Presence and Immersion

(Zeltzer, 1992)

Taxonomy of Graphic Simulation

- Autonomy
  - Computational models of objects and processes.
- Interaction
  - Means to modify the states of these models.
- Presence
  - Mediating channels that allow participants to experience the simulated events.

Autonomy

- Qualitative measure of the ability of a model to act and react to simulated events.
- One extreme
  - Passive geometric data structure with no associated procedures.
- Other extreme
  - Virtual actors capale of reactive planning.

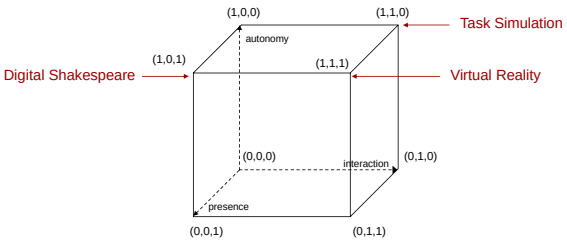
Interaction

- Paradigm varies
  - Depends on at what level of abstraction one accesses the model parameters.
- Direct access
  - Not necessarily productive!
- The right access
  - Degrees of freedom problem.
  - All about understanding the functional relationship among input parameters.

Presence

- Sense of being in and of the world
  - Emerges from a “bath” of sensation.
- Meaningless unless we specify
  - The application domain.
  - The task.
- We need to specify (“selective fidelity”)
  - Present where?
  - For what purpose?

The AIP Cube



The AIP Cube

- Ultimate Virtual Reality (1,1,1)
  - may represent an unattainable node.
- We have pursued it through millennia!
  - New electronic tools are merely tranforming the medium.

(Ijsselsteijn and Riva, 2003)

Mediated Environments

- Escape from reality...

  ...to be able to do anything one may desire to do, and go anywhere one wishes – seems to be one of the basic motivations behind the appeal of media in general, and the fascination with virtual environments in particular.

Mediated Environments

- Illusory shift in point of view
  - Displacement of the participant's self-perception
  - Sense of transparency of the medium

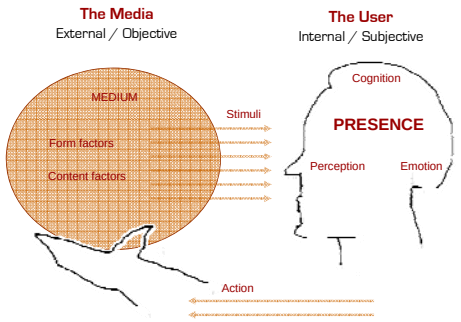
Mediated Environments

- The feeling of "being there", or "presence"
  - Not intrinsically bound to any specific type of technology.
  - It's a product of the mind.
  - We are seldom aware of it.
- With Immersive media
  - It becomes relevant.
  - What causes presence, how can it be measured and what's the effect on users?

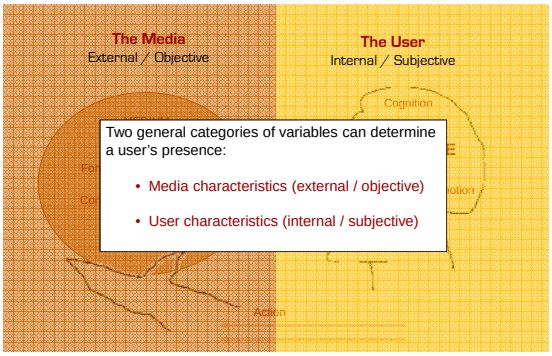
Complexity of Presence

- The consensus about presence
  - It is a complex, multidimensional perception formed through an interplay of raw (multi-) sensory data and various cognitive processes.

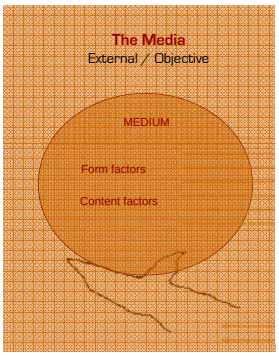
Structure of Presence



Structure of Presence: Media vs. User



Structure of Presence: The Media

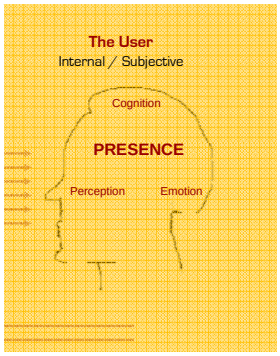


- Form
  - The extent of sensory information.
  - The level of control over sensory mechanisms.
  - The ability to modify the environment.
- Content
  - Objects, actors and environment tied together into a logical flow of events: Narrative or Story.

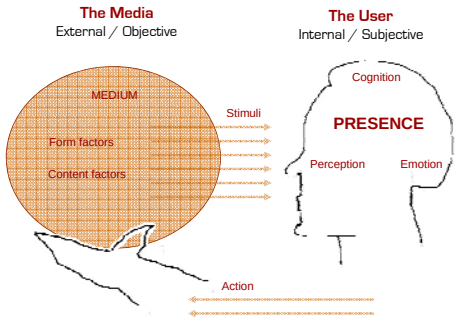
Structure of Presence: The User

- Cognition
  - Goals, Preferences, Memory...
- Perception
  - Attention, Expectation, Recognition...
- Emotion
  - Feeling, Attitude, Alertness...
- Personal traits:

  Gender, Age, Personality...



Structure of Presence



Classic Presence Research

- Teleoperation
  - Remote operation of real equipment
- Training Simulation
  - Operation of virtual equipment
- Telecommunication
  - Virtually getting together

Presence vs. Immersion

- Presence
  - "A perceptual illusion of nonmediation" (Lombard and Ditton, 1997)
  - ... continuous responses of sensory, cognitive and affective processing systems to objects and entities in the environment.
- Immersion
  - Description of overall fidelity of the stimuli / action channels.
  - May affect "Presence".

Culture rather than immersion?

- The cultural or social context
  - Shared cultural codes that allow us to interpret our environment.
- The cultural approach to Presence
  - Focuses more on the actions afforded by the environment within a social context.
- The cultural reality of experience
  - Defined relative to functionality, rather than to appearances.

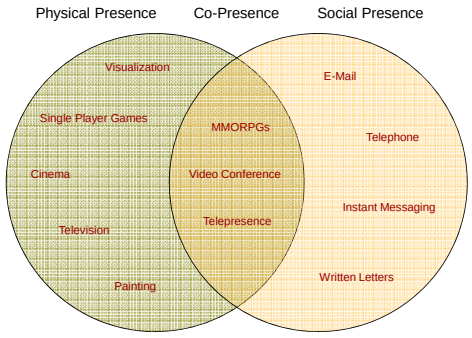
- ~ 70 % of MUD users feel a sense of presence!

Types of Presence

- Physical Presence
  - Physically located in a mediated space.
- Social Presence
  - Being together with a remote partner.

- Co-Presence
  - Being together in a shared space.

Types of Presence



Designing for Presence

- Design to serve a purpose
  - Must be designed with intended users' tasks and goals explicitly considered.
- Must support flow of action
  - During the experience, the knowledge relevant to the goal should be shared, and actions supported and coordinated.

Designing for Presence

- Ultimately about the users' experience
  - And how the users respond.
  - Regardless fidelity of simulation technology.

Importance of Presence

- Research into presence is important
  - As is research into other user-centered concepts.
    (e.g. usability, flow, affective responses)
  - Moves beyond technology-pushing.
  - Asks about purpose and context of use.

References

- Zeltzer, D. (1992) "Autonomoy, Interaction, and Presence", PRESENCE 1(1), MIT Press
- Heeter, C. (1992) "Being There: The Subjective Experience of Presence", PRESENCE 1(2), MIT Press
- Ijsselsteijn, W. and Riva, G. (2003) "Being There: The experience of presence in mediated environments", Being There: Concepts, effects and measurement of user presence in synthetic environments, Riva, Davide, Ijsselsteijn (Eds.), Ios Press
- Min Lee, K. (2004) "Presence, Explicated", Communication Theory, 14(1), ICA

Extra Material (other work)

(Heeter, 1992)

Dimensions of Presence

- Same process as discerning and validating the existence of self in the natural world.

Dimensions of Presence

- Personal Presence
  - Why you feel like you're in another world
- Social Presence
  - Other beings exist and appear to react
- Environmental Presence
  - Environment appears to react

Personal Presence

- In immersion VR, real world perceptions are simulated. Seeing your own hand or body in there helps as well.
- In second person VR, rules have changed and "seeing is believing". Crucial to see "yourself" in the environment and believe the interaction.
- In both cases, familiarity with the world helps.

Social Presence

- If others ignore you, you begin to question your own existence.
- The “social construction of reality” is strong.
- The “others” may not be other people like you!

Environmental Presence

- The environment confines your movement.
- The environment can actually move you around with it.
- You can modify the your environment.
- Can the VE create an even stronger Environmental Presence than the real world?