Virtual 3D Environments as a Replacement to the Desktop Metaphor

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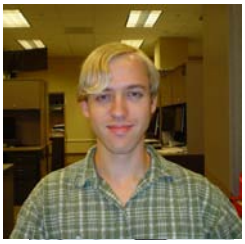

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Introduction

The desktop metaphor has persisted as the environment of choice in the personal and professional computing environment since its inception over 30 years ago.

The model was chosen as one accessible to new computer users used to a physical desktop environment for completing the type of tasks the computer was meant to assist with.

The purpose of this research is to explore alternatives to this metaphor and ascertain if and how the use of Virtual Reality technology can positively contribute to the expansion or replacement of the outdated desktop metaphor

This research studies specifically the window management capabilities of the desktop metaphor. It does not attempt to research or develop new information organization architectures or file organization techniques.

Background

The desktop metaphor was first introduced at Xerox in 1970. The Xerox Star was the first commercially available computer to implement this concept.

In 1984 the Apple Macintosh was released, bringing the desktop system to a wider audience.

In 1985, Windows 1.0 was introduced, being the first graphical operating system introduced by Microsoft Corp.

Since then, the desktop metaphor has been the dominant model for personal and business computing interfaces.

Research into alternatives to the desktop metaphor has been ongoing nearly since its inception.

Microsoft Task Gallery (Microsoft Corp.)

- The Task Gallery was developed by Microsoft Research as a way of organizing an environment around individual tasks.

Lifestreams (Yale)

- Lifestreams attempts to organize all computing items into a time-ordered stream, with the past being pictures/emails/etc received, and the future being upcoming events, reminders, to-do lists

BumpTop(Bump Technologies Inc.)

- Bumptop is a prototype desktop environment that attempts to model the desktop using realistic physics. Files are represented as boxes that can be positioned, thrown and stacked in 3D.

Project Looking Glass (Sun Microsystems)

- Project looking glass was an attempt to make a 3D desktop environment. PLG allowed the user to move and rotate windows in 3D.

Research

•Research prior work in the area to determine the status of other attempts at competing computing metaphors and assure viability of further research.

•Identify reusable concepts in prior work to be incorporated into second generation prototype.

• Create a prototype system to test assumptions.

- Prototype has to have enough functionality to allow it to be used as a test-bed for specific research questions later.
- Explore novel interaction techniques using head-tracking and 6DOF input devices

Impact

Data was gathered on a number of different academic projects designed as desktop metaphor replacements.

A number of concepts were taken from prior projects to be incorporated into a working prototype if further research is conducted.

Concept prototype was created with the following functionality:

- Create and close application frames in 3D space
- Move Frames in circular orbit around user
- Move frames closer and further away from head-tracked camera
- Rotate Frames horizontally and vertically.

Conclusions

Through study of past research in the area, it can be concluded that the market has not, of yet, dismissed alternatives to the desktop metaphor.

No viable alternative metaphors have been tested on a large scale or been given the chance to compete in the market place, making further research potentially rewarding.

Prototype shows many of the basic functions of managing application windows can be completed in a 3D environment using existing hardware and software.

Future Work

Further research in this area would include:

1. Further refinement of prototype

2. Perform user studies to compare performance against a traditional desktop environment.

3. Incorporate concepts from past research

4. Explore porting system to use more commercially available hardware.
   - Explore uses of widely available interaction tools (such as wiimote)
   - Explore lower cost and more widely available display devices (large-format high-definition display devices)