

## TTRACKING THE NET

Motion Capture&VR Interactive

**Original idea:** Franz Fischnaller. F.A.B.R.I.CATORS, Milano, Italy.

**Content Development, Virtual worlds :** Franz Fischnaller

**Plug in development & programming:** Marco Monzani, ELEKTON. Milano, Italy.

**Real time tracker:** Elekton

**Hardware:** Qualisys AB, Goteborg, Sweden

**Software VR :** Division Ltd, England

**Production**

F.A.B.R.I.CATORS & ELEKTON

---

## TRACKING THE NET!!!!

Virtual Reality+optical motion capture interactive Platform.

A collective interactive installation!!!! Over 10 user can interact in real time Simultaneosly.

The installation its an interactive, cubicular, elastic, netted cube of 3X3 mts with rear-projection onto one wall -screen with high resolution image. *It* is designed to be used through Internet, being tracker commands adequate to be transmitted through a narrow bandwidth transmission line

The visitors can freely interact and navigate within the virtual environments by interacting with the "Net". By touching it , pulling it, stretching it.! they will be able to navigate, manipulate and interact with objects, sounds, worlds, voices. The visitor will get back in real time the feedback of the "Net"

Tracking the Net is a powerful VR & Motion Capture installation which allows several visitors to interact in real time simultaneously just by using their body limbs, the senses and their intuitions

Tracking the Net expands the boundaries of the traditional media and of the classical interfaces. The devices used to *sense* user actions are "invisible". Its a surprising new way of interacting with VR within several users!

The interactions between the subjects and the "Net" are identified by a motion capture system based on Qualisys optoelectronic technology Any movement is captured with extreme precision (up to 0,1 mm resolution)

### Use and application:

Tracking the Net can be installed in Interactive centers, museums, multimedia parks, fairs, and even rehabilitation facilities. It has been designed for different uses in different fields such us cultural, architectonic, design, artistic, games, physical rehabilitation, and research.

The structure both from electronic and from mechanical standpoints as well as the content can be developed and produced ad hoc.

### Technical description

Special cameras detect position of small infrared beam reflectors placed on different points of the elastic network. A computer-based process generates real-time 3D

positional information about reflectors, and issues commands to another computer which hosts VR software. Software: Division by Division Ltd. Plugin for Division (Elekton). Real time tracker (Elekton). Hardware : MacReflex cameras (Qualisys AB), two Pentium based Windows NT workstations.

### **Content development**

We are currently producing several demos in order to show the potentiality of "Tracking the Net" as it is now. At the same time opening new pathways for the development of virtual contents. This is done by exploiting the features of the system as a general purpose, fully configurable interface. We are putting the same effort into exploring the possibilities of device enhancement from the technological point of view. The aim is to realize more and more innovative and highly creative applications, original and surprising effects, astonishing virtual worlds !!

### **Actual Technical Development**

- Improving, enriching and expanding the structure Tracking the Net will size more than 4x4 mts with rear-projection onto 4 walls, instead of one rear-projection with high resolution image (stereo and non). Able to host over 20 interactive visitors who can navigate and interact simultaneously in real time.
- Working programmatically to improve performance in the VR environments for the best, most realistic experience
- Improving the interaction, adding interactive elements
- Experimenting operation through networks

### **Innovation**

Real time tracking applications are traditionally exploitation area of magnetic trackers that are capable of retrieving true real-time positional data but featuring several limitations. Our system is able to detect position of 10-30 reference points in real-time with high accuracy and virtually without interferences.

---

**Contact person:** Yesi Maharaj Singh

### **F.A.B.R.I.CATORS**

*ARCHITECTS OF CULTURE - FABRICATORS OF IDEAS*

Via F.lli Bronzetti 6, 20129 Milano/Italy

Phone: +39-02-70128233 - Fax: 39-02-76110498

cell: +39-348-2310451

e-mail: [fabricat@galactica.it](mailto:fabricat@galactica.it)

[www.fabricat.com](http://www.fabricat.com)

## **Tracking the Net as a motor rehabilitation tool**

### **Key features**

- High number of degrees of freedom in the interaction
- Great emphasis to motor coordination and proprioception
- Elastic reactive characteristic
- Multi-user activity
- High motivational level
- Structure flexibility and acoustic/visual feedback versatility
- High reliability and precision of Qualisys motion capture optoelectronic technology

**High number of degrees of freedom in the interaction**

- Movement is made by translations and rotations on any axis
- It is possible to interact using more limbs at the same time
- Multi-segmental movements (kinetic chains)

**Great emphasis to motor coordination and proprioception**

- Compared with muscle training, the interaction grants:
- an improved movement coordination, with relation to agonist action and to fixative/postural mechanisms
- an increased proprioceptive sensibility

**Elastic reactive characteristic**

- Elastic resistance is expressed gradually, thus helping recovery even in very serious situations
- It is intrinsically safe, being proportional to concentric action performed by the subject

**Multi-user activity**

- Many subjects may operate in the structure at the same time.
- The intercorrelation degree among the actions of the different subjects is defined within a very wide range, both mechanically and as a feedback

**High motivational level**

- Various components apply to increase motivational degree in comparison with traditional therapies:
- variability and refinement of acoustic and visual feedback
- interaction diversification
- contemporary and intercorrelated activities of different subjects

**Flexibility and versatility**

- The structure configuration can be different in shape, dimensions, number of interactive walls, visual feedback (projection monitors)
- Feedback, being given by modifications in a virtual ambient, can be reset with no significative restriction

**High reliability and precision of motion capture technology**

- The interactions between the subjects and the net are identified by a motion capture system based on Qualisys optoelectronic technology. Any movement is captured with extreme precision (up to 0,1 mm)

**Prospects**

- Short term: conclusion of scientific validation phase
- Medium term: definition of its role within general rehabilitation strategies
- Medium/long term: installation in rehabilitation centers

**Contact person:** Yesi Maharaj Singh

**F.A.B.R.I.CATORS**

*ARCHITECTS OF CULTURE - FABRICATORS OF IDEAS*

Via F.lli Bronzetti 6, 20129 Milano/Italy

Phone: +39-02-70128233 - Fax: 39-02-76110498

cell: +39-348-2310451

e-mail: fabricat@galactica.it

www.fabricat.com

