Interfacing with a Virtual Environment

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An interface is needed for something that is not quite a game, not quite a productivity app

Many books focus on:

- GUI design basics for system shells, applications, & websites
- Interacting with virtual environments in an immersive way
- Video game GUI design

Something in between is needed

The Problem
Comes to us from theater
  - Audience is on the outside looking in
  - The wall is broken when the performers address the audience directly
-On a television, the wall is the screen
- In a game, the user is both audience *and* performer

The Fourth Wall
Games certainly elicit actions from the user, but these usually occur by addressing the player.

Breaking the wall requires that we address the viewer directly.
Diegesis is about the interaction of the two worlds

My application needs to interact with both the player and the viewer depending on context and task

If the user wants a map of the site, do we show it to the player or the viewer?

- Is the object part of the “story”?
- Is there a reason to represent it in “game” space if it is not?
How do we move in the environment and manipulate objects?

Exocentric: move around an object (Illustrator, Maya)
- Observing from the outside
- Free 3D navigation
- Little immersion

Egocentric: the world moves around the player (flight sim, FPS)
- High immersion
- Limited movement
- Easily disoriented or lost

Multiscale: provide different controls in different contexts
- What is the task at hand?

Navigation
In a 3D environment, should all controls be part of that environment?

- Enhances immersion
- More similar to real-world actions
- More fatiguing
- Less efficient

What is the task at hand?

What kind of hardware are we using?

2D vs. 3D Controls
Visual Hierarchy

- Where is the eye drawn?
- How is the movement of the eye guided or constrained?
- What stands out and what is subdued?
If the game world is to have prominence (promote immersion) is it better to have floating windows, buttons, or other controls over the viewport or to have a toolbar?

- Windows occlude the virtual environment, even if semitransparent, lessening immersion
- Controls without windows or some sort of background might not stand out enough
- A toolbar is small and stands out on its own without interfering with the VE
- How easy is it to use a toolbar?

Visual Hierarchy
If a user wants to analyze a 3D model, in essence bring it out of context, what then?

- The virtual environment is no longer important
- We can occlude the VE and open a floating window where the user can manipulate the object and view its metadata
Icons have unique design requirements

- Familiarity
- Limited number
- Each needs to be distinctly different from others
- 3D icons stand out in visual hierarchy but thus can be distracting
- A selected icon needs to show that it is selected in an obvious manner
- Each icon must be distinct
- All icons must have a common theme
Consistency is key
- Users learn the locations of things (icons, etc.)
- This spatial memory increases efficiency
- Keep controls in the same spot both during runtime and across versions
- What happened when Microsoft switch from toolbars to a ribbon interface in Office products?

Spatial Memory
As this application will have several “modes” including immersion, analysis of individual objects, and viewing raw data in context, an interface will be needed that address each of these tasks

- During immersion, keep visual controls to a minimum, with a toolbar or perhaps a collapsing sidebar if non-icon controls are needed
  - Use first-person camera, minimal controls

- During analysis, make the virtual environment less important through partial or complete occlusion
  - Floating window with the areas around it subdued

- When viewing raw data in context, the goal is no longer immersion but the analysis of spatial relationships: both the VE and the raw data become important.
  - Use a free camera, keep relevant controls visible, can occlude VE

Conclusions


References