

V I R T U A L
R E A L I T Y
X P L O R E R

Virtual Reality Xplorer

The authoring system to create 360 degree views in MS Windows

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Introduction

Images are the most accessible and universal media that instructors, authors and developers can use. Vivid and interesting interfaces are what users and readers demand when they sit down in front of a CBT module or click on a link in a web page. From boardrooms to classrooms, solutions that add graphical sophistication to presentations and applications are in demand. *VRXplorer (VRX)* is such a tool. The user can create 360 degree views with a simple drag and drop procedure. Readers can, in a sense, be transported and look around at the scenes easily created for them. Objects can be viewed from all sides, bottom and top.

Developed entirely using *Multimedia ToolBook 3.0*, the visual power of *VRXplorer* is enhanced by employing transparent viewers that enable the reader to evoke, with a single click of the mouse, audio or video files and other applications. *VRX's* flexibility provides opportunities in many fields of application in either education or business. This paper will present some of the basic issues behind *VRX*, including the use of this technology as a front end for Internet-based applications.

Creating Virtual Views

VRX software is based on the concept that a 360 degree view can be reproduced by putting together 8 different images, each one shot horizontally at the same elevation every 45 degrees in a circle. Images above and below the horizon can also be shown with images shot at the same view angle but at different height levels. *VRX* is used to represent the original point of view by properly positioning the images on a 2D array.

Creating virtual views using *VRX* requires that the images be previously captured (using a video card or scanner) and that their file formats be accessible on hard/floppy disk or CD. Through a simple drag & drop operation from the file list of *VRX Author*, the pictures are inserted into an 8x4 stage array and collected together in a user-defined working directory. Each image can be easily moved, replaced or deleted from inside the array, and can be associated with a general descriptive caption.

An important feature that gives *VRX* more flexibility is hotspots. Hotspots are mouse-sensitive areas that can be defined on top of the pictures and that can be linked either to a caption or *ToolBook* statement. Hotspots can also be associated to new images, sounds, movies or other *VRX* views, enhancing the level of user interactivity and allowing a kind of cybernavigation in the virtual space.

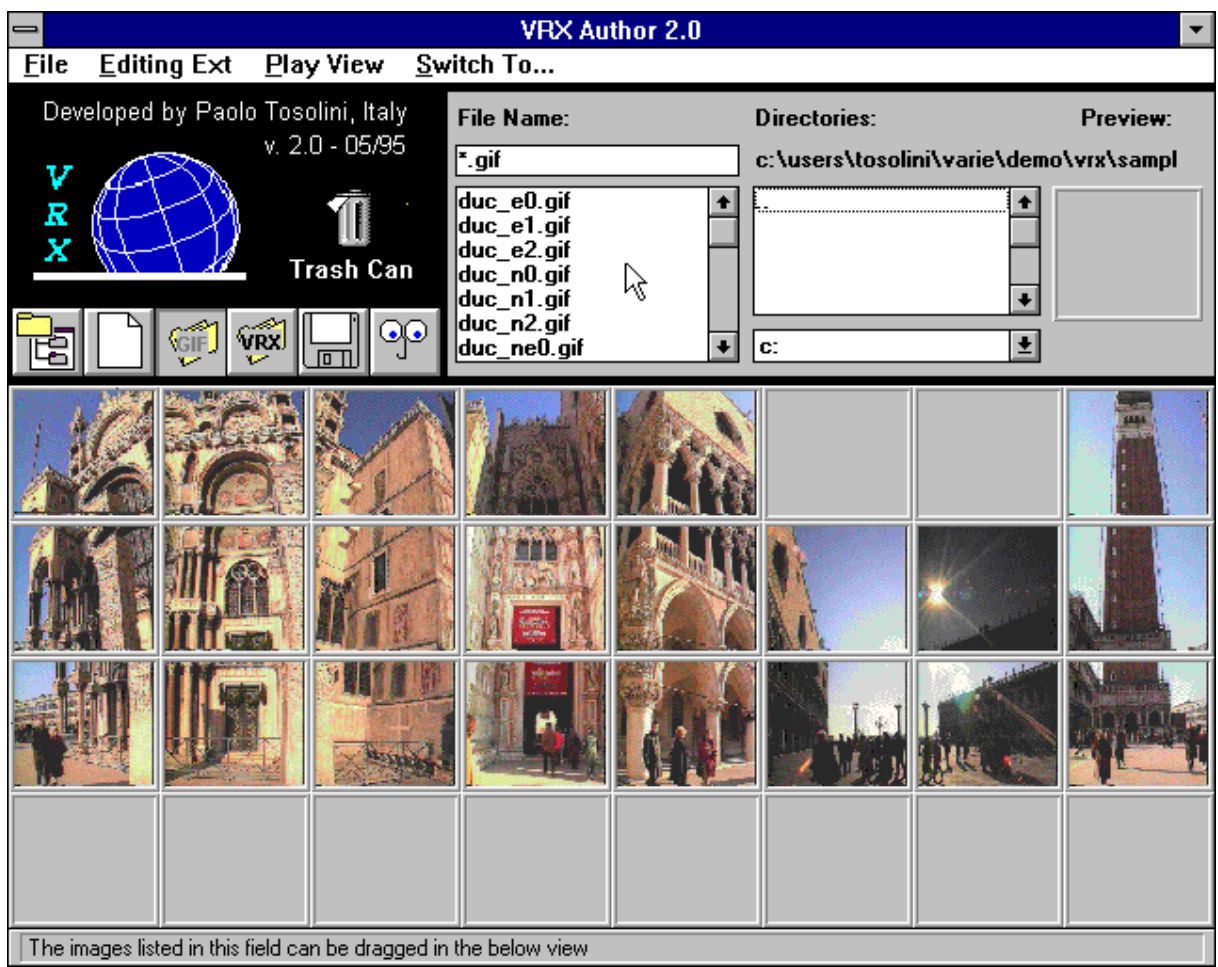


Figure 1: A VRX view ready to be played.

Once virtual views have been composed and saved to disk using *VRX Author*, they can be displayed through *VRX Player*. The *VRX Player* is a separate software module that by showing one picture at time, can pan the original view in the direction requested by the user.



Figure 2: The VRX Player incorporated in a virtual visit demo of Venice.

VRX and the Internet

Virtual views can represent a metaphor to browse information on the Internet, too. Linking hotspots to *MultiMedia WWW PC*¹ functions, it is possible to associate WWW addresses (URLs) to objects displayed in *VRX* views. Furthermore, bi-directional communication between the WWW browser and a *ToolBook* instance can be achieved by implementing *W³ Kiosk*² extensions. As a final result, the user who clicks on an HTML keyword obtains a specific *VRX* view angle in the *ToolBook* application.

Southern Illinois University at Carbondale (SIUC) Department of Library Affairs is incorporating these technologies in the development of a prototype "virtual guide" of Morris Library. The project, called *The Cybrary*³, allows students access to basic textual information using the WWW, but they are also able to get visual details on book locations and other library sources through a virtual representation of the different floors.

¹*MultiMedia WWW PC* consists of a function library that allow a Toolbook application to interact with the World Wide Web, to retrieve/connect to an URL, print an HTML page and more. Full details available at: <http://www.lib.siu.edu/mmwwwpc/mmwwwpc.html>

²*W³ Kiosk* is a software that acts as a ghost agent between the Web browser and a running Toolbook instance. Through the use of special HTML tags, it is possible to send commands to a Toolbook application clicking with the mouse on a Web document. Full details available at: <http://www.lib.siu.edu/w3kiosk/w3kiosk.html>

³More information on the Cybrary available contacting Susan Logue, head of Digital Imaging, Library Affairs at SIUC: slogue@lib.siu.edu

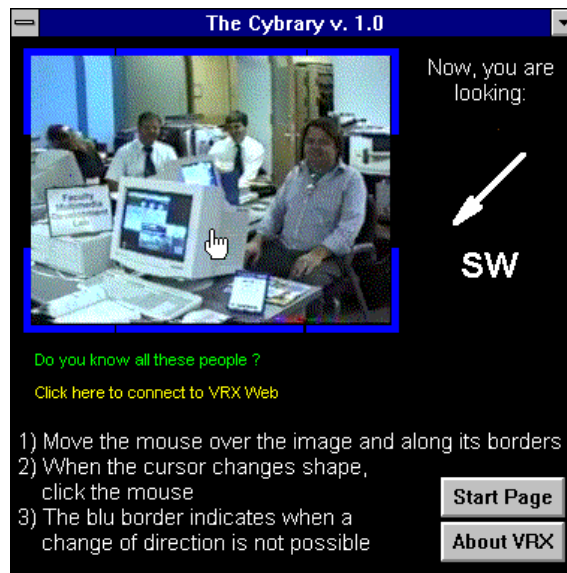


Figure 3: In the Cybrary project, VRX views represent a metaphor to browse the Internet, too.

Future Directions

The encouraging results of the *VRX* research suggest that pursuing the investigation of virtual views will reap rewards in both areas of human computer interaction and networking. The next step in this direction will be the implementation of *VRX* software in time-based scenarios⁴. The second step will consist of pushing the limits of the *ToolBook*-Internet relationship by developing documents with the ability to update their content through the WWW. Industry, as well as academia, will reap many benefits as a result from this research activity.

WWW based kiosks that use *ToolBook* as an advanced viewer of multimedia information may find extensive application either in educational (i.e., virtual museums, and CBT) or business fields (i.e., real estate agencies, tourist points of interest, and electronic catalogues).

Where to find VRX

VRX software is available via Internet at the following addresses:

<http://www.lib.siu.edu/vrx/vrx.html> (USA site)

<http://www.ets.bris.ac.uk/tosolini/vrx/> (European mirror)

<http://www.indesia.iunet.it/vrx/> (VRX commercial site)

<ftp://oak.oakland.edu/SimTel/win3/multimed/vrx20.zip> (FTP site)

⁴See Shinjuku Guide application at <http://www.lib.siu.edu/shinjuku/shinjuku.html>

Bibliography

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Norman A. Donald, 1988, *The Psychology of everyday things*, Basic Books Inc., NY

Macken Kevin, Randall Ken and Tosolini Paolo, 1995, *CAL and SuperCAL: Interactive Courseware for the Internet*, Workshop on Computer Aided Learning, CAL '95, Cambridge, UK - SuperCAL is available on the Internet at the address: <http://www.staffs.ac.uk/supercal/supercal.htm>

Tosolini Paolo, 1995, *MultiMedia WWW PC: How to distribute interactive applications on the Internet*, Workshop on WWW based Online Kiosks Systems, Third International WWW Conference '95, Darmstadt, Germany - Technical report and application available on the Internet at the address: <http://www.lib.siu.edu/mmwwwpc/mmwwwpc.html>

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About the Author

Paolo Tosolini is a freelance multimedia developer. His research activity challenges the fields of user interface design and the publishing of multimedia documents on the Internet. He is currently visiting researcher at Southern Illinois University at Carbondale.



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