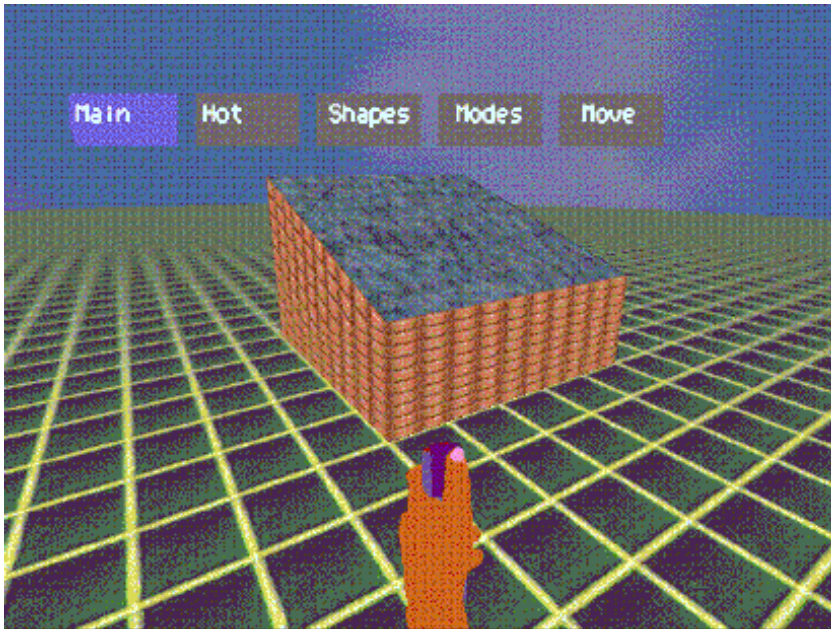




# GVU Center Virtual Environments Group

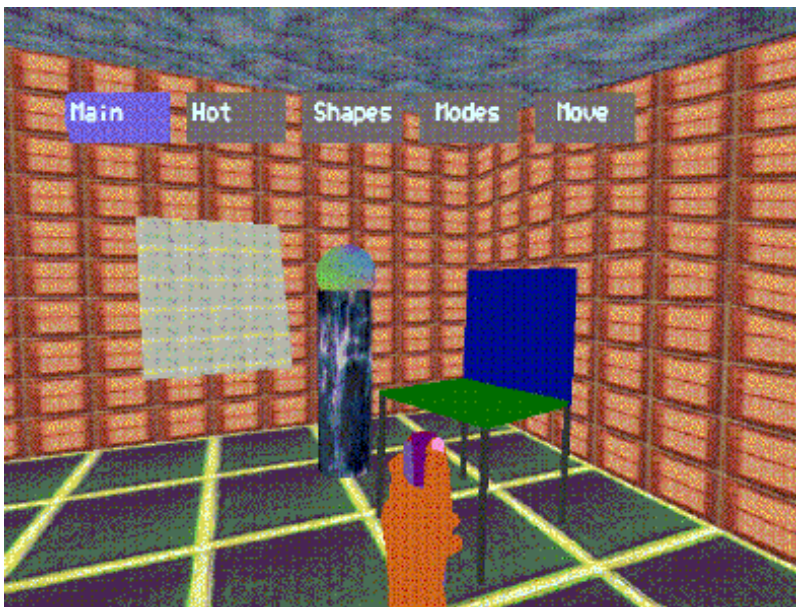
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## CONCEPTUAL DESIGN SPACE PROJECT

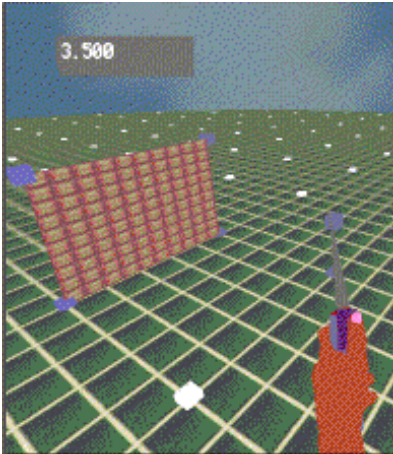


The Conceptual Design Space (CDS) is a real-time, interactive virtual environments application which attempts to address the issue of 3D design in general and immersive design in particular. We are researching innovative tools and interface elements for virtual worlds.

The first application of these techniques is an architectural one. Graduate students from Georgia Tech's College of Architecture will be using CDS to create conceptual building designs. The students will not only be able to inspect and "inhabit" their buildings, but will also have the ability to modify them, add details, or create new designs, all while immersed in the virtual world.

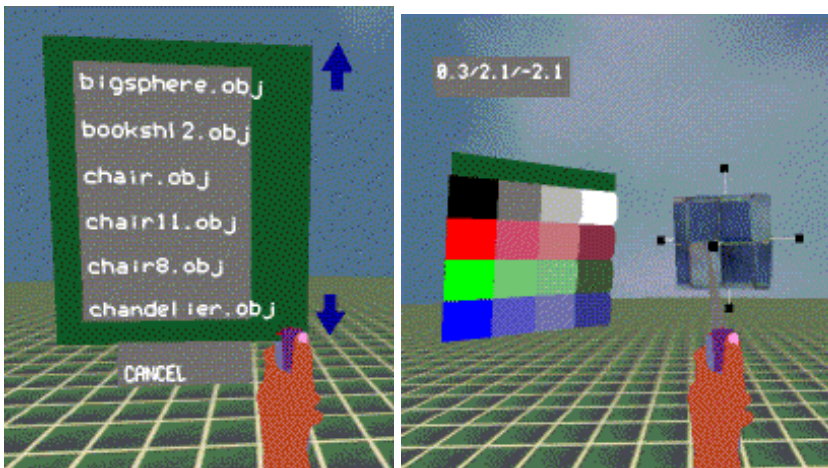


This application is a natural extension of the [Design Virtual Environment](#), our architectural walkthrough application. We hope that the ability to create and modify, as well as inspect, designs, will allow for greater experimentation on the part of the designer and lead to a better understanding of the architectural space.



Users of CDS can create simple buildings in an interactive, intuitive manner, simply by choosing vertices on the ground, then adding the third dimension by specifying a height for each vertex. The walls and ceiling are created automatically by CDS. Once the basic structure is in place, users may experiment with different colors and textures, add furniture to the interior of the space, or change the roof line, for example.

In the near future, CDS will offer interactive lighting changes, human figures for scale, libraries of architectural objects and textures, and the ability to export its conceptual models to workstation-based CAD packages for further refinement.



In the course of developing this tool for architectural design, we have created and/or refined a large group of general tools and interface elements for virtual environments. These tools include a 3D menu system, 3D widgets for object manipulation, dialog boxes, slider widgets, and tool palettes. In the images above, we show a file dialog box, the color palette and an information box giving the selected objects' 3D coordinates. It is our hope that these tools will be useful in the next generation of VE applications, which are sure to feature a great deal of user interaction. In general, we are attempting to provide the tools which will allow users to create virtual worlds while immersed in one themselves.

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## Publications:

- Bowman, D., "Conceptual Design Space - Beyond Walk-through to Immersive Design," in Bertol, D.,

*Designing Digital Space*, John Wiley & Sons, New York, 1996.

- Bowman, D. and Hodges, L., "User Interface Constraints for Immersive Virtual Environment Applications," Graphics, Visualization, and Usability Center Technical Report GIT-GVU-95-26.

[View the Abstract](#)

[Download a Postscript version of the paper](#)

- Bowman, D., "Immersive Design Tools for Virtual Environments," Technical Sketch presented at SIGGRAPH '95.
  - Bowman, D., "WiMP Design Tools for Virtual Environments," Video Proceedings of *Virtual Reality Annual International Symposium*, 1995.
- 

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