3D on the Cheap - the consumer Market Stereo Surge
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Sam Fulcomer – sgf@brown.edu

BROWN UNIVERSITY CENTER FOR COMPUTATION AND VISUALIZATION

Presentation Outline

- Why stereo?

- Why care about the cheap stuff?

- Review – what we've used at Brown

- The recent explosion in content and products

- …and what we're doing with it…

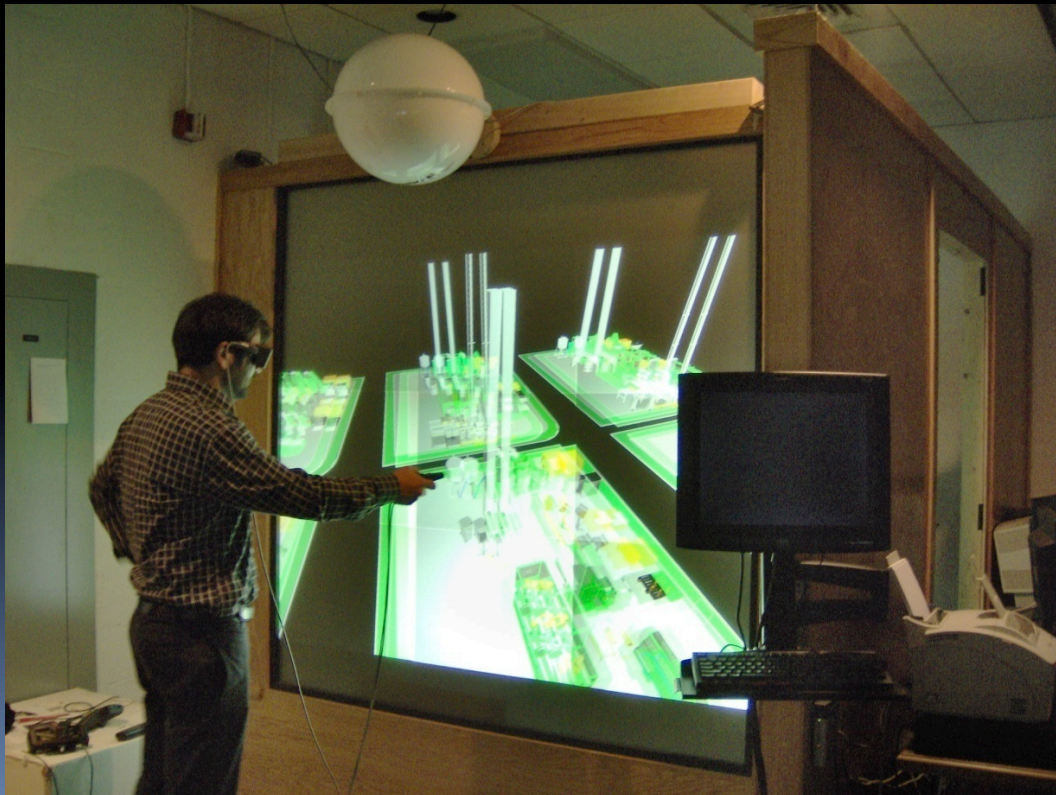- What's around the corner…

Why stereo?

- Perception of spatial relationships in scenes (esp. with high depth complexity)

- Strong enabler of VR

  - Why VR?... another talk...

- Strong enabler of sophisticated UI

  - e.g., Selection/picking in Z (e.g., Prabhat, Forsberg, A., Katzourin, M., Wharton, K., and Slater, M. 2008. A Comparative Study of Desktop, Fishtank, and Cave Systems for the Exploration of Volume Rendered Confocal Data Sets. *IEEE Transactions on Visualization and Computer Graphics* 14, 3 (May. 2008), 551-563. DOI= http://dx.doi.org/10.1109/TVCG.2007.70433

Why care about the low end?

- Graphics cards driven by games since late '90s
  - Volume
  - Competition
  - Rapid innovation
  - Sci-vis, high-end interactive rendering wins…
  - But, no stereo to get excited about (until now)
- Now…
  - Stereo is next big thing in cinema/broadcast
  - Nearly all CE OEMs building stereo-capable displays
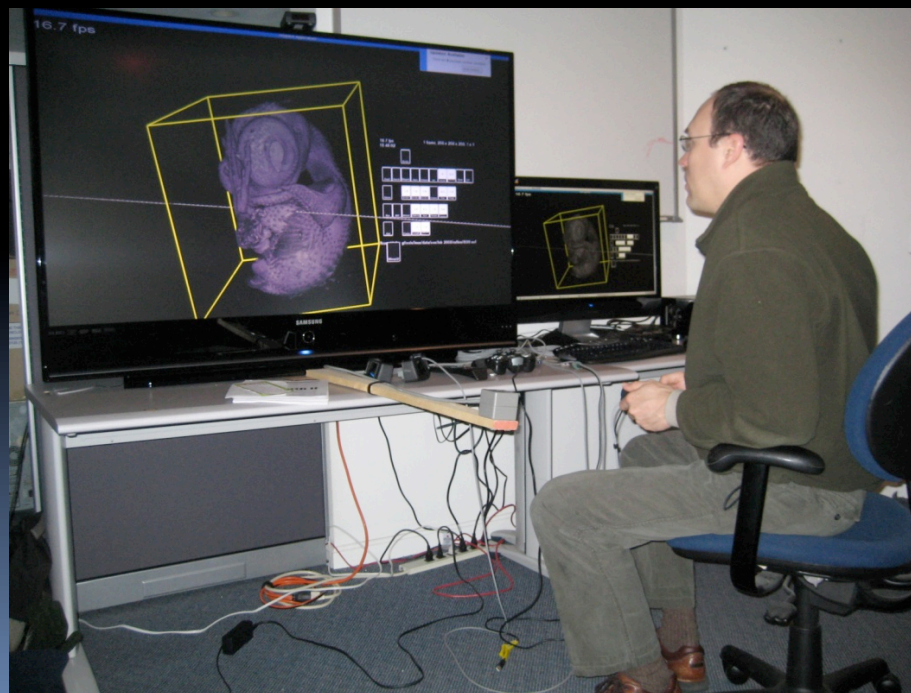 - As with rendering, content is driving product proliferation
  - We win…

Review & what we've used…

- DepthQ SVGA DLP (2005-ish)
  - 800x600 120Hz DVI in, ~$2k

..and what we've used...

- Samsung 3D-DLP projection TV (2007-ish)
    - 1080p, 120Hz, LED lamp, checkerboard stereo
    - Problem: multi-display synch

…and more…

- Mitsubishi LaserVue (2009)
  - 1080p, 120Hz, laser light source, checkerboard
  - Laser light transmitted via fiber bundle
  - Problem: laser speckle, limited product life.
  - Mitsubishi disrupts coherence with moving diffuser
  - Rotating a quarter-wave plate could do the same

…until the latest…

- Dell S300 short throw projector (2010)
  - 720p, 120Hz, 5000-hr. lamp, ~$700, .521 throw ratio, wired or wireless Ethernet
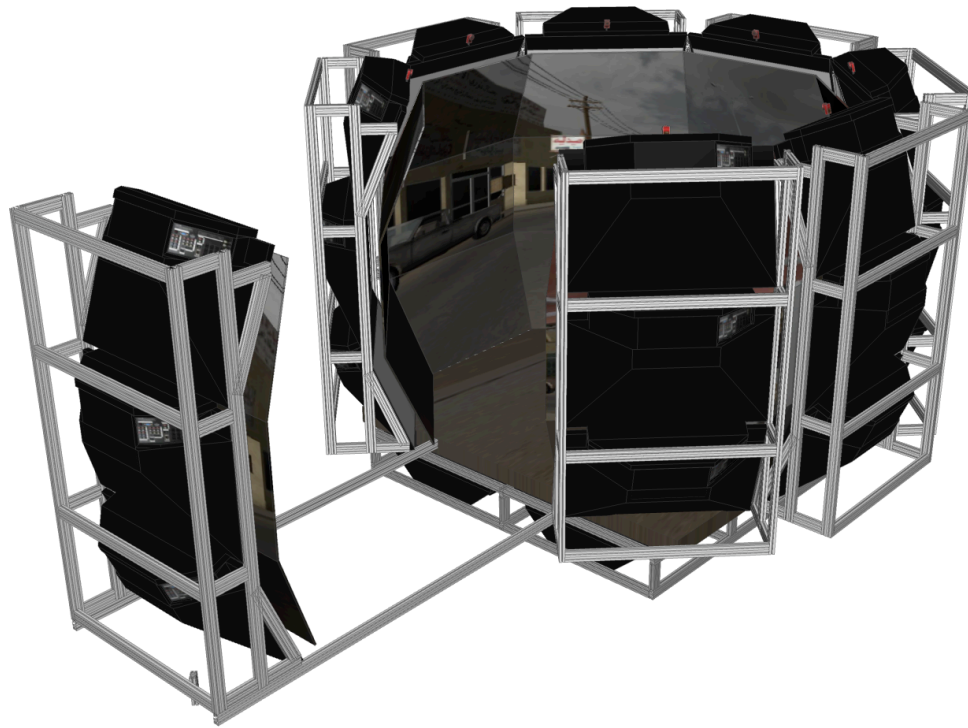 - Problem: conventional lamp…

Tons of stuff available now

- Quadro adapters with USB stereo sync - $100
- 32 sub-$1k projectors (projectorcentral.com)
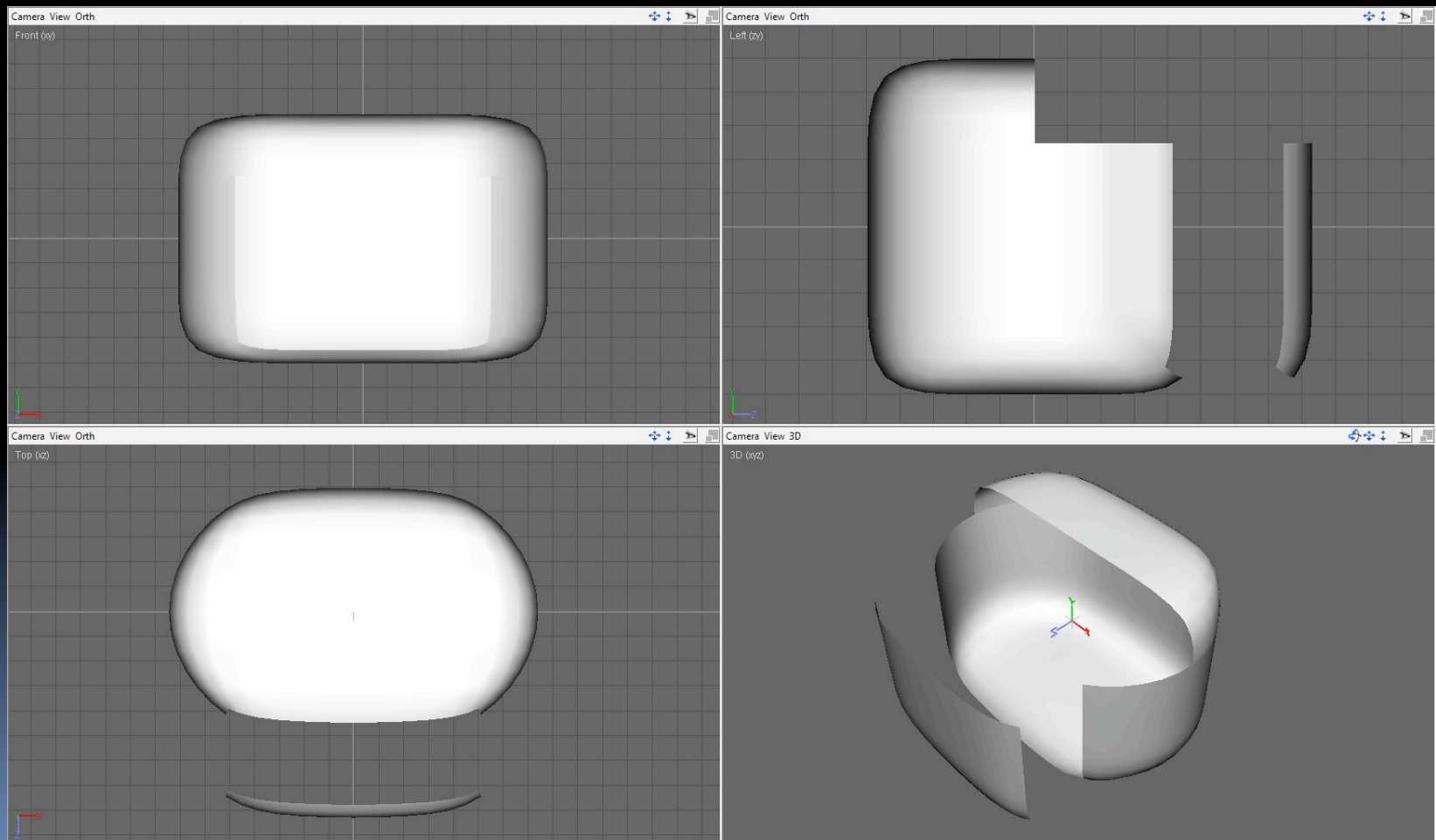- Comm. Cinema-quality/durability LC glasses (XpandX, the NuVision successor)

What we're doing at Brown…

- A new Cave…

…what we're doing…

- …or a new Cave…

…what we're doing…

- …probably a new treadmill Cave…

…more we're doing…

- 3-panel LCD stereo…

What's around the corner…

- 4-color light sources… (RGBY LCD's today)
  - RGBA LEDs soon…
- LED light-source f-s stereo capable projectors
- Quad-buffered stereo in DirectX