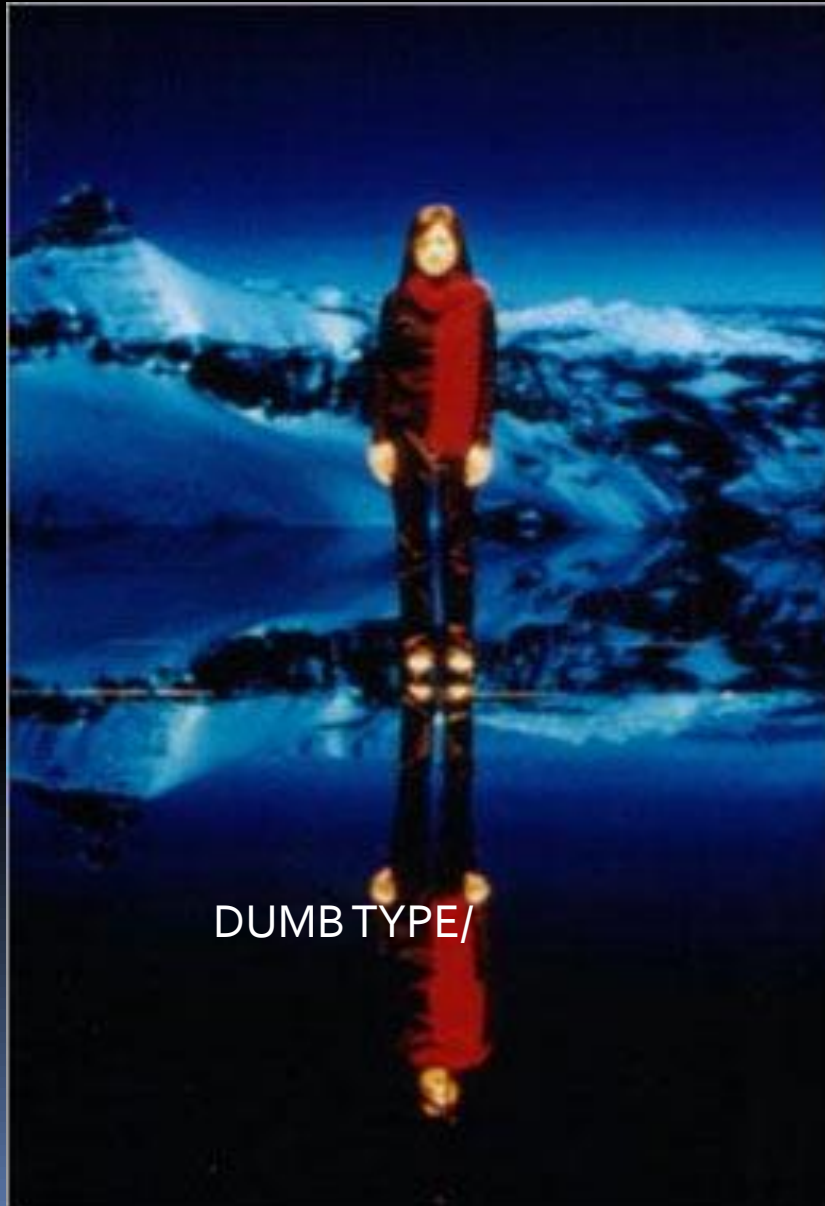
G.B. Corsetti, La pietra di paragone (opera lirica da Rossini)







Augmented visions
DUMBTYPED, Voyage, 2005



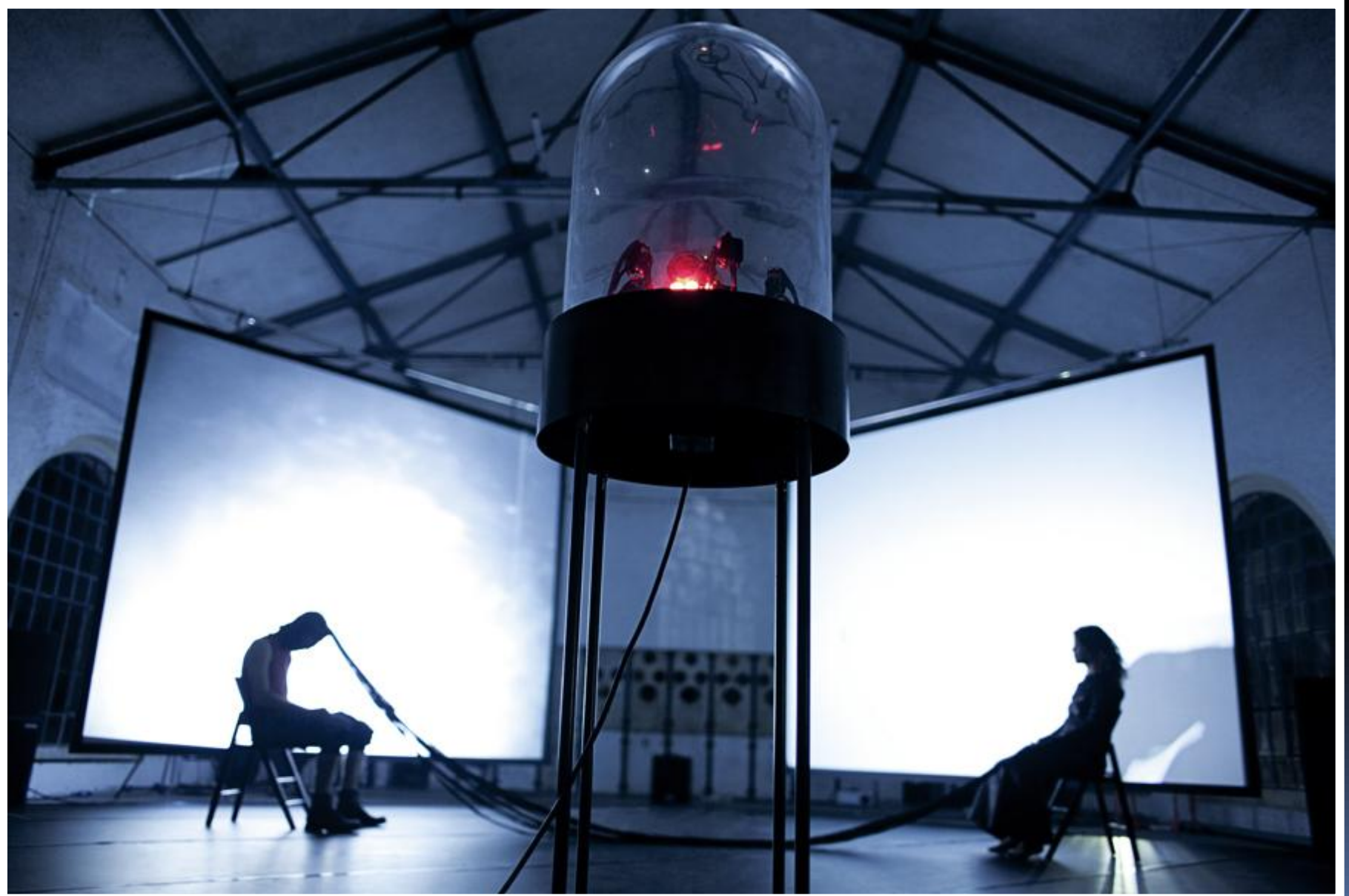
IDUMB TYPE MEMORANDUM



MASBEDO-VIDEOART+ROBOTIC



GLIMA LA PERFORMANCE



Lepage for Wagner's Ring



Videomapping on 24 placks



Cinematique, Adrien Mondot
+emotions software





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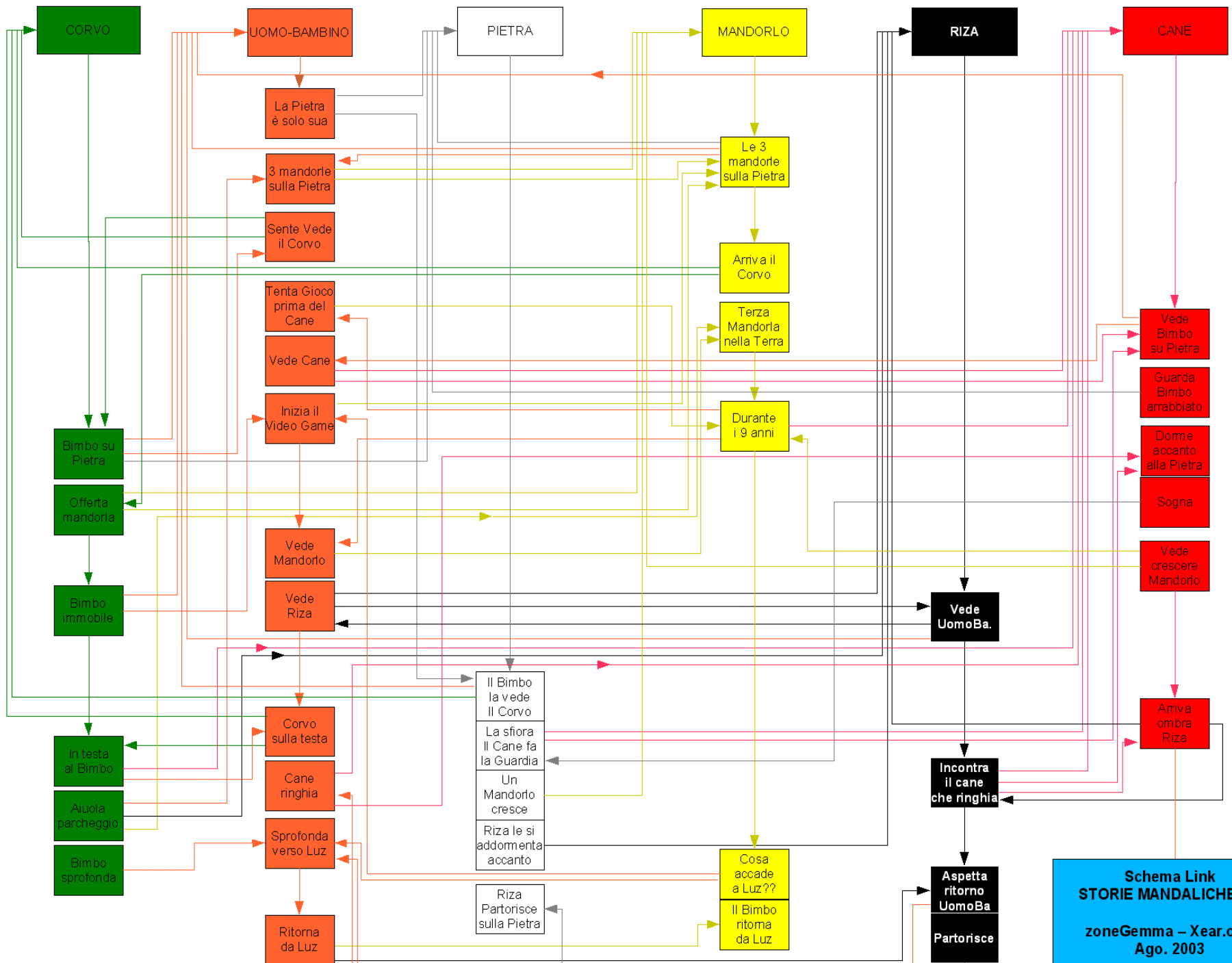
Motion tracking, KLAUS OBERMAIER/DAVE, 2003



<urban screen.IDOMENEO



Mapping objects



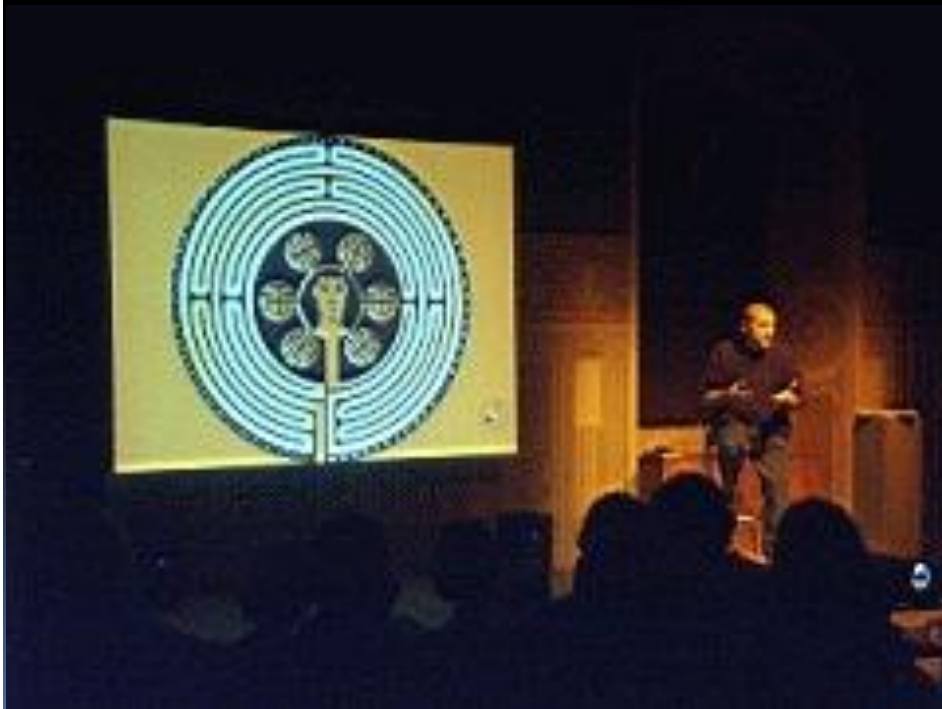
**Schema Link
STORIE MANDALICHE 2.0**

zoneGemma - Xear.org
Ago. 2003

3 versions

- **1st: 2000 MANDALA SYSTEM**
- **2°: 2002. Flash Mx**
- **3°: 2008. Datasuit.**

NARRAZIONE TEATRALE IN AMBIENTE DIGITALE



Flash mx frontale

Flash mx a cerchio



I racconti del mandala

Set audiotecnico:

- Radiomicrofono
- Esoscheletro wireless
- MIDI da esoscheletro a Max/Msp per texture, live processing, virtual sounding

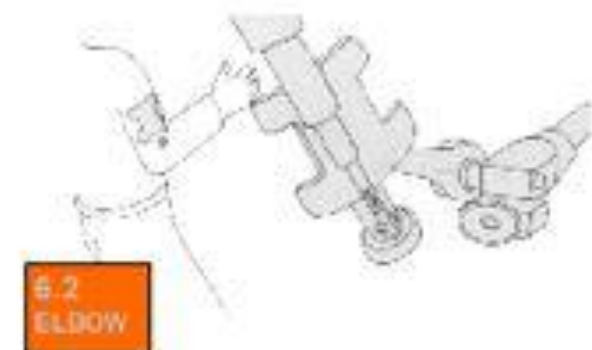
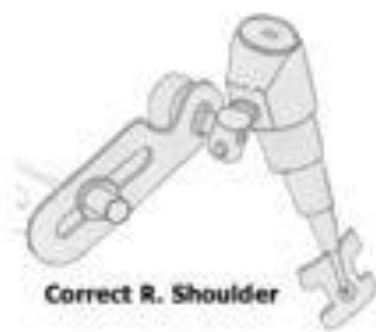


- MIDI da esoscheletro a Arkaos per controllo e gestione live video
- videoproiezione
- multidiffusione audio



HARDWARE

Corretta collocazione dell'esoscheletro



SCHEMA DELLE CONNESSIONI

