

# Mirror\_SPACE Project

## System of Real Time Events and Installation

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### Abstract

Interactive networked installation, which projects a personal, virtual mirror-image onto the screen, with the aid of the combination of the face of the visitor and data collected simultaneously from the Internet. This image behaves like the physical presence of a real mirror-image: it changes its position, dimensions and features according to the movement of the viewer. The common mirror-representations of individual visitors also interact with each other, and their audiovisual representation is perceivable as within the "mirror-space". The "mirror-image" is active and alterable as long as the visitor remains in the data-space of the installation. When the visitor departs, the image, as her/his "impression", remains and continues to move together with other representations. The mirror-images of the previous viewers disappear finally when the images of new visitors appear on the screen.

Mirror\_SPACE is a virtual mirror where users can experience their image transformed - not according to the rules of geometric optics, but filtered by a "real time scanning apparatus". This generates the visitor's "mirror image" corresponding to the information supplied via its data network.

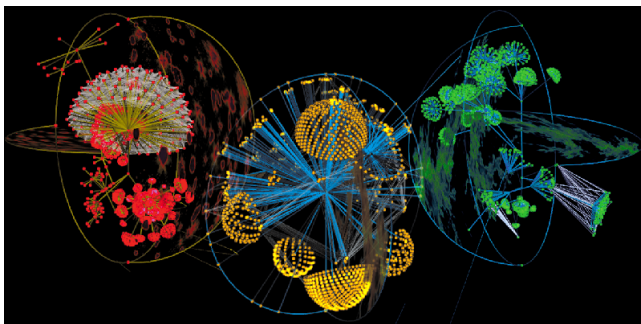


Figure1 The visualisation of Mirror\_SPACE project

### 1 Introduction

The mirror provides us with phenomenal images of our appearance according to physical laws. The mirror image is a transformed, cell-shaped manifestation of the users dynamic data. The aesthetical qualities of the objects combine a microcosmic vision of networked existence with a reduced visual component (virus/nano vision). Their virus-like nature represents a structure in which everything is interconnected. Depending on the quality of the relationship, this

connectivity is visualised differently. The coloration of the creatures is an expression of their character.

Mirror\_SPACE is a system of reflections of a type which involves not only optical appearances but also forces which act on us and which we cannot control affecting our phenomenal image. Visitors are invited to identify with a virtual mirror image that reflects their internal state (through mood analysis) and their external affiliations (through information streams from the internet). This new world formulates a utopian definition of identity.

The person is viewed as a node which is networked with the whole of existence. Effects which can be grasped by our perception are presented in this system as dynamic data and converted into three-dimensional objects. This process also involves the compilation of a virtual image, but the filter is the calculation on the part of the computer, which not only processes our extended characteristics but also data supplied simultaneously from the world.

### 2 Exposition

The Mirror\_SPACE is a communication system based on a complex scientific-artistic concept. The development started in the end of 2003 with the aim of achieving a higher-level interactive information exchange between man and computer. Through the communication among different softwares (3D visualisation, motion-tracking, data analysing and sound effects programs) and the Internet, the real-time system creates an audiovisual sequence of events while taking into consideration the properties and movements of the spectator. The work examines how this audiovisual sequence created by the interactive system affects the user experience.

Interactive Installation: A large dark room is illuminated by a single thin beam of light where visitors can generate mirrorimages. The scanning process takes about ten seconds, during which an infrared camera analyses the face and extracts mood values. At the same time, a data packet consisting of dynamic global information from all around the world is retrieved from a number of internet sources. This packet represents the ever-changing surroundings of our digital society and the combined data controls the object generation process. Depending on the calculated mood value, different object templates, structures and layers are included. The resulting object is typical for a person and time, and each has an individual structure and colour scheme. Based on these properties it is possible to derive a meaningful interpretation. After the scanning beam has disappeared, the generated object sticks to the visitor like a mirror image.

The sources: 1. Infrared image analysis of the face. This program enables the evaluation of the user's mood values and to forward them

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into the visualization system. These data are subject to effects according to the shape and colour of the object and other energy options.

2. Dynamic data analysis scans the data for object generation from the data flow supplied from the internet at the corresponding time (scanning process). The analysed data: satellite photographs, live cam images, weather data, stock exchange data, traffic data. Data which are supplied from all over the world are generated from certain values which relate to the status of the human information radiation. Using these data, an attempt is made to present an image of the events affecting the world. [Pattern analysis software: "Capsule"]

3. An additional tracking system scans the visitor's position in space. The x and y data will control the 3D creatures and the sound objects. This system enables several persons to be tracked. Although it is not possible for the identification process to function without error when there are more than a certain number of visitors, it is possible to introduce an extension facility. [Multi-user motion tracking software: "Augenblick"]<sup>†</sup>

**Real Time Scanning Apparatus:** The scanning apparatus is responsible for scanning the user. It incorporates several programs to analyze the user-created data. The scanning process will analyze a user once he positions him/herself under the scanning ray of light for 5 seconds. During this time, the dynamic data are downloaded from the internet and analysed. In parallel, the user's facial analysis is carried out. This process involves the object which belongs to the user being generated on the projection surface. The scanning process does not function while the projection surface is empty. This process will result in the three-dimensional mirror objects, which always develop in the foreground of the image or in virtual space. The other, already existing objects move in the background.

**Object generation:** Then the object generation creates a three-dimensional object, which moves in space according to the type of its kinematic chain and which is confronted with already created objects. These creatures remain in the shadow of the visitors and gain or lose energy from the energy potential of the room depending on their movement. Energy fluctuations control the speed of movement of the objects. Mirror images disintegrate if their associated person leaves the installation.

**Characteristics of the Mirror Objects:** All visitors have a shadow object, which they can control with their movements. The objects do not, however, move only in conjunction with their source person. They also interact with one another. The VR objects have specified characteristics from the time that they come into being, and some of these characteristics continue to change in the course of their interactions. The principal characteristic of these creatures is that they are drawn as by a magnet into following their owners. The user controlled mirror bodies also involve objects acting on one another and their characteristics being affected by one another. The various types of contact lead to the objects changing their appearance and their energy characteristics. The avatars may pass on their characteristics or lose them if there is a great force of collision. In the course of this exchange of information, they will visibly change, while retaining, however, their basic characteristics. In the event of a large loss of energy, the object may disappear.

**Sound object of the mirror object:** The purely computer-generated

music is generated from sine tones. The various options are determined also by the scanning apparatus or by the supplied dynamic data. The sound objects will also bear characteristics which are characterized by the user's movements. Because the sound continues to receive data from the tracking system, a reaction chain of the movement is also presented.

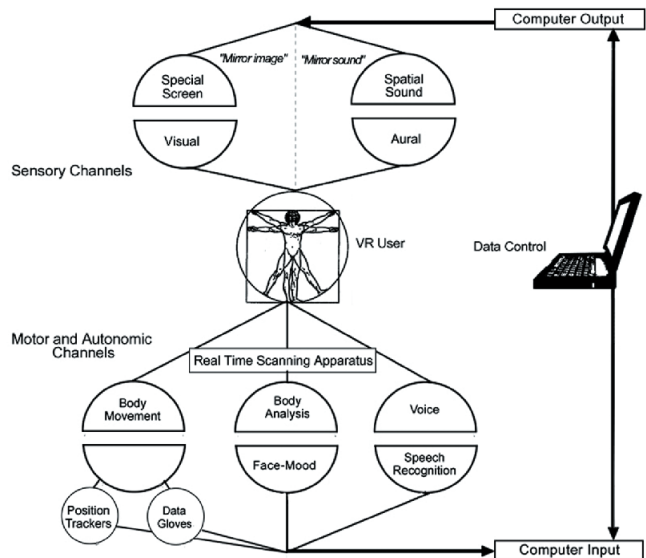


Figure 2 The VR-System of Mirror\_SPACE project

### 3 Conclusion

Virtual Reality has a potential attribute which supports creativity, and with which the imagination of the artist can be freely defined. The goal of the artist is to reach a balance with which he/she creates his/her "own reality". The simulated world is a new environment, through which creative, philosophical, scientific visions can be presented in an aesthetically satisfying way. The ultimate task of the VR-system (which consists of a patron, sensors, the constructed Cyberworld, effectors, physical space and other connections of interface and network) is that the patron should concentrate – through Cybercommunication (a series of feedback) – solely on the presented virtual world. This allows more information to flow in, which creates a new Author system the artist can take possession of, and through which the quantity of sent-received information is close to each other. The character of the new artificial realities allows artists to create innovative communicative (new Model of Communication), perceptive (new Model of Perception), imparting (new Model of Imparting) forms and visual language.

The computer is a human-prosthesis and an artist-prosthesis as well, which allows us to explore our inner world with innovative use of new technologies.

**Future Vision:**

1. Developing a system with the help of technology which is capable of expanding human consciousness through reactivity.
2. A dialectic technology is to be developed, allowing the user to modify objects by means of spatial and physical navigation systems.
3. Users' experience the avatar as an extension of themselves into another dimension and are given the opportunity of fulfilling all their desires that cannot be realized in the physical world in virtual space.

Project Web Site: [www.zics.net/mirror\\_space](http://www.zics.net/mirror_space)

<sup>†</sup>Software Credits:

Sound/Programming: Jörg Lindenmaier

Graphics Programming: Jeroma Thoma

Capsule Software, Analysis of data and face: Matthias Weber, Marco Rütter

Additional Software: Augenblick 01, Motion Tracking Software:

Matthias Weber, Ursula Damm