

Introduction to Collaborative Virtual Environments

Edwin Blake
Department of Computer Science
University of Cape Town

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edwin@cs.uct.ac.za

The Course

Advanced Course given by couple of lecturers: Edwin Blake, David Nunez, Bill Tucker and James Gain.

Only for those who take part actively:

- read papers
- do practical

Assessment:

- Still being finalized
- 60% for final exam based on talks (slides), handouts and papers.
- 40% for practical exercise.

CVE Intro

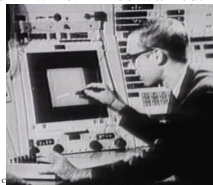
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The Ultimate Display

“The ultimate display would ... be a room within which the computer can control the existence of matter. A chair displayed in such room would be good enough to sit in.”

“With appropriate programming such a display could literally be the Wonderland in which Alice walked.”

Ivan Sutherland 1965



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Course Content

Intro to VE — Edwin What is VE, VE applications
Introduction to Genesis 3D — Dave
Shared VE Systems — Edwin
Presence and Environmental Perception — Edwin & Dave
Avatars & Co-presence
Issues in Assessing VEs — David N
Multimodality — James
Networking VEs — Bill
Applications and Design
Rendering & modelling (Optional)

- Introduction to real-time rendering for VE
- Visibility Culling
- Image based rendering techniques

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This Talk

Overview

- Intuitive understanding of what is special about VR
- Naming some of the concepts

Reading

- The slides (on web)
- No Text Book.
- Several Handouts.

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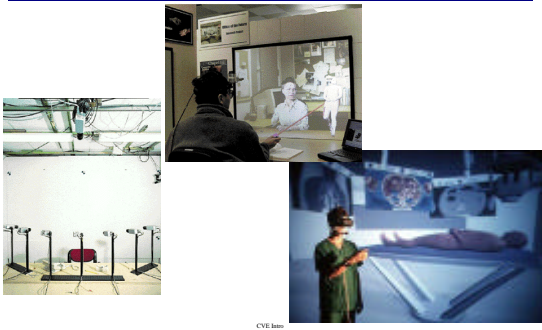
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Virtual Rehearsal

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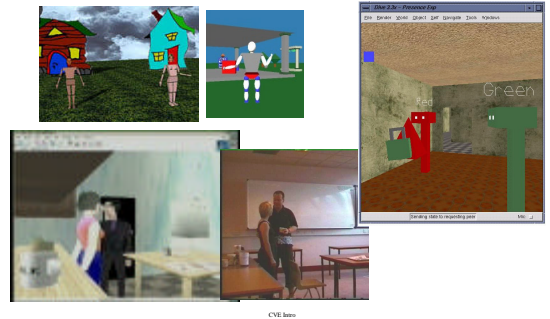
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Where are you now?



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Who are you? Who are they?



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What is the use?



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What are Virtual Environments?

Virtual Environments

- interactive simulation of three-dimensional animated world in a computer
- 'being there'

Systems

- Override senses
- Track movements

History

Head-mounted display—Sutherland 68

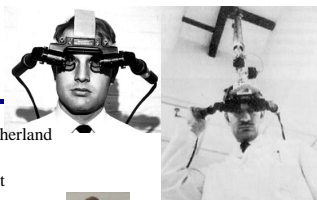
Evans & Sutherland — flight simulators 70's

Myron Krueger — Artificial Reality, 1973

Virtual Reality—Lanier 80's

Cyberspace — Gibson (Neuromancer)

Aim: legal "trip"?



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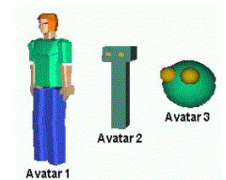
What are Collaborative Virtual Environments?

Shared spaces

- (Many) People meet
- Collaborate on tasks

Avatar

- user is an explicit part of the system
- *Hindu Mythology*: The descent of a god to earth in incarnate form.
- An incarnation or embodiment of another person ...



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Applications of Collaborative Virtual Environments

Education
Virtual Shopping
Architecture
Visualization
Tele-medicine
Psychotherapy
Games
Flight Simulators
Military

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Exercise

How is a shared virtual space different from a tele-conference?



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Answer: Shared Space

- you are actually in the world of your problem domain.
- you can turn to any one in the group and talk to them.
- no distinction between
 - room you are in,
 - one your collaborators are in,
 - one that your work is in.



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Problems

Realism

- Is it needed?

Latency

- Networks
- Systems
- ⇒ Nausea

Authoring

- Tools
- Methodology

Expense

Hype

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Concepts: Hardware and Systems

Immersion

- Immersive tendency

Latency

Shared spaces

Caves

Fish-Tank VR

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Concepts: People

Suspension of Disbelief

- realism
- abstraction

Presence

- Tele-presence
- Personal Presence
- Co-presence
 - Avatar
- Environmental Presence

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Conclusion: Guiding Questions

Is this really different?

- More than just a 3-D interface to a computer?

Just what is it that constitutes the differences?

- The systems?
- The response of people?

Does it matter?

- Is it useful?
 - Does it have to be?

How do you do it?