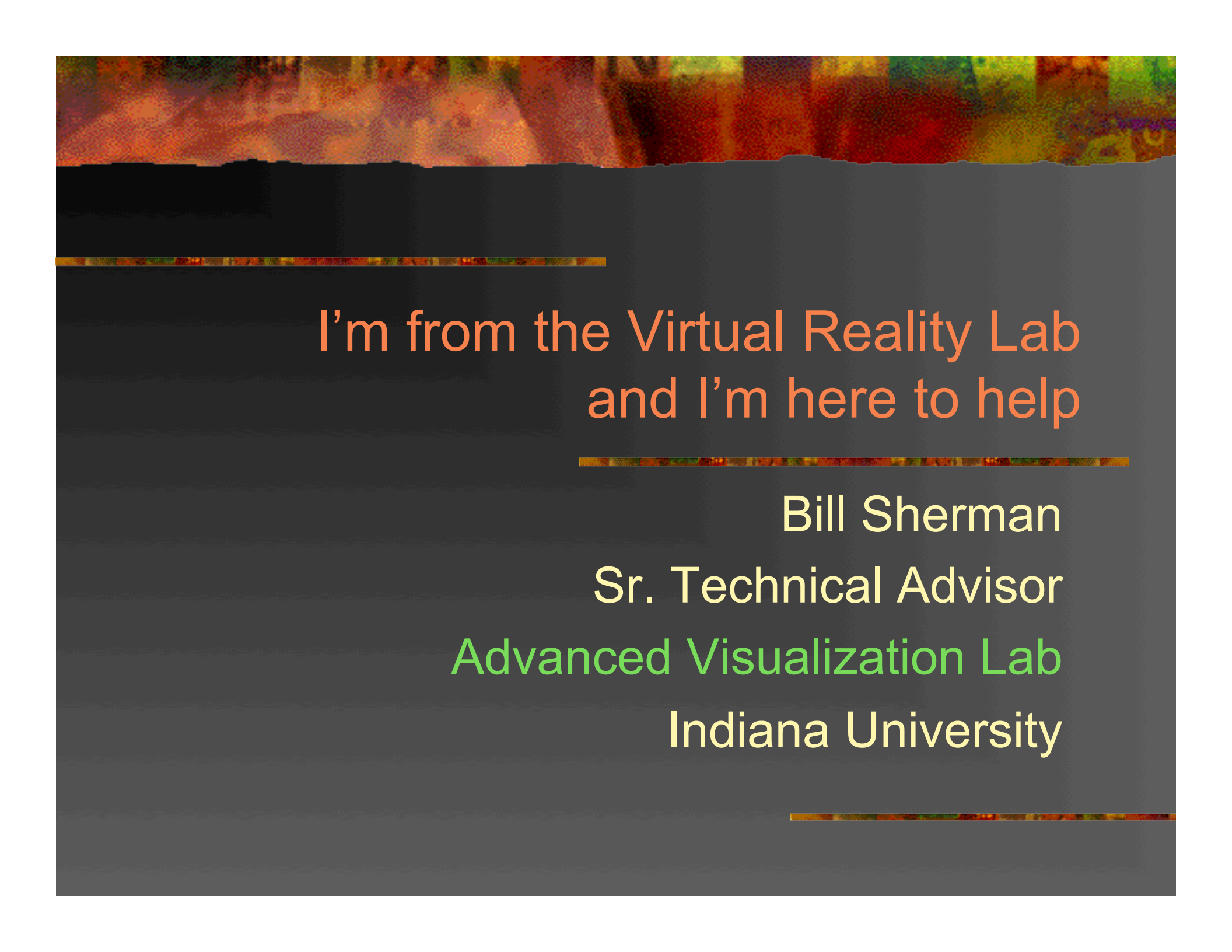




I'm from the Virtual Reality Lab
and I'm here to help

Bill Sherman
Sr. Technical Advisor
Advanced Visualization Lab
Indiana University

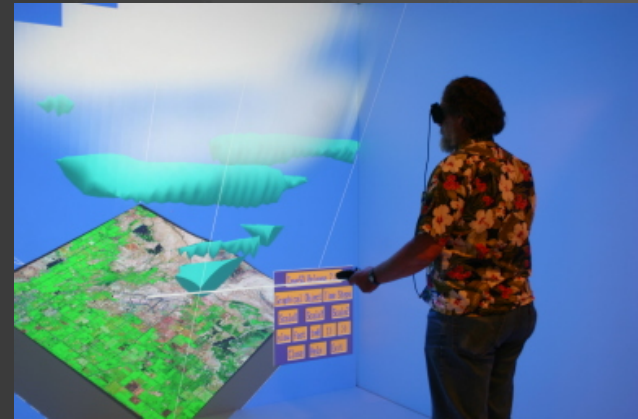
Why Virtual Reality?

- Provides physical immersion
“you are there”
- Three dimensional, intuitive interface
- Human scale interface

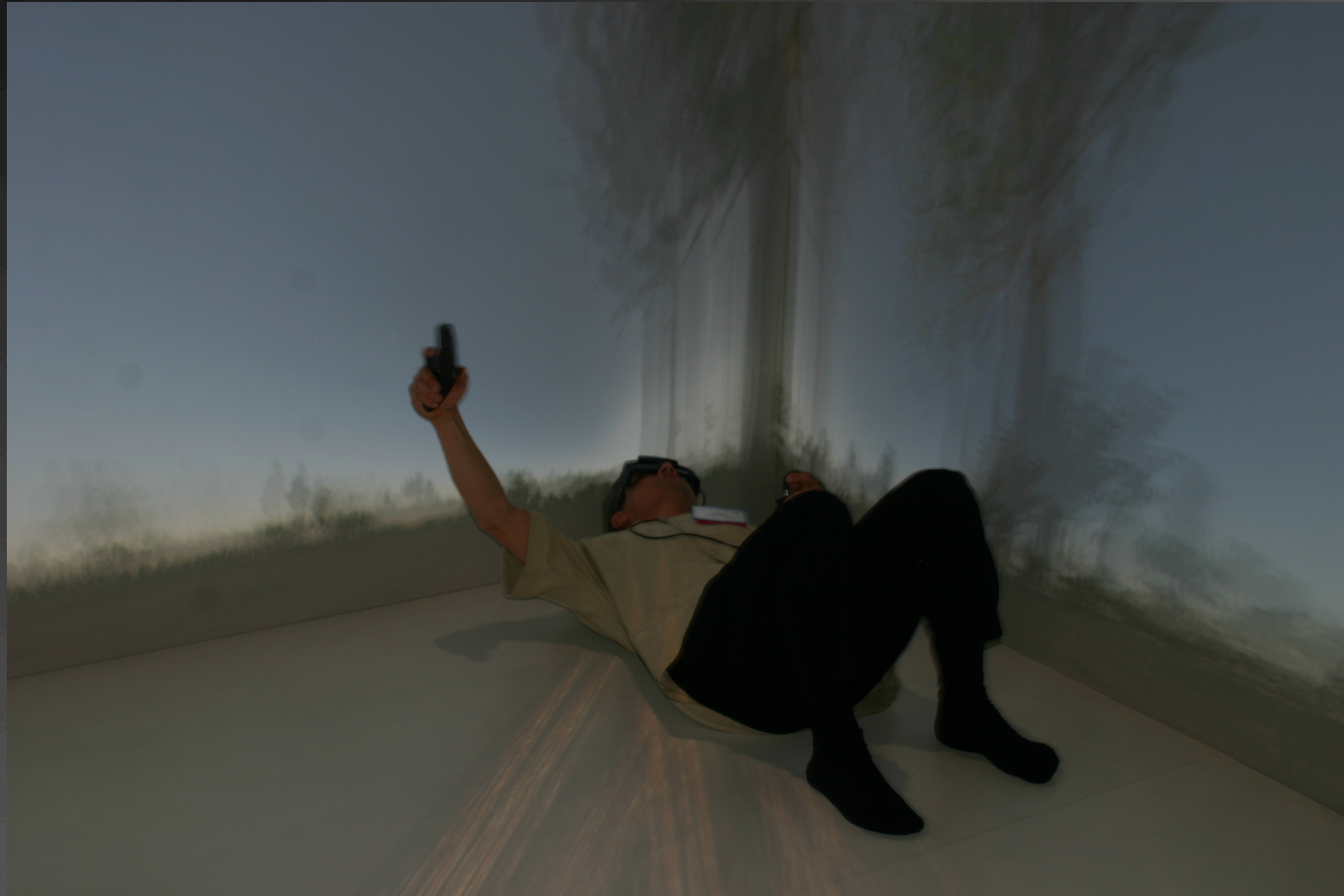


To What End?

- Scientific Visualization
- Simulation and Training
 - Scenario training
 - Medical procedures
- Building design & review



Immersion



Virtual Reality: the Hype Curve

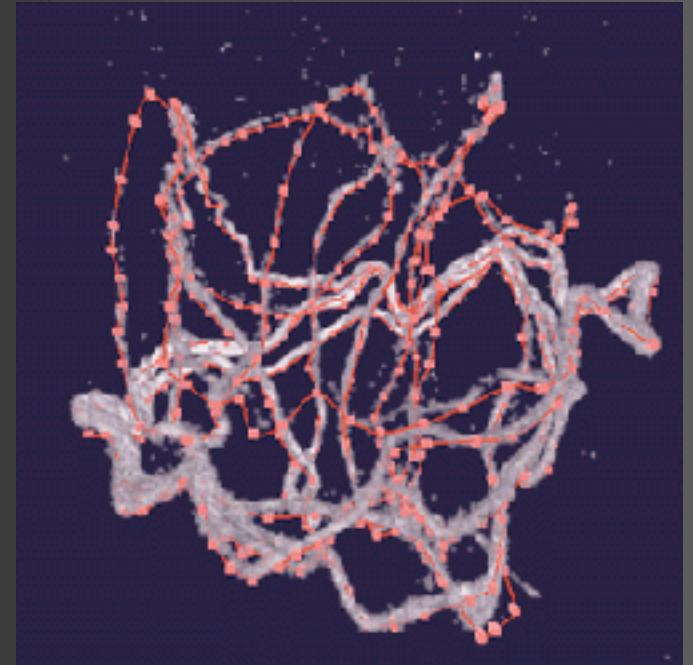
- Technology Trigger:
 - 1989
 - VPL Research Inc.
 - Affordable Hardware
- Peak of Inflated Expectations:
 - 1992 – 1995
 - Media Exposure
- Trough of Disillusionment:
 - 1995 – 1998?
- Slope of Enlightenment:
 - 1998 – present?
- Plateau of Productivity:



Image by Gartner Group

Exemplar: Crumbs

- Early immersive volume visualization tool
- Added interactive measurement enabling feature
- Case: Tim Karr studying fruit flies – multiple visits to the CAVE to make measurements

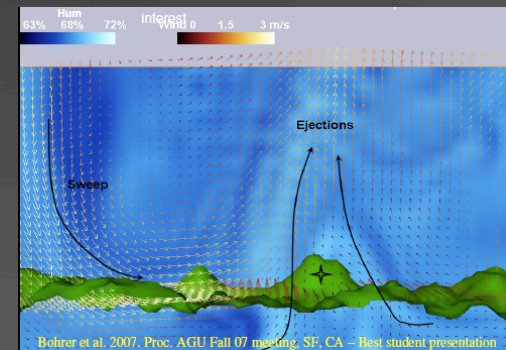
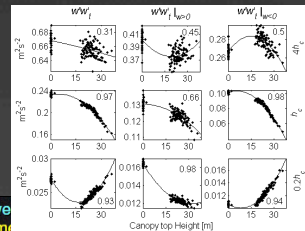


Exemplar: Comparative Study

- Prabhat, et al. (Brown U)
 - “A Comparative Study of Desktop, Fishtank, and Cave Systems for the Exploration of Volume Rendered Confocal Data Set”
 - Performance benefits measured between Desktop and Immersive Table
 - Further benefits measured from Immersive Table to CAVE
-

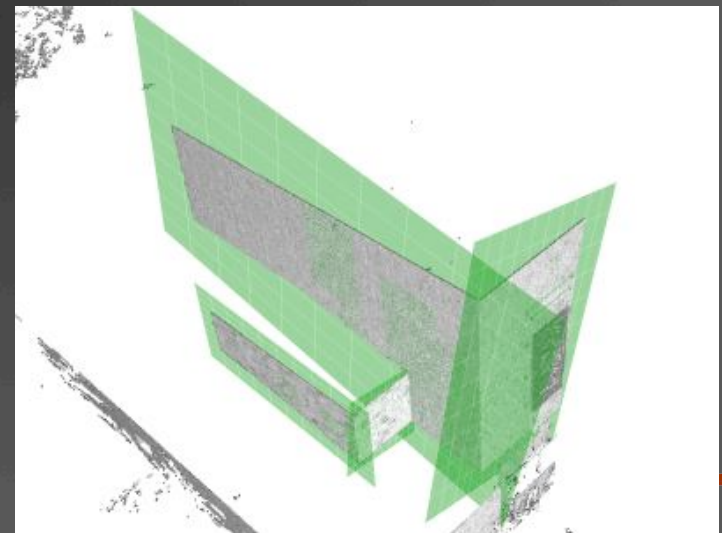
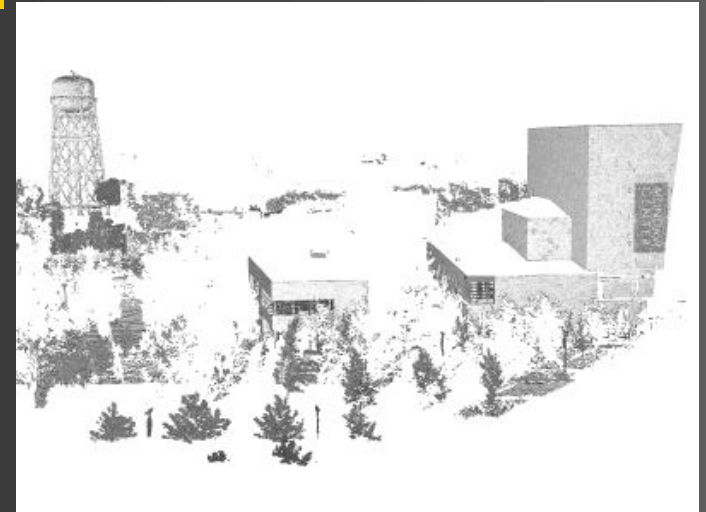
Exemplar: Atmospheric flow

- Effects of vegetation on atmospheric flow
 - Gil Bohrer's PhD research
 - Free exploration and conversations enabled through immersive interaction
- Getting to here:
 - From here:



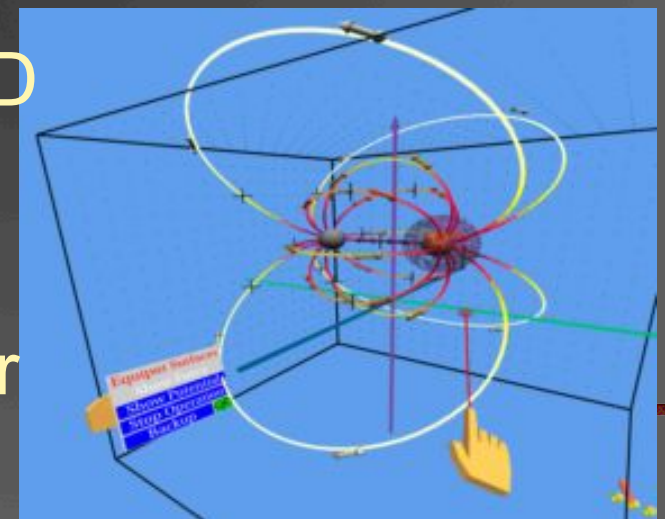
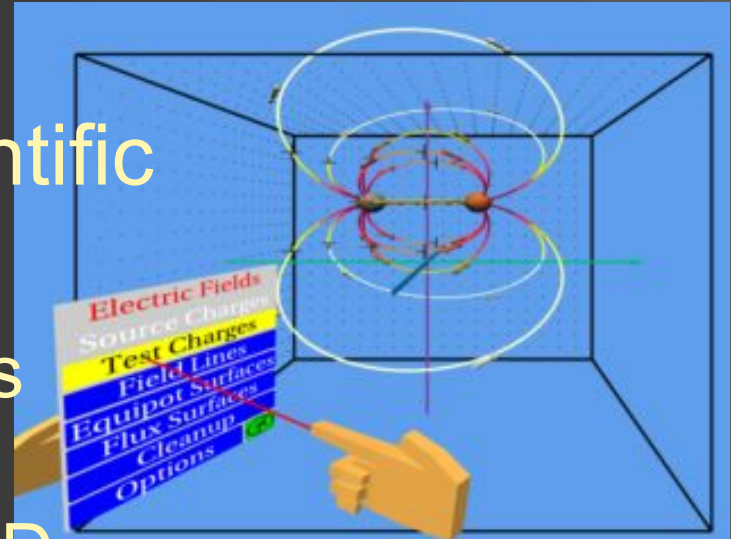
Exemplar: LiDAR tool

- LiDAR viewer/manipulator tool of Oliver Kreylos at UC-Davis
- Repeat users from the USGS
- Allows something that can't easily be done at the desktop



Exemplar: Science Space

- Study on learning 3D scientific concepts
 - A-level high-school students learned and were tested on concepts of magnetism in 2D
 - Didn't really understand the 3D structures
 - Immersive 3D presentations found to give students a better understanding



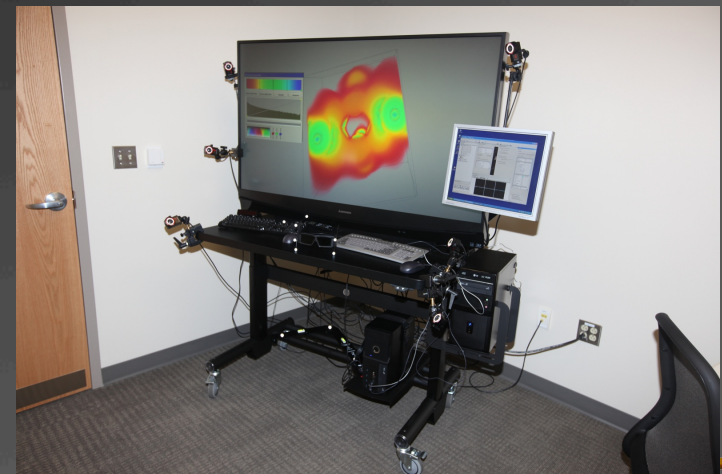
Exemplar: Training

- Better to learn dangerous and stressful tasks in a safe environment
- Psychological studies have demonstrated that even simple virtual worlds can be sufficiently compelling to produce physiological effects



Scalability of VR

- Physical scale
 - Location-based resources vs. local resource
 - CAVE-like displays
 - Wall displays
 - IV-station
- Software
 - Limited community-wide shared tools



Barriers to entry

- Cost
 - Lower cost allows easier entrée
 - Software
 - More likely to be the issue
 - Expertise
 - Perhaps the most important ingredient
-

Concluding thoughts

- Why not already in high use?
 - What is the metric?
 - Training – hours of usage
 - Sci-Vis – what to count?
 - Number of hours facility is used?
 - Number of hours saved by use of the facility?
 - Number of discoveries enabled?
-



FIN

