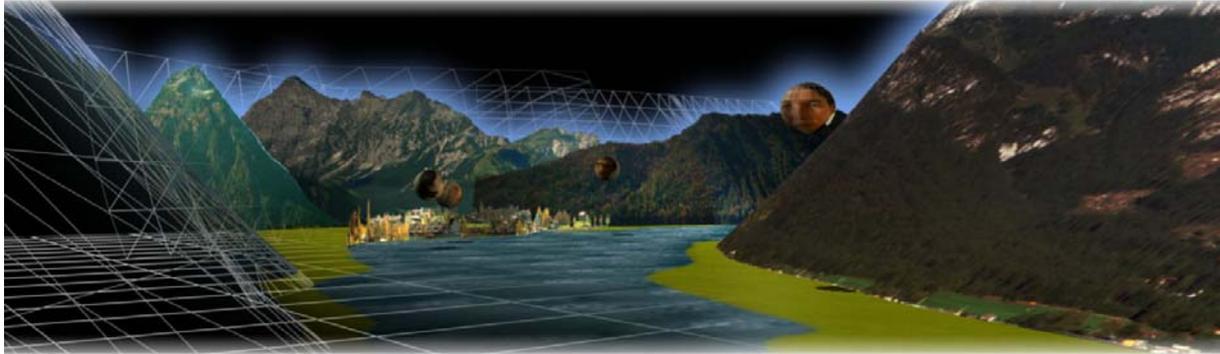


# R.O.S.I. (Real Time Orientation Super Interactive) The new Dimension of Tourism Information

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Tab. 1: Virtual Region, 3D Userinterface (Irschitz99)

## 1 ABSTRACT

R.O.S.I. is a system for orientation, information and communication. It's a broad, interactive and 3dimensional information system for the tourism, where every region which is interested, could be integrated and interconnected. The system is open and flexible and is capable to be adjusted to the topography and the very needs of each region. Also existing databases like room vacancy, ticket sales, etc. could be accessible!

The more area-wide the system gets, the more interesting it will be for the user, because of the increasing volume and density of the information.

A 3dimensional and partly photorealistic Visualisation of the region serves as the user interface of the software. So the topography of the region will be reconstructed as an abstracted wire frame model with photomaps, which contains every prominent and important point of the region.

The underlying information will be available through movie clips, life cams, pictures, graphical-, and spoken information, etc. The navigation of the interface is intuitive and touch less via an infrared light curtain or a infrared camera tracking system. The user points on anything he is interested, and the system provides the available content. The information about activity and attractions is allocated in the virtual space according to its real world position. In this way you achieve a recognition between the virtual and the real and vice versa. This will improve the orientation as well in the real world as in its virtual counterpart. The navigation of the 3d user interface is by hand or finger, so the finger turns into an alternative for the mouse. In this way you can travel to any point in the virtual region, you can either glance from the peak of a mountain, get in the perspective of a boat cruise or fly through a valley; everything is possible. The virtual journeys are a mix of 3d graphics and realistic videos out of a helicopter. By mixing this two techniques, the realism and immersion of the virtual world will be augmented and even closer relations between virtual and real will be established.

R.O.S.I. is not just a death information landscape, but also a communication platform for tourists and locals. ROSI as a patroness and various avatars (virtual characters of the user or the system) will populate the region and will bring life and spirit in the system. Every user, no matter from what info point he is accessing, will get his personal avatar in the cyberspace. Thus he will be enabled to communicate with others and has the ability to exchange experiences or tips of lovely places or just chat.

## 2 ARCHITECTURE AND DESIGN

### 2.1 Philosophy

Interactive systems are twofold, the design of the real world and the design of the content and its interface.

Design is the attractor and the catalysator. It should draw the people inside or to the point of interest. If this is accomplished, architecture/design should fulfil needs of comfort ness, functionality and should invite to stay longer. Now the interface and its feedback plays it role! The simplicity, intuitivity, efficiency and speed of response is crucial for the first impression and decides if the user will stay or leave! So a good working interactive system just can be achieved with a good cross design concept what allows a liquid transit between it's Real and the Virtual parts. First I want to address the real world integration. There are two basic ways to install R.O.S.I., static or mobile.

### 2.2 Static Infotainment Point

The first project has been developed for the Achensee region in Tyrol/Austria.

The goal was to create a marvellous viewpoint over the lake that could be augmented with a virtual information system that is capable to give the user an overview of the region within a couple of minutes. So the guest gets both, the impression over the natural

beauty of the region and an quick overview of the leisure facilities and accommodations there, via R.O.S.I. All this happens in a playful and exciting way it's a mixture of film, game and information experience.

The construction of the info point itself is out of steel and glass, freely hovering about 30 meter over the lake. Its freely accessible and self explaining.

To achieve both, as well an open and friendly structure where you have a great view over the landscape, and a closed and obscured space where you have good projection and sound capabilities, the construction has to be adaptable automatically. This is achieved by lamellae, that open and close when the info system is started and a PRIVA-LIGHT projection screen that is either transparent to look through or opaque to project on it. All the hardware and projection equipment is stored in a air conditioned case, so it will be functional at any weather and is secured against vandalism.



Tab. 2, 3: Inside with 3D Infosys., Sideview of the viewpoint (Irschitz99)

### 2.3 Mobile Road show Container

For PR and advertising purposes like , road shows, fairs, exhibitions, etc. the system can be integrated in a mobile road show container, called the iTube.

It is especially constructed for a quick set up in any location, it just needs electricity. It can be transported either by truck, ship or airplane. There is one iTube for outdoor use, which is a metal construction expandable like a telescope and one iTube for indoor use which is an easy construction kit out of honeycomb sandwich panels. All the necessary hardware and projection equipment is integrated like it is described above in the static info point.



Tab. 4, 5, 6, 7: iTube, transport, setup, inside (Irschitz01)

## 3 HARDWARE AND TECHNOLOGY

### 3.1 VR-System for Visualisation

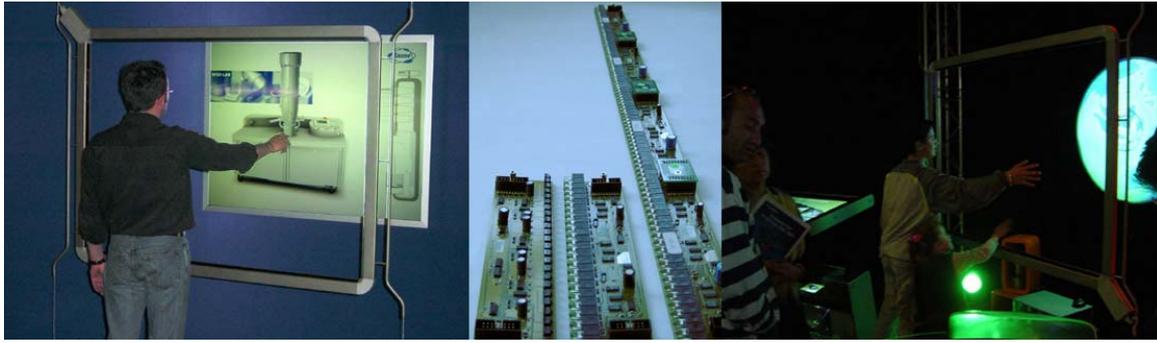
The Configuration of the underlying hardware is very simple. The system is driven by a standard Pentium 4 PC with sufficient RAM (e.g.: 512 MB) and a good Graphic accelerator (e.g.: Geforce 4 or ATI Radeon...). The graphic output will be shown by a projector, either front or back projection, that depends on the situation.

### 3.2 Natural Input systems

To interact intuitively and touch less with a big screen projection without any appliance in your hand you need special hardware. This kind of interaction is crucial for the ability to give access to the broad public, to be destruction secure and still user friendly. There is nothing more natural than using your hand to point on things of your interest. Like Tom Cruise does in the Spielberg movie "Minority Report" as he conducts the pictures in front of him like a maestro his orchestra.

#### 3.2.1 L.I.P. (LightInPutdevice)

The light curtain LIP is based on a very simple principle. It consist out of a matrix of Light transmitting LED's and receiving photo-diodes in the infrared spectrum that build up a light curtain. By scanning up to 50 times (50Hz) trough this array, the curtain scans the movement of either a finger, hand or whatever you put in the frame. The so generated coordinates of movement serve to drive the mouse cursor, which drives the system.



Tab. 8, 9, 10: iFrame and 3D Userinterface, circuitplates L.I.P., kids playing with the iFrame (Irschitz02)

### 3.2.2 Camera based user tracking - Computer vision system

This system works with an infrared camera, that sees the hand. By a special algorithm the hand or finger will be detected. Due to pattern recognition the movement of the hand will be followed and so coordinates of movement created. Those coordinates drive again the mouse cursor which drives the system.

[Sparacino, <http://www.sensingplaces.com>]



Tab. 11, 12, 13: iTube and Feedback from Cam, natural Cam Interface, IR-Cam in iTube (Irschitz, Sparacino 03)

## 3.3 Peripheral Interfaces

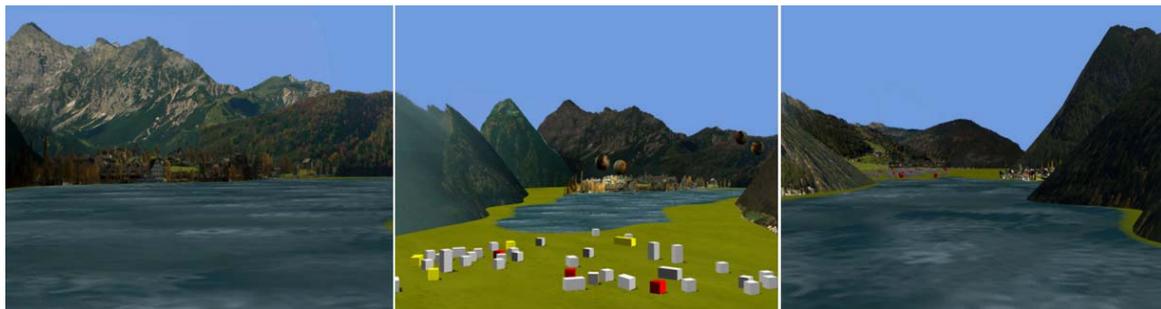
To get information out of, or in the system and to provide something to take away for the user, such interfaces can be implemented. Like printouts of important information, maybe a movie of the flight that will be saved and downloadable on a website.

It could be interesting to connect the system with a room vacancy database or a booking system for tickets.

## 4 THE INTERFACE AND THE ACCESS TO INFORMATION

### 4.1 3D User interface

The user interface is the main visual part in the communication between man and machine. It has to be simple, intuitive, efficient and even more important has to give good and necessary feedback. This points are especially important in a public system, because you have non-experienced users with sometimes little to no computer experience. So a 3d user interface makes sense to apply. The metaphor will be a visualisation of the region itself, so the user has a recognition effect between the virtual and the real region. It further helps for better orientation in both worlds as well. To achieve this the virtual region has not to be completely photorealistic. Its enough if the prominent and significant points run into the geometry. Photographic maps of the region, applied on the appropriate geometry will gives the model a sufficient realistic look. Mixed with graphical maps and 3d models that shows and indicate any supplied information, the model gets completed. The Level of Detail will depend on the distance of the viewer, if he flies high or low over the ground.



Tab. 14, 15, 16: Visualisation of a semi photorealistic 3D Userinterface (Irschitz,99)

## 4.2 Photorealistic Visualisation mixed with real world Video sequences

Flying is the only way to get around in the virtual region. Either you fly high to get an overview, or you fly low to find the details. There are as well predefined viewpoints where you can jump to and predefined flights or cruises where you can embark. This predefined flights and cruises could be real film material, like helicopter flights, train,-boat or car-rides. They connect either the predefined viewpoints or are special events within the model. This predefined viewpoints could be also connected with web cams in the real region. So a patchwork of real and virtual experiences is created that enhance the action and the realism and make sure that the user will get a breathtaking experience. –INFOTAINMENT- would be the appropriate term for that.

## 4.3 Navigation and Information Access

The movement through the model does take place via predefined paths, where you can fly back and forth and always have the relative best view. So the user thinks that he navigates freely, but the system helps to a nice journey without getting lost. You also can point on the spots of interest to go there directly. Like mentioned above sometimes you do that by a video of the flight or a realtime movement within the 3d model.

Activities or content of any kind are either represented by video-icons, or 3d-models. Those will be placed in the virtual model according to its real location in the real region. If you choose such an icon, or object the content behind it will be started. This can either be a video, pictures, graphics, animations, sounds, etc.



Tab. 17, 18, 19: Examples for Video-Icons and 3D Models as Buttons (Irschitz,99)

### 4.3.1 Windows

There are two windows to show either the content or the 3d-model.

- The navigation window, what contains the 3d model of the region
- The Information window, that shows the content behind the chosen icon or object.

Both windows are always open and hover slightly overlapping over each other. You change window by simply pointing at it. The content of the respectively other window gets frozen and will be reactivated if picked again.



Tab. 20, 21: The dynamic info button ,The 2 windows configuration (Irschitz,99)

### 4.3.2 The dynamic Info button

If a video clip is shown in the content window, there is also shown a little interactive field called the dynamic info button in the lower right corner. Behind this you will find further info to the respectively shown picture or scene.

If touched, the video freezes and the button enlarges to a little screen that reveals the additional information to the actual scene. That means if the video goes on, the information behind the button changes according to the scene shown in the video. If you click in the video again the screen changes back to a button and the video goes on.

## 5 COMMUNICATION WITHIN THE SYSTEM

### 5.1 ROSI the systems help and patroness

ROSI is not just the name of the system, its also the name of a virtual character. She is the patroness of the system and guards, protects and helps its users. She will welcome the user with a friendly smile and will familiarize him with the system. She gives the technology the personal touch and makes it more human. She talks to the people with a smooth and comforting voice, she gives you explanations or can be your tourist guide. Her appearance will be always when she is most needed and provide assistance. ROSI has the face of a real person, that is filmed and mapped onto a sphere. So its simple but still efficient, humanoid but not human. So the character will win the sympathies of the user.

### 5.2 Virtual Characters life in the Virtual environment

Avatars are the digital image of the user, and will populate the virtual environment. The face of the user will be filmed by a camera and mapped in real-time on a sphere, like ROSI. So the virtual personality of any user that operates whatever info stand comes into being. You see your avatar from bird-perspective according to the momentary viewpoint. He follows the movement of the cursor, that means you can navigate him by finger and thus the movement through the virtual environment. If two or more avatars meet now in the system, they get enabled to contact each other and communicate. The system will allow a normal conversation like in the real world. You can ask questions, exchange experiences, get tips about the region or just chat with each other. Thus a new communication platform could arise, not just for tourists, no, for everybody who wants to dive into this parallel universe. You can compare the communication platform with a video conferencing system. The face of the conversational partners will be captured by video, the voice by microphone and on the other side played back by a projector and speakers.



Tab. 22, 23, 24: Virtual Characters and direct communication within the system (Irschitz,99)

### 5.3 Other inhabitants of the virtual region

In this region there could be a wide variety of different inhabitants (avatars). Each one could fulfil an other service to the user. So, there are different characters who could help the users to find things, to explain or guide, to make contacts, what ever. There are actually no limitations of the fantasy and creativity.

#### Feasibility

A feasibility study has been made for this 3D infosystem. Actually all necessary hardware-parts are developed in prototype or even available on the market now. Computing and graphics-power of hardware is at a sufficient level to create such a rich media info system. So the major effort would be the development of the 3D userinterface and its intuitive control. To guaranty a high quality realtime graphic combined with extensive media integration as movies, sounds, graphics, animation, avatars....., a high performance realtime engine is required (i.e. Java 3D, viZrt, virtools )

So the conclusion is: "The time is ready to build such a system"!

## 6 REFERENCES

- [[www.irschitz.com](http://www.irschitz.com)]
- [[www.irschitz.com/videos](http://www.irschitz.com/videos)]
- [<http://www.siggraph.org/s2003/conference/etech/peyote.html>]
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