



An exciting cross between video and virtual reality, QuickTime Virtual Reality allows you to examine real life worlds like you were really there

You are searching the Web for a nice place to visit for a holiday. How do you select the place you should visit? Each place you look up information on proclaims itself to be the best and the most scenic. So how do you really check if the place is worth visiting? You could look for photographs of the place, but the pictures on the Web site could be filtered to show you only the best. The same could be done to the videos of the place.

Perhaps you need to try a QuickTime

Virtual Reality or QTVR movie.

A QTVR movie is very different from a conventional movie or video file. Most importantly, it is not a movie at all; it is a 'still' image of a scene or an object (made out of a series of still images) but you have the choice of what angle or zoom setting you want to see it at. This offers you the freedom to look around as you would when actually exploring the place.

There are two types of QTVR movies: panoramic and object movies.

A QTVR panorama movie can, at simplest, be described as a 360-degree still image shaped like a cylinder, and viewed from the inside of this cylinder.

The Development Cycle

QuickTime is basically a Macintosh product and though the QuickTime runtime system is available for both Windows and the Macintosh, Apple does not have an equivalent of the QuickTime VR authoring kit for Windows.

A QTVR movie starts life as a

series of photographs taken from a single location, but at varying angles. These photographs are usually taken from a camera mounted on a tripod and centred on its lens. The camera is rotated a little after every shot, such that every photograph has some area overlapping with the next one—the more the overlap, the better. The images obtained are passed on to the Stitcher module of the QTVR Authoring Kit, which stitches these images together into a vertically aligned cylindrical image. The resultant image is stored as a normal image file. This image if viewed with an image viewer will appear distorted, but will be clearly recognisable.

An 'object' movie is created in the same way, except that the camera here is stationary while the object being photographed is rotated instead. The background of the object is usually a solid colour (very often, black), so that the final movie has the effect of holding the object in one hand and examining it by turning it around. In some cases where the object is immobile, the camera is taken around it instead. And in this situation you need not be particular about the background.

A digital camera is usually a better choice than a normal camera since it does not need processing and scanning of the photographs, thus cutting down on the time spent in obtaining the base images.

Tailored to fit

Most cameras tend to vary in image proportion from the centre to the edges of the photograph. The Stitcher module however is capable of handling such

Tools used to create QuickTime VR movies

HyperCard: A multimedia authoring language.

Image Mask: An overlay image similar to a transparent layer (like in an image editing program such as Photoshop), which displays where the hot spots exist on the image, or how the image appears on the screen.

Macintosh Programmer's Workshop: A software development environment, required for writing scripts for Stitcher.

Make QTVR Object: A free utility from Apple that creates QTVR object movies from linear QuickTime movies.

Make QTVR Panorama: Another free utility from

Apple that creates QTVR panorama movies from linear QuickTime movies.

Nodester: A QTVR authoring program for the Mac from Picture Works.

PhotoVista: Another QTVR authoring program from Panimation.

Sanity SaVR: A free utility from Apple that provides a graphical interface to Stitcher.

Scene Editor: A HyperCard-based program to link a set of panoramics to each other, so as to form a scene.

Spin Panorama: Yet another QTVR authoring program from Live Picture.

problems when merging the images: the result it produces is seamless—with no hint of the scene having been composed of a dozen images or more. The flat image file produced can be touched up using any image editing application, if necessary.

This is also the time when 'hot spots' are defined. A hot spot in a QTVR movie is defined in an image mask as a patch of solid colour over the area that needs to be converted into a hot spot. A patch of a different colour indicates a different hot spot. Although this is a very cumbersome way of marking hot spots, it is also efficient since it allows pixel-level adjustments and some dramatic effects, like making everything but the hot spot object disappear when clicked.

The image mask file is merged into the QTVR movie further down the development process. It does not appear on screen anytime, but the QTVR viewer constantly checks with it even as you move your mouse.

A single VR scene where all you do is look around is not much fun. Moving between locations is important too. QTVR supports that; locations are called nodes and are defined in the same way as hot spots. Clicking on a node hotspot takes you to a different panoramic. A node link also needs to decide what part of the panoramic the user sees by default; else you could click on the door leading out of a room, and the next scene could open with you facing the door back into the room again.

Most QuickTime VR movies are either found embedded in Web pages, or in multimedia productions as part of an existing framework. In the latter case, the QTVR movies are accompanied by text, sound, graphics or also normal (linear) QuickTime movies. To synchronise these other components and events, a special interface with the QTVR movie is required. QuickTime provides these through a set of external commands (XCMDs). XCMDs enable developers to access QTVR movies from within Director or HyperCard, scale them to a particular size (most multimedia CD-ROM titles play movies at a resolution of 320 x 200 pixels), and display a specific part of the movie at a specific zoom setting. Since QTVR is part of QuickTime, a developer will find working with QTVR movies similar to working with normal QuickTime movies.

The QTVR system also can fire events; it can send messages back to its parent process, the multimedia interface, when specific events occur. The parent process can then use this event for whatever needs to be done, like playing a sound file or displaying some information.

End sequence

Since its inception in 1991, QuickTime VR has come a long way. Defying convention and surviving competition from even Microsoft's Surround Video, it has become the standard for viewing interactive movies on the Web.

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WEB SITES THAT USE QTVR

www.pathfinder.com/time/reports/space/johnson.html

www.earthsci.carleton.ca/paleo/1998_2/toc.htm

www.reebok.com/training/

www.studio360.com/lostcities.htm

www.studio360.com/tikal.htm

www.worldmedia.fr/witness/virtualvisitor.com

www.titanicmovie.com/past/tour_index.html

www.bmwusa.com/

<http://lifftoff.msfc.nasa.gov/vr/vr.html>