Chapter XIX

VRML-Based System for a Three-Dimensional Virtual Museum

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A Virtual Reality Modeling Language (VRML)-based interactive three dimensional museum on the Web is designed and implemented. Users may walk through a 3D representation of the whole museum, viewing its collections, and seeing objects in 3D together with information about them. To allow all of these, we have designed a set of interactive dynamic Web pages, using a client-server platform that delivers the information required by the user, both 3D data of the objects and texts and 2D information. All this information is stored in a database to enable easier access and management.

INTRODUCTION

In the last few years, because of the increasing growth of the Internet, general-purpose clients have achieved a high level of popularity for static consultation of text and pictures. This is the case of World Wide Web (WWW). Using a hypertext system, Web users can select and read information from all around the world on their computers , with no other requirement than an Internet connection and a navigation program.

The information available on Internet has been, and still is, series of written texts and 2D pictures (i.e., static information). This sort of information suits many publications, but it is still highly unsatisfactory for others, like those related to objects of art, where real volume, and interactivity with the user are of great importance. Here, the possibility of including 3D information in Web pages makes real sense.

As we become an increasingly visual society, a way to maintain patronage is to adapt museums to new times. The possibility of not only visiting and knowing the museums nearby but also enabling anybody to visit the building from their homes could be enabled. This would imply the incorporation of the virtual reality (Isdale, 1993), although today few

museums allow this kind of visit via the Internet. In virtual reality, human actions and experiences that interact with the real world are emulated although, obviously, with some limitations. With virtual reality, the user could walk, examine and interact with the environment, in contrast to traditional media like television that present excellent graphics but lack interactivity. Although this is not a new idea, it is achieving a wider expression due to the availability of Virtual Reality Modeling Language (VRML) (Hartman & Wernecke, 1996), a widespread language for the description of 3D scenes and WWW hyperlinks (an analogy of the HTML for virtual reality).

VRML allows us to see a 3D artifact from any angle and perspective, to turn it in any way, and so on. In sum, we can manipulate it – something generally forbidden in a real museum.

This chapter deals with the design of a system that allows this interactive Web access to works of art in 3D, as a step in a research project dealing with the design and implementation of a virtual and interactive museum in 3D on the Web. The Museum of Valladolid will be presented as implementation of the proposed system. Users may walk through a three-dimensional (3D) representation of the whole Museum, viewing its collections, and seeing objects in 3D together with information about them. To allow all this, we have designed a set of interactive dynamic Web pages (Díez-Higuera & Díaz-Pernas, 1999), using a client-server platform that delivers the information required by the user, both 3D data of the objects and texts and 2D information. All this information is stored in a database to enable easier access and management.

We will describe the worlds we have created, how the user can interact with them in order to pass from a world to another, and how to get information on each 3D artifact. Next, after a brief description of each world, some frames will be presented from a simulation that will allow us to see some of the possibilities that these virtual worlds can offer.

This chapter has the following structure: the next section presents the traditional approach museums have adopted to be on the Web, with some sample sites; section following the *Web Site Review* describes the virtual museum and the advanced techniques used for implementing it; the *User Interface* section shows the user interface designed for the Museum of Valladolid; and the last section concludes this chapter with discussion.

WEB SITE REVIEW

Several museums around the world are already committed to a strong Web presence and many others will adopt one very soon. Dynamic museum leaders understood that the increasing number of Internauts requires special attention from museums. Internet and CD-ROMs represent new media that will challenge museum communication strategies.

According to Proença, Brito, Ramalho and Regalo (1998), "Two distinct Web approaches are being adopted by the museums. Some regard their presence on the Web as another way to publicize the museum and to promote their activities; others use the Web as a powerful resource to achieve their purposes: to conserve, to study and to display."

The most common attitude is to consider the Web as a simple sum of the different kinds of information already in use by museums – specially printed information – but gathered in a globally structured way. These data include a museum description and a list of activities and collections, where a typical Web page structure contains: collections and exhibitions, visit planning and conditions, new acquisitions, projects and activities, museum organizational scheme and educational programs.

Several museums on the Web follow this approach. They may not be the sites that most museums would like to have, but they made an effort to use the available resources. Among

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