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Internet as a Medium for Presentation of Fine Art and for Art Installations

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Abstract

In this paper, an overview of some advanced multimedia solutions is given which were developed in the Computer Vision Laboratory at University of Ljubljana and used in several art presentations and art installations on the Internet.

1 Introduction

Already in 1995 we presented on the Internet the Slovenian Virtual Gallery which was a typical first generation web multimedia presentation consisting of an interconnected set of texts, images, and video clips. An alternative way of exploring this set was by "walking" through a virtual gallery space. This multimedia concept, in combination with our module for video observation over the Internet, was later used by the video artist Srečo Dragan for several of his art-Internet installations. By adding the possibility to get real-time video from any physical point, which can be connected to the Internet, one can effectively blend actual and virtual spaces.

2 Slovenian Virtual Gallery

The Slovenian Virtual Gallery (SVG) was developed in the first half of 1995 with the goal to present Slovenian fine-art on the internet [4, 7]. In cooperation with distinguished slovenian art-historians we prepared an overview of Slovenian art from the gothic period up to the present day. SVG consists of three main parts (Fig. 1(a)):

1. Overviews of the main art historical periods which contain biographies of authors, each with an iconized index of their works (Fig. 1(b)). Icons can be blown up to the screen size (Fig. 1(c)).

2. Permanent collections and current exhibitions in selected Slovenian art galleries.

3. A 3D virtual gallery where the viewer can move through a virtual threedimensional architecture and view the paintings hung on the walls (Fig. 1(d)). By clicking on the paintings the user switches to the works and their authors in the first part of the SVG.

SVG supports also search of authors or works of art by using different keys (names, years, art techniques).

SVG, judged by its implementation, was a typical first generation web site. Due to the lack of appropriate tools at the time of development we wrote our own data management tools and tools for automatic generation of HTML documents, all implemented in PERL. Data was stored in files which were directly manipulated. Since there were just a few typical types of documents in the SVG, we used patterns to generate HTML documents. The administrator of the system whose role was to add new content to the SVG didn't need to know the HTML syntax. Additional features of the SVG system were a distributed database and remote management of the system. In the span of just a few years, however, the web related technology has experienced a tremendous growth. On the market is now available a range of relational and object-oriented data management systems which make such types of web applications much easier and faster to develop. We have in fact made a pilot re-implementation of SVG using a commercial object-relational data base. The most critical and potentially time consuming step in such re-implementation is the conversion of existing data to the new data structure.

The virtual exhibition space of the SVG was implemented using a structure of inter-connected clickable-maps. Each view of the 3D gallery space, which was initially constructed as a classical CAD model, was pre-rendered and converted to a clickable map by addition of carefully selected links to the next possible views. By clicking on the pre-selected areas of the clickable map the observer moves to the corresponding destination. Thus a selected sequence of such clickable maps forms a walk through the virtual
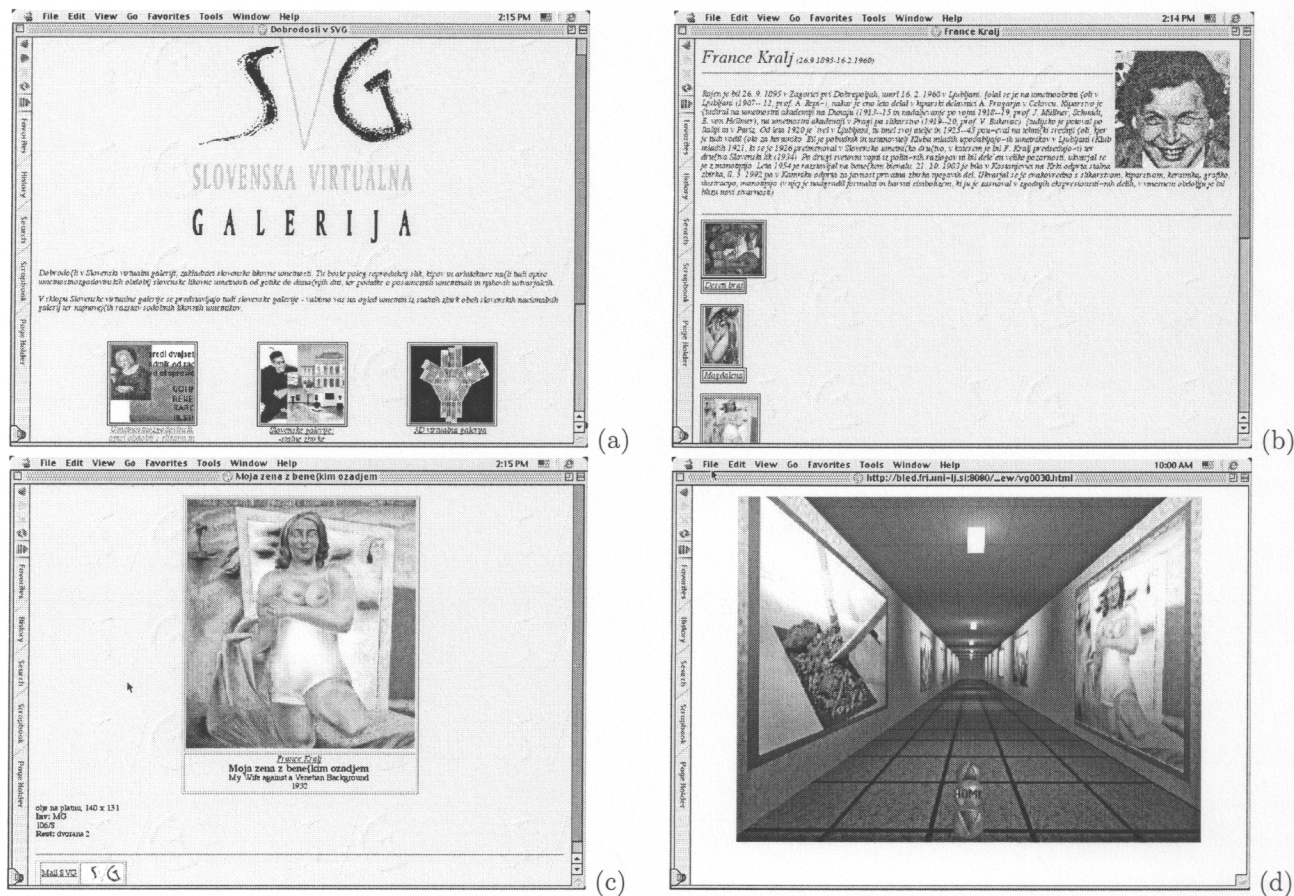
Figure 1: (a) Home page of the Slovenian Virtual Gallery showing its three main constituent parts, (b) Presentation of painter France Kralj, (c) "My wife against a Venetian background" by France Kralj (oil on canvas, 140×131 cm, 1932), (d) Inside the virtual gallery.

gallery. If a visitor of the virtual gallery clicks on any of the paintings which are hung on the walls he gets to the presentation of the paintings in the first part of the SVG. In this way all parts of SVG are interconnected. Although similar result can be obtained using a VRML model, our implementation was much faster at the time and enabled greater flexibility in connecting to different parts of SVG since each step in a walk was just a link to another HTML document. Such predetermined paths through a virtual space are also easier to handle for a novice user who can get quite easily lost if a multitude of options are open such as in a VRML rendered virtual space.

SVG was warmly received in Slovenia [3] and, as judged by a high number of visits, on the Internet in general. In 1996 the McKinley Group's online editorial team rated SVG as a "4-star" site excelling in "Depth of content", "Ease of Exploration", and "Net appeal". Unfortunately, no institution in Slovenia at that time showed any interest to maintain and upgrade the SVG system which was a result of student work and is therefore no longer maintained. While the first part of SVG is fairly content stable, the sec-

ond part was supposed to offer information on current exhibitions in several galleries.

Recently, the Union of the Slovene Fine Artists Associations (ZDSLU) sponsored a project which was inspired by SVG.
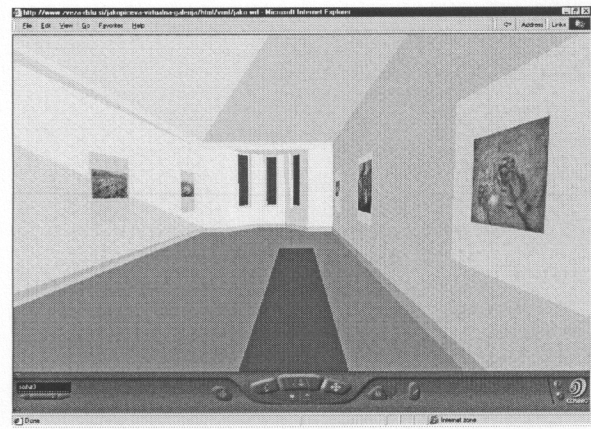

Figure 3: Jakopič's death mask

A VRML model of the Jakopič Pavilion, which was demolished in 1962, was built to serve as an environment for virtual exhibitions of Slovenian artists on the Internet and to celebrate the anniversary of Rihard Jakopič [11] (Fig. 2). Rihard Jakopič was the premier Slovenian impressionist painter who in 1908 actually
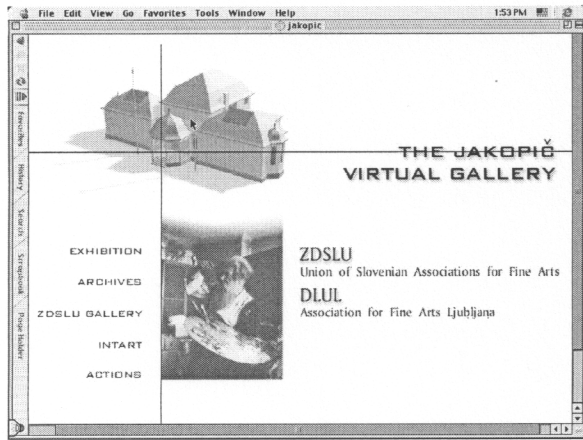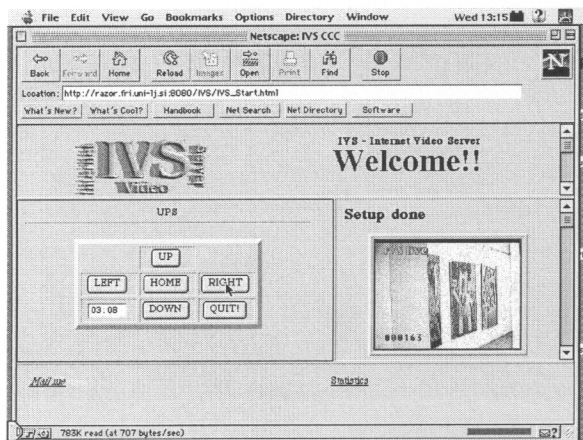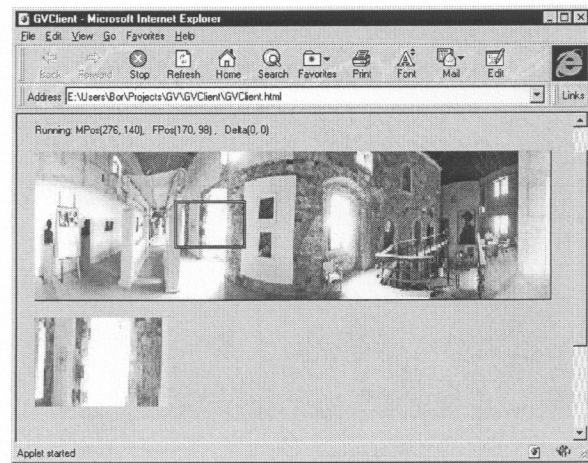
Figure 2: (a) Home page of the Jakopič Virtual Gallery, (b) VRML model of one of the rooms

Figure 4: (a) old Internet Video Server interface, (b) new "GlobalView" interface

financed the building of the pavilion in Ljubljana. In the virtual pavilion, which closely follows the original plans of the architect Maks Fabiani, is included also a 3D model of Jakopič's death mask which we rendered using a structured light range sensor (Fig. 3).

3 Life video over the Internet

Life video transmission over the Internet is becoming more widespread as the capacity of the networks expands and the access speed of the end users increases. At this moment thousands of cameras, all across the earth, are sending images to web sites which can be used as our remote eyes. In 1996 we developed our own system for remote video observation over the Internet that we named Internet Video Server (IVS) [6]. The IVS system consists of a camera mounted on a robot pan/tilt manipulator which makes possible to turn the camera in any direction. The user of the IVS system observes the video image and controls the direction of the camera in a browser window shown in Fig. 4(a).

This interface required the user to press the left/right and up/down buttons to move the camera. Due to buffering, slow, and uneven reaction times of the network these controls did not seem to be very predictable from the user's point of view. The reaction time of the system depended mostly on how the camera and the pan/tilt unit was connected to the Internet. Many types of connections were tested, ranging from direct computer network connections to GSM networks. The user could easily loose any sense of where the camera was pointing to, especially if he or she was not familiar with the location where the camera was placed.

These interface problems motivated us to design a better user interface for remote video observation [6]. Due to the precisely controlled position of the camera by means of the pan/tilt unit, individual images acquired by IVS can be assembled into a panoramic 360^0 view of the surroundings (Fig. 5). This panoramic image is then used as a backdrop for the live video image, to give the user the correct con-

Figure 5: 360^0 panoramic image taken in the ZDSLU gallery during the exhibition of Silvester Plotajs Sicoe.

text for his observation. In the new "GlobalView" interface (Fig. 4(b)) one can simply drag the live video frame over the static panoramic image to define the new camera position.

Figure 6: "Chair for van Gogh" by Silvester Plotajs Sicoe (oil on jute, 100 × 180 cm, 1997)

This system for live video transmission over the Internet was used in June 1997 during the exhibition of the painter Silvester Plotajs Sicoe in the Gallery of Union of the Slovene Fine Artists Associations in Ljubljana. On the static panoramic images, taken in each room of the gallery (Fig. 5), one could click on paintings to get the corresponding pre-scanned images of these paintings and other information about the painter (Fig. 6). From the current position of the camera platform, however, a web user could receive live video as well as control the camera to observe not only the sterile static exhibition, but also the visitors moving through the gallery.

4   Art-Internet projects

While the efforts of Computer Vision Laboratory in promoting Slovenian fine art over the Internet did not receive any institutional support, a very stimulating and fruitful collaboration started with the new-

media artist Srečo Dragan. Dragan is one of the pioneers of video art and conceptual art in Slovenia. He was eager to explore and use any new technological solutions which related to his artistic interests. Our multimedia experience, in combination with our module for active Internet video observation, was used in several of Dragan's art-Internet projects and installations [8, 9, 10] (Fig. 7). These projects offered, in general, the visitor a blend of actual and virtual spaces which could be visited over the Internet. Visitors on the web could control the view direction of the camera to interactively observe actual physical locations which were again in an inventive hypertextural fashion connected to other virtual spaces or other visual or textural information.

Figure 8: Web project ROTAS–TENET

The first joint interactive Internet installation ROTAS–TENET was entirely dedicated to the architect Jože Plečnik (1872–1957) and his exhibition "Architecture for the New Democracy" at the Hradčany castle in Prague (Fig. 8). During the opening ceremony on Hradčany the IVS camera was set up on the
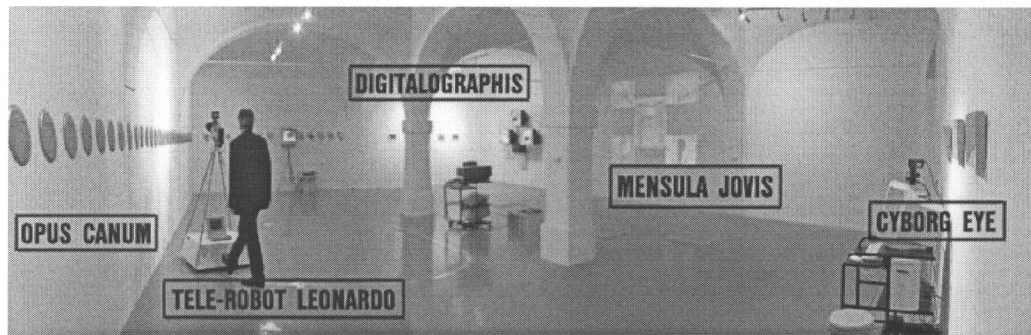
Figure 7: Exhibition of Srečo Dragan's electronic art projects in gallery Equrna in 1997
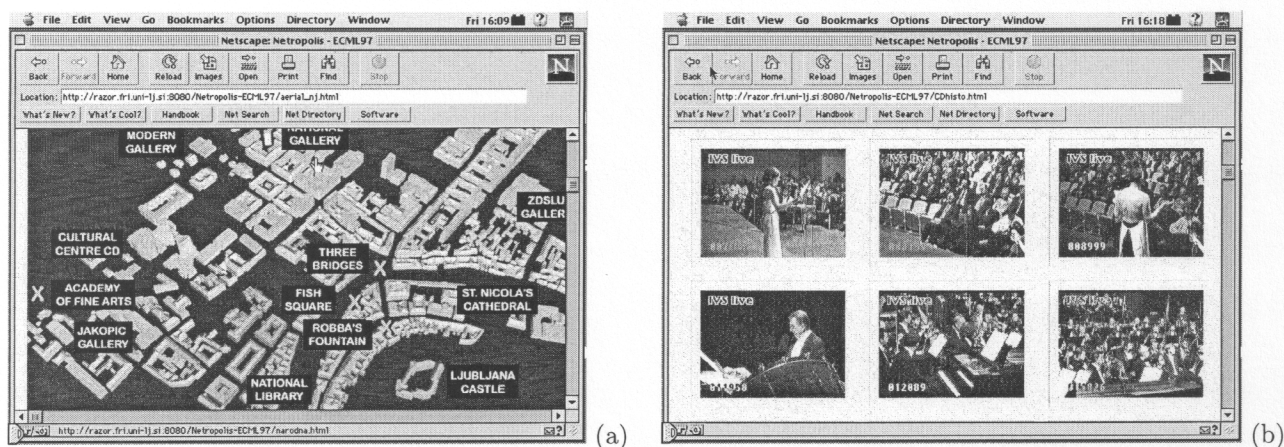

Figure 9: Netropolis–Cyborg's Eye project: (a) 3D model of the center of Ljubljana with locations indicating where panoramic images can be interactively viewed, (b) video frames transmitted through IVS from the opening ceremony.

Prešeren square next to the Three Bridges, a demonstration of Plečnik's mastery in urban development, to spiritually link Ljubljana and Prague by new technological means. In the web site was included also a computer model of Plečnik's plan for a new Slovenian Parlament which was never realized. This event in May 1996 marked also the first occasion when life video from a public space in Slovenia was available on the Internet.

The two most important and complex joint art-Internet projects were Netropolis–Cyborg's Eye and Netropolis–Clavis Urbis.

4.1 Netropolis–Cyborg's Eye

The Netropolis–Cyborg's Eye project was prepared for the European month of culture in Ljubljana (ECML) in the period of 15 May – 5 July 1997 [1, 2]. The project was dedicated to artistic research and experiment and was supposed to serve as a reference point which enables art to enter the third millennium. The project was realized as an interactive installation of telepresence on the Internet which has at various locations and at different times connected Ljubljana with the world. The project was a combination of a navigable virtual architectural space, representing Ljubljana on the Internet—NETROPOLIS (Fig. 9 (a))—and of live video images, sent by means of a camera that could be controlled over the Internet from the selected points in the city—CYBORG'S EYE (Fig. 9 (b)). At these points one can cross from the (live or recorded) video images over into the digital city model and back again. At selected locations in the city 360° panoramic pictures were recorded which can be viewed interactively. The conceptual plan of an interactive access from one space to another is only possible as a view from the utopian site, a non-existent, excluded point of view, which is the center of all actual and virtual plans of space and time. Additionally, images of other ECML events were digitized from video clips prepared by TV Slovenia and presented in the Chronicle section of the project web page. Unlimited possibilities of interactive dialogue formed a temporal image of the whole event which is still available on the Internet [8]. Clavis Urbis was a later "reimplementation" of the same project but in the town of Slovenj Gradec.

4.2 Netropolis–Clavis Urbis

Netropolis–Clavis Urbis was the title of Srečo Dragan's participation at the U3, 2nd Triennale of Contemporary Slovene Art in Modern Gallery Ljubljana, 14 November – 11 January 1998. The participants were selected by the curator Peter Weibel.

Netropolis-Clavis Urbis is based on a camera carrying robot telecontrolled via the Internet (Fig. 10). The robot [5] can be directed via the Internet to several locations in Ljubljana, represented in the gallery space by anamorfic images; at the same time, it sends a picture of the actual gallery space to the spectator-actor. But when the camera settles on the picture of the selected direction, the image on the screen transforms into a virtual, computerized picture of the city. The project thus connects the real gallery space with both the real and virtual spaces of the city of Ljubljana and with the dislocated word of computer networks [12].

Figure 10: Srečo Dragan's exhibition at U3, Modern Gallery Ljubljana 1998

5 Conclusions

We have built several art-related web sites, ranging from "classical" presentations of picture galleries to interactive art installations in cooperation with the media artist Srečo Dragan.

If a gallery or art museum web site serves only the general public, short information about collections, some pictures, opening hours, and directions for finding the museum generally suffice. If, on the other hand, a museum web site wants to serve also the art specialists, almost complete collections should be available, together with all other relevant information. This is of course a major, several years long undertaking, which must be carefully planed and is best organized in the framework of digitazing the collection also in high resolution for other purposes. The accompanying web design must be more conservative with the primary goal of finding the relevant information fast.

Web sites devoted to exhibitions of single authors or even art-Internet installations are much less restrictive in design as well as in technological solutions since they are much smaller by content and usually short lived.

From the human resources point of view, new educational programs are sorely needed to combine the knowledge of technology with design skills.

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