DIRECTIONS OF GROWTH: SLIDES AND BULLETS

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Psychology is the Physics of VR

- Our body is our interface.
- Knowledge is in experience.
- Data is in the environment.
- The essence is inclusion.

VEOS, the Virtual Environment Operating System

- Resource, communication, memory, and meaning management for
  - signals from behavior transducers
  - world construction and dynamics software
  - virtual world tools
  - distributed computational hardware
  - intentional displays

Limits of the Art

- CAD is not inclusive.
- Objects are not persistent systems.
- Interface techniques are not cybernetic.
- Virtual world tools have not yet been designed.
- Consistency is required.
- Formal systems don't include a participant.

The Virtual Body

- Your interface to Virtual Reality
- Tightly coupled to experience
- Configurable
- Collects and analyzes activity
- The tool of presence

The Wand

Senses orientation and position
Emanates a ray for
pointing
measurement
connecting
grasping
jacking
moving

Entities

System Oriented Programming

An assembly of information fragments. Attach:
sensor streams for sensitivity to the environment.
disposition rules for behavioral tendencies.
effectors to change the world.
geometry for a graphic representation.

VEOS Design Decisions (Technical)

Distributed, heterogeneous resources
Transparent symbolic mechanisms
Entity based modeling
Inconsistent worlds

VEOS Design Decisions (Practical)

Research vehicle
Use existing software
Functionality rather than efficiency
Generic
Public domain

Virtual Prototyping

Information overload from complex data and machines
Natural semantics interface
Multiple participants in inconsistent worlds

Education

- Learn by doing
- Direct experience rather than symbol manipulation
- Programmable training systems
- Natural semantics
- Shared experience
- Expanded capacities

Experiential Mathematics

- Spatial representation of abstractions
- The participant is an operator
- Fly-through expert systems
- Manipulable logic blocks
- Direct experience programming
- Formal foundation for participatory worlds

Lessons Learned

- One experience is worth a billion bits.
- Scale and time are accessible.
- Mental models are loosely coupled.
- Realism is not necessary.

Risks

- Descriptive confusion
- Lack of experience
- Cognitive remodeling
- Fluid self
- Sensory overload, sensory ecstasy
- Power and control
- Cultural adaptability

Evolving Philosophies

- Situated semantics
- Constructivism
- Immaterial realism
- Computation is experiential
- Reality is negotiable
- Computers are reality generators

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VEOS: The Virtual Environment Operating System

Objective

To develop a resource, communication, and memory management system to coordinate
- interface and peripheral devices
- world construction software
- dynamic simulation software
- virtual world tools
- computational hardware

Background

- needed by all applications
- public domain
- devices will change rapidly
- functionality
- abstraction

Approach

- research vehicle
- distributed, heterogeneous resources
- transparent symbolic mechanisms
- entity based modeling
- use existing software
- functionality rather than efficiency
- accommodate virtual world tools

Payoff

- de facto standards
- research coordination
- foundation for value-added marketing
- critical evaluation of technology