CS 6724: 3D Interaction

Introduction

Doug A. Bowman

August 24, 2004
WE HAD TO CUT SOME CORNERS TO GET THE DEMO READY THIS SOON.

WALLY IS UNDER THE TABLE. HE'LL PRETEND TO BE THE 3-D INTERFACE THAT WE COULD BUILD IF WE WEREN'T DOING USELESS DEMOS.

HE'S A LITTLE FUZZY. CAN YOU ADJUST IT?

TRY THE ELECTRIC SHAVER.
A scenario...

- An architect sits in her home office, putting the final touches on the design of the new entrance to the city park. A three-dimensional virtual model of the park appears in front of her on the desk’s surface. She nudges a pathway slightly to the right to avoid a low-lying area, and then makes the model life-size so she can walk along the path to view the effect. “Those dark colors on the sign at the entrance are too foreboding,” she thinks, so she quickly changes the color palette to brighter primary colors.
A scenario (cont.)...

- She looks up and notices that the clients are arriving for the final design review meeting. They are located in other offices around the city, but they can all view the 3D model and make suggested changes, as well as communicate with one another. “What’s the construction plan?” asks one of the clients. The architect starts an animation showing the progress of the project from start to finish.
“That first step may not work,” says the client. “The excavation is much too close to the existing playground. Let me show you.” He looks out his window, which has a view of the park, and overlays the virtual construction plan on it. “You’re right,” says the architect, “let’s plan to move the playground slightly—that will be much cheaper than changing the construction site.” After viewing the effects of the change, all agree that this plan will work, and the meeting adjourns.
Questions raised by the scenario

- How did the architect load the park model?
- How did she manipulate her view of the model?
- What technique is used to change the pathway?
- How can multiple clients all manipulate the model at the same time?
More questions from the scenario

- How do the participants appear to one another in the virtual meeting?
- How is the speed and playback of the animation controlled?
- How did the client instruct the system to merge the real and virtual scenes?
Perhaps you don’t like text scenarios...

- http://www.asktog.com/starfire/texturedmap.qt
What is 3D interaction?

- Human-computer interaction in which the user’s tasks are performed directly in a 3D spatial context.
What are 3D user interfaces (3D UIs)?

- Simple...UIs that involve 3D interaction
What do these definitions really mean?

- Are all interaction techniques used in the CAVE (for example) 3D interaction techniques?
  - No
- Do all 3D applications have 3D UIs?
  - No
- Do any desktop applications have 3D UIs?
  - Yes
- Are all the interaction techniques in this course 3D interaction techniques?
  - Surprisingly, no!
How does this course relate to...

- ...virtual environments?
- ...computer graphics?
- ...HCI?
- ...3D games?
Where does this field come from?

- Every technology that uses complex 3D graphics, 3D display devices, and/or 3D input devices, has experienced an "interface crisis."

- 3D UI design as an area of study is simply the application of HCI principles to these technologies and systems.
Why is this topic important?

- 3D interaction is relevant to real-world tasks.
- The technology behind 3D UIs is becoming mature.
- 3D interaction is difficult.
- Naïve 3D UIs are either simple or lack usability.
- 3D UI design is an area ripe for future work.
What are the goals for the class?

- Learn the state-of-the-art
- Experience well-designed and poorly-designed 3D UIs
- Learn to design, implement, and evaluate new 3D UIs
- Gain the skills necessary to do your own original research in the area
Will you be using this slide template all semester?

- Don’t be ridiculous...I’ve got plenty more where this came from
Why did you make us buy such an expensive book?

A. It’s worth it - look at that fancy cover!
B. Budget cuts have forced professors to seek supplemental income
C. Just be glad we decided not to include the animated holographic imagery in chapter 10
D. All of the above
OK, now on to the boring parts...