

3D internet with 3D Searching

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Abstract: 3D Internet also known as virtual worlds is a powerful new way for you to reach consumers, business customers, co-workers, partners, and students. It combines the immediacy of television, the versatile content of the Web, and the relationship-building strengths of social networking sites like *Facebook*. Yet unlike the passive experience of television, the 3D Internet is inherently interactive and engaging. Virtual worlds provide immersive 3D experiences that replicate (and in some cases exceed) real life.

Advances in computing power combined with interactive modeling software, which lets users create images as queries for searches, have made 3Dsearch technology possible.

However, researchers at universities such as Purdue and Princeton have begun developing search engines that can mine catalogs of 3D objects, such as airplane parts, by looking for physical, not textual, attributes. Users formulate a query by using a drawing application to sketch what they are looking for or by selecting a similar object from a catalog of images. The search engine then finds the items they want.

So, the concept of 3D internet is possible with the use of 3D searching.

INTRODUCTION

University of Tokyo's TWISTER 360-degree rotating 3D display



Figure 1

TWISTER (Telexistence Wide-angle Immersive Stereoscope) is an immersive full-color auto stereoscopic display, designed for a face-to-face telecommunication system called 'mutual telexistence', where people in distant locations can communicate as if they were in the same virtual three dimensional space.

Researchers from the University of Tokyo, led by Susumu Tachi, have developed a unique display that allows viewers to be immersed in a 3D video environment.



Figure: 2

University of California's StarCAVE Virtual World

The StarCAVE at the University of California, San Diego is a virtual-reality environment which allows groups of scientists to explore worlds as big as the cosmos and as small as Nano particles.

This 360-degree VR room offers a fully immersive 3-D experience:

Users of this virtual reality can interact with the visuals on the 360-degree display by pointing a "wand" which results in flying through the 3-D images and zoom in or out. The exact position of the wand and the user is determined by a multi-camera wireless tracking system.

A 3D mouse lets you move effortlessly in all dimensions. Move the 3D mouse controller cap to zoom, pan and rotate simultaneously. The 3D mouse is a virtual extension of your body - and the ideal way to navigate virtual worlds like *Second Life*.

The Space Navigator is designed for precise control over 3D objects in virtual worlds. Move, fly and build effortlessly without having to think about keyboard commands, which makes the experience more lifelike.



Figure: 3

Controlling your avatar with this 3D mouse is fluid and effortless. Walk or fly spontaneously, with ease. In fly cam mode you just move the cap in all directions to fly over the landscape and through the virtual world.

Methodology used involves the following steps for 3D searching

1. Query formulation
2. Search process

Query Formulation:

True 3D search systems offer two principal ways to formulate a query: Users can select objects from a catalog of images based on product groupings, such as gears or sofas; or they can utilize a drawing program to create a picture of the object they are looking for. for example, Princeton's 3D search engine uses an application to let users draw a 2D or 3D of the object they want to find. The above picture shows the query interface of a 3D search system.

Search Process:

The 3D-search system uses algorithms to convert the selected or drawn image-based query into a mathematical model that describes the features of the object being sought. This converts drawings and objects into a form that computers can work with. The search system then compares the mathematical description of the drawn or selected object to those of 3D objects stored in a database, looking for similarities in the described features.

The key to the way computer programs look for 3D objects is the voxel (volume pixel). A voxel is a set of graphical data-such as position, color, and density-that defines the smallest cubeshaped building block of a 3D image. Computers can display 3D images only in two dimensions. To do this, 3D rendering software takes an object and slices it into 2D cross sections. The cross sections consist of pixels (picture elements), which are single points in a 2D image. To render the 3D image on a 2D screen, the computer determines how to display the 2D cross sections stacked on top of each other, using the applicable interpixel and interslice distances to position them properly. The computer interpolates data to fill in interslice gaps and create a solid image.

HANDS ON: EXIT REALITY

The idea behind ExitReality is that when browsing the web in the old-n-busted 2D version you're undoubtedly using now, you can hit a button to magically transform the site into a 3D environment that you can walk around in and virtually socialize with other users visiting the same site. This shares many of the same goals as Google's Lively (which, so far, doesn't seem so lively), though Exit Reality is admittedly attempting a few other tricks.

Installation is performed via an executable file which places ExitReality shortcuts in Quick Launch and on the desktop, but somehow forgets to add the necessary ExitReality button to *Firefox's toolbar*. After adding the button manually and repeatedly being told our current version was out of date, we were ready to 3D-ify some websites and see just how much of reality we could leave in two-dimensional dust.

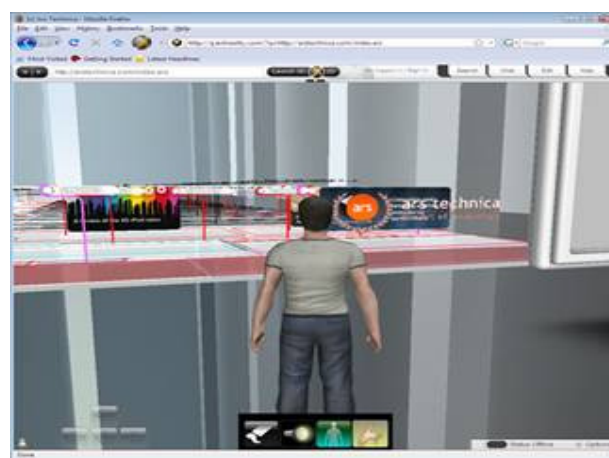


Figure: 4

Exit Reality is designed to offer different kinds of 3D environments that center around spacious rooms that users can explore and customize, but it can also turn some sites like Flickr into virtual museums, hanging photos on virtual walls and halls. Strangely, it's treating Arcs Technical as an image gallery and presenting it as a malformed *3D gallery*.

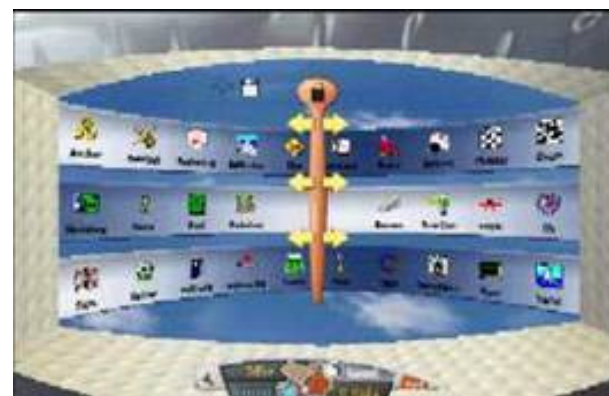


Figure: 5

3D Shopping is the most effective way to shop online. 3DInternet dedicated years of research and development and has developed the worlds' first fully functional, interactive and collaborative shopping mall where online users can use our 3DInternet's Hyper-Reality technology to navigate and

immerse themselves in a Virtual Shopping Environment. Unlike real life, you won't get tired running around a mall looking for that perfect gift. you won't have to worry about your kids getting lost in the crowd; and you can finally say goodbye to waiting in long lines to check out.

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