

WORLDTOOL

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User of Sense8 World Tool™, VR Environment

Application Overview

WorldTool Version 1.0 is an interactive virtual reality development environment that allows customers to explore, build and publish virtual worlds. The customer can integrate different display devices, input sensors and tracking mechanisms with WorldTool's realtime image display system to provide varying levels of realism — from a conventional flatscreen display to a stereoscopic headmount where the user is a participant in a dynamic, synthetic 3D world.

A WorldTool user may come from a variety of fields, including architecture, medicine, education or entertainment. For example, an architectural design professional can benefit greatly by visualizing the interior and exterior three-dimensional form of a building before it is constructed. A head-mounted display used with WorldTool's realtime 3D graphics and its capability for importing popular CAD data exchange formats offers flexibility in previewing all aspects of a design directly from its CAD-database.

Customers involved in medical diagnosis, training or therapy might use WorldTool in a variety of ways. Newer forms of medical diagnostic data such as MRI and tomography are 3-D in nature. Once a surface model of the data set is constructed, presentation of this data set with the WorldTool rendering system can help a physician achieve a higher level of comprehension. A "surgery simulator" is also being considered by one customer involved in teaching veterinary medicine, where a synthetic animal will be operated on by an instrumented virtual scalpel that interacts with the tissues and organs. Behavior of the "skin" objects (how they react to the scalpel) can be programmed into the virtual world using WorldTool's Lisp command interpreter.

Virtual reality is a new and very flexible medium for the creation of a number of art forms, including dynamic sculpture and participatory theatre. The entertainment industry is also well suited to the creation of many individual and multiplayer gaming situations that require interactive multimedia presentation. WorldTool provides the basis for this new interactive performance medium and is being considered by one art institution for gallery installation.

A partial list of other potential application areas includes: therapy, robotic control, advertising and marketing, molecular modelling, engineering.

Development Process

The principal developers of WorldTool and the original founders of Sense8 were principal programmers and hardware designers of the Autodesk Cyberspace project. This project gave them experience in the construction of VR applications for architectural design visualization and mechanical CAD.

In contrast to today's rendering packages that produce very high quality static images or to special-purpose realtime 3D applications, WorldTool was designed as a general-purpose software substrate for conventional processors that provides support for the features and tasks common to a wide range of realtime 3-D graphical applications. WorldTool uses a combination of techniques for maintaining an adequate frame rate, including some borrowed from highend flight simulator technology. In addition, innovative database partitioning techniques have been incorporated into WorldTool to permit adequate display speed on large models.