Chapter12:

3D INPUT

Incomplete: This chapter deals with input in 3D. There is some overlap - yet to be resolved - with te Chapter on Gesture. Check both places if you are looking for information.

Selected references covering material to be covered by this chapter:

Use of 2D Devices for 3D Interaction:
- Evans, K., Tanner, P. & Wein, M. (1981)
- Nielson, G.M. & Olsen, D.R. (1986)
- Philips, C. & Badler, N. (1988)
- Chen, M., Mountford, J. & Sellen, A. (1988)
- Mackinlay, Card & Robertson (1990)
- Shoemake, K. (1990; 1992)
- Robertson, G. G., Card, S. K. & Mackinlay, J. D. (1989)
- Bier, E. (1986)
- van Emmerik, M. (1990)
- Baraff, D. & Badler, N.I. (1989)
- Chapman, D & Ware, C. (1992) re predictor feedack.
- LeBlanc, A., Kalra, P., Thalman, N. & Thalman, D. (1991). Sculpting with the "Balland Mouse" metaphor, *Proceedings of Graphics Interface '91,* 152-159.
- Venolia 3D mouse & toybox

Use of 3+D Devices
- Badler, N., Manoochehri, K.H. & Baraff, D. (1986)
- Baraff, D. & Badler, N.I. (1989)
- Hinckley, K., Pausch, R., Goble, J., Kassell, N. (1994). A survey of design issues in spatial input. *Proceedings of UIST '94,* 213-222.
- Ware, C. & Jessome, D. (1988), Ware (in press), Ware & Baxter (1989), Ware & Osborne (1990).

- Sachs, E., Stoop, D. & Roberts, A. (1989)
- Venola (1989; 1993)
- Ware, Arthur & Booth (1993).
- Waters & Wang (1990) discuss use of data-glove, Space-ball and Polhemus to manipulate physically-based objects. Actions such as distorting surface, etc. No comparative evaluation of devices. Just discussion of tasks.
- survey of glove-based input: Sturman, D.J. & Zeltzer, D. (1994).
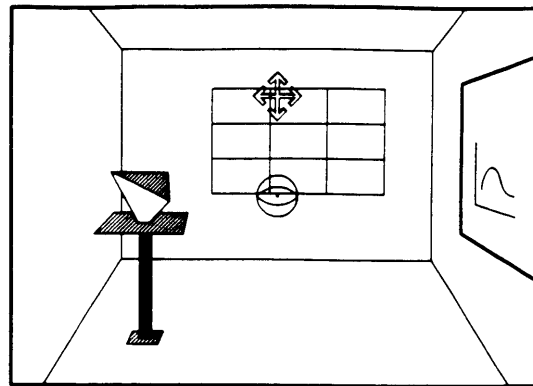- Schmandt, C. (1983). - half-silvered mirrors

Figure XX: Navigating in 3D Rooms
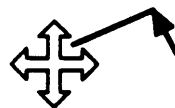*From Robertson, Card, & Mackinlay (1989)*

Figure XX: Virtual Rate-Controlled Joystick
From Robertson, Card, & Mackinlay (1989)

Figure XX: Characterization of Navigation Aids
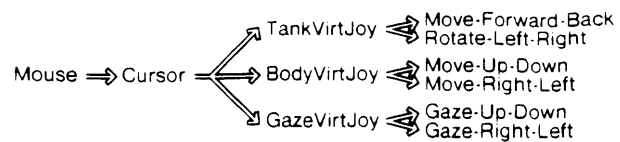*From Robertson, Card, & Mackinlay (1989)*

Figure XX: Characterization of Navigation Aids
From Robertson, Card, & Mackinlay (1989)

Armatures
- Knep, B., Hayes, C., Sayre, R. & Williams, T. (1995). Dinosaur device
- The monkey
- Puppetworks

Motion Capture
Used especially in annimation. Not just modelling object, but dynamics of motion. Different methods of capture:

Instrumenting the body
Mount position or angle sensors on body and have body move. Example is Alias Motion Capture

Optical Tracking
Mount typically (IR) reflective spots on body. Then have camera(s) pick up body in motion