_knowscape, a 3D multi-user experimental web browser

[http://knowscape.fabric.ch/knowscape/]

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Introduction

knowscape builds new networked communities of knowledge. It explores original forms of online [user's] representation and builds new kinds of virtual world that carry on information.

knowscape is an experimental 3D browser that let users browse online content, create 3D information environment and share it [or not] with other connected users thank to its multi-user mode. Each user has a subjective 3D world, which belongs to a shared global world, and his own avatar [IP address or GSM number]. The main idea behind _knowscape_ is to build virtual spaces and avatars made out of users *browsing choices*

The technology

knowscape, which is based on our own multi-user system _rhizoreality.mu V2.5_[1], demonstrates the ability for a user to modify a 3D shared world. _rhizoreality.mu_ has also been used in our _La_Fabrique_[2] project and will be used as well for our _electroscape.org_ site that will be presented in this year's Siggraph Art Gallery. In its very last version, _rhizoreality.mu V2.6a_ is able to handle arriving connection through TCP/IP as well as through UDP/IP using a circular distribution system [CDS]. Both protocols can be available at the same time. For web clients, it is possible to have a JAVA based client as well as shockwave based clients. 3D shared world can be modelled by using VRML or Shockwave 3D or even both at same time. This flexibility permits to face a large set of different needs and applications.

knowscape functionalities

1. Persistence: _knowscape_ can be modified globally, by adding new 3D objects permanently to the virtual world. Even if the user who added these objects leave the world, his modifications will stay visible and available for other or new users. This feature implies the management of persistence at the server level. The current state of the _knowscape_ world is handled server side, making possible to modify which multi-user client is receiving what 3D data. It makes possible the delivering of subjective content very easily. The final user is then able to perceive the shared 3D world from its own perspective, making its experience very unique, while being still connected with other users.

2. From HTML to VRML: The conversion from HTML to VRML is a standalone service independent from the multi-user application. It is invoked by the multi-user server according to user's requests. The converter gets the HTML pages, analyses them and generates a VRML world. Then the resulting 3D scene is communicated back to the multi-user server that dispatches it to the right user. This solution avoids overloading the computer of the end-user with some low-level network tasks as well as going around security problems link to the Web context. The translator service makes first the HTTP/GET request to download the URL, then translates the content in *true* XML. This XML document is analysed with a DOM [Document Object Model] interface which dynamically access the structure of the page and generates a VRML world according to a set of rules based on a matching of different tags [name, attributes and values] and their 3D objects equivalents.

3. Real time avatar modification: Web site addresses visited by a user within _knowscape_ are becoming a part of its avatar. Every new Web address is added to the user avatar (as clickable 3D text *satellites*). All users are aware about Web sites visited by other users just by seeing their avatars. They can decide to visit the same site on their own as well as to switch their 3D world to this particular user's view in order to see what this Web site is talking about. At any time, the user can switch back to its subjective view in order to continue to browse the Web on its side.

In it's present state [conceptware], knowscape only supports/works with *pure* html/dhtml web pages containing no *JavaScript redirections* [ex. http://www.epfl.ch]

Extensions

rhizoreality.mu and _html2vrml_ are both parts of a metasystem in charge of managing heterogeneous services. This metasystem called _noosystem_ has to maintain a precise image of available services at any time. Through _noosystem_, each application / service can be aware of other applications / services by declaring itself to the metasystem. It makes possible for a given application to deal with a task for which it was not programmed by finding an available service that knows how to perform this given task. From the end-user point of view, this is made seamlessly without having to invoke manually several applications. Applied to _knowscape_ project, the conversion of HTML pages in VRML format is transparent for the end user.
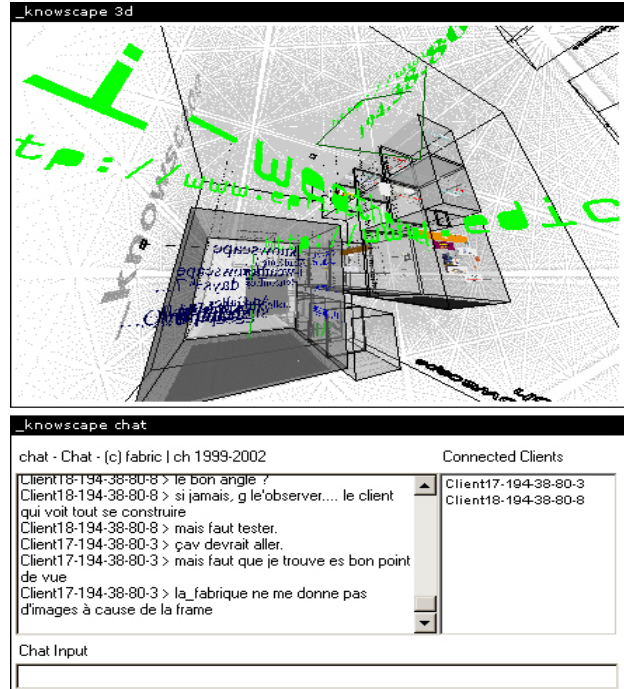
References:

1 Christian Babski, Patrick Keller, _'rhizoreality.mu'_, Web3D symposium, 2001, ACM SIGGRAPH, pages 109-116.

2 Patrick Keller, Christian Babski, _'la_fabrique: a Web3D electronic museum for the binary years'_, Computer Graphics, 2000, ACM SIGGRAPH, Volume 34, Number 2, pages 66-68.