

ACM CSC'93 TUTORIAL ON VR: OUTLINE

William Bricken

September 1992

TUTORIAL TITLE

Virtual Reality and Experiential Computation

TUTORIAL ABSTRACT

Virtual reality is a computer generated, multi-dimensional, inclusive environment which can be accepted by a participant as cognitively valid. VR provides the opportunity for experiential computation, for direct participation in formal systems. The tutorial will cover the essential characteristics of virtual reality, system architectures, software tools, applications, philosophies, and social implications.

TARGET AUDIENCE

Professionals in information sciences who are seeking a deeper knowledge of the technical aspects of virtual reality.

TUTORIAL OUTLINE

The tutorial will cover the essential characteristics of VR:

- history of the field
- philosophy and mathematics of inclusion
- natural interaction as opposed to symbolic mediation
- multisensory display
- multi-dimensional environments
- the sense of presence

The architecture of VR systems:

- display hardware
- computational hardware
- software operating systems
- software tools
- interface techniques
- world construction techniques
- the participant's experience

The focus will be on the software infrastructure and tools for maintaining virtual environments, including:

- the Virtual Environment Operating System (VEOS)
- Linda models of coordination
- entity management
- objects, spaces, and abstractions
- languages and specifications
- the Cube
- the Wand
- the Virtual Body
- multiple participants and inconsistency maintenance
- editing and interaction techniques
- information navigation
- design of virtual worlds
- embedded narrative

Applications to be discussed:

- participatory systems with natural semantics
- abstract worlds
- world building by high school students
- design and maintenance of aircraft
- teleconferencing and cooperative work
- experiential mathematics

Philosophical bases of VR:

- information space
- boundary mathematics
- representation and reality
- form and substance

The tutorial will close with consideration of the issues and implications of VR for participants and for social institutions:

- cultural interpretations of VR
- property, ethics, and accessibility
- physical literalism
- intoxication
- consistency and coherence
- post-symbolism
- relativity