

## Presence in Media Environments

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STU School Human Technology Interaction, Almen, 26 January 2009

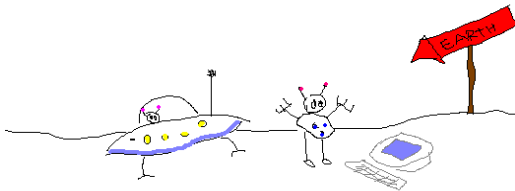


- Background in artificial intelligence and cognitive neuropsychology (Utrecht University)
- PhD in HCI/media psychology 'Presence in Depth'
- Associate professor at Human-Technology Interaction group at TU/e
- Research interests include immersive media and embodiment, social digital media, and digital games.

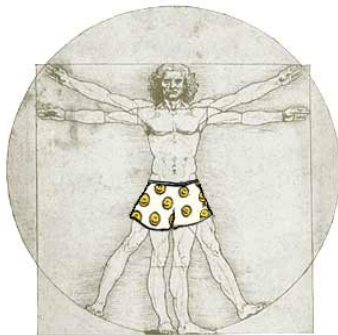
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### Imagine 10,000 years from now....

What would a team of Martian paleontologists and archeologists deduce about our species when encountering the remnants of our information society, i.e., a desktop computer?



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## Presence

- Presence is most often succinctly defined as *the sense of "being there"* in mediated environments
- Understanding this experience has become a central problem in new media research because it may *characterize the phenomenal experience of users when "media work"* and may be a key feature of users' *optimal experiences* with media – i.e. transparency; directness; the 'perceptual illusion of non-mediation'.
- Presence serves the scientific function that perceptual illusions have had since long – it makes us challenge the assumption that the physical and perceptual world are one and the same

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## Media Environments: Cyclotrons of the Mind

- “Advanced media environments may be to the mind, like cyclotrons are to physics....The study of presence can be seen as the study of those traces of phenomenal experience that emerge when brains and bodies are whirled through virtual spaces created by media. By tracing those patterns that we call presence, we may come to understand something fundamental about mind and media, neuron and silicon.”

— Frank Biocca (2003)

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When anything new comes along, everyone, like a child discovering the world, thinks that they've invented it, but you scratch a little and you find a caveman scratching on a wall is creating virtual reality in a sense. What is new here is that more sophisticated instruments give you the power to do it more easily.

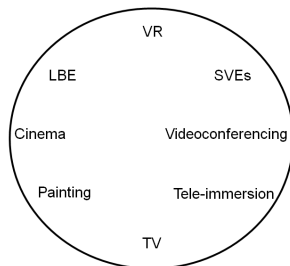
Virtual reality is dreams.

— Morton Heilig



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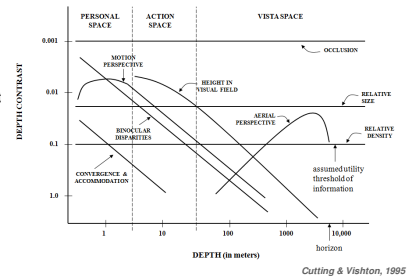
## Physical Presence Sense of 'Being There' in a Mediated Environment



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## Some perceptual criteria of reality

- Static depth information is provided via several independent mechanisms (depth cues) that are consistent with each other and the observer's viewpoint.



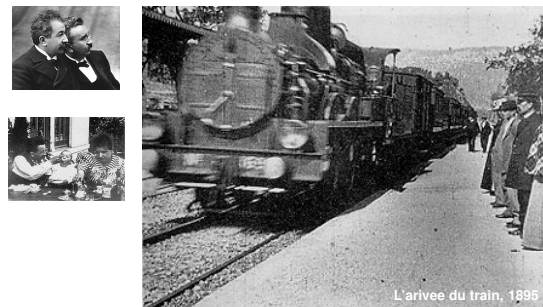
Cutting & Vishton, 1995

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- The effective image size fills our entire field of view, limited only by our facial structures, but without an externally imposed frame.
- The resolution and intensity of the image is only limited by the sensitivities of our visual system.
- Dynamic depth information (i.e. movement parallax) is coupled to observer motion in real-time



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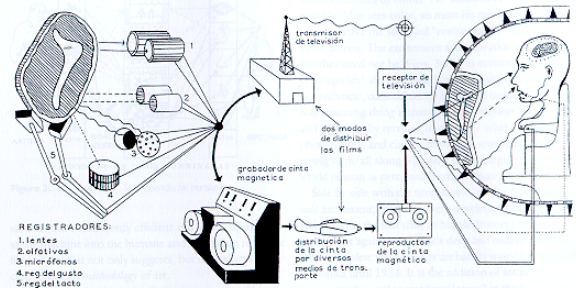


"The biggest new entertainment event of the year." - LIFE

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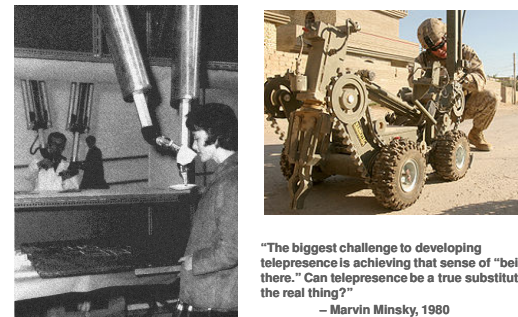
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"The biggest challenge to developing telepresence is achieving that sense of "being there." Can telepresence be a true substitute for the real thing?"  
— Marvin Minsky, 1980

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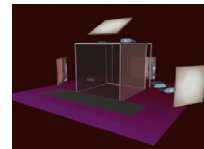
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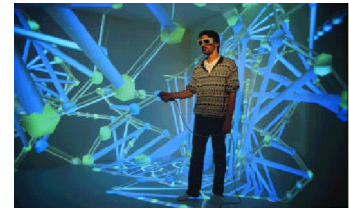
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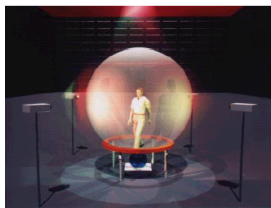


4-sided and 6-sided CAVEs



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CyberSphere (1998)



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## Social Presence

"The degree of salience of the other person in the interaction and the consequent salience of the interpersonal relationships" – Short et al., 1976

"Social presence can be thought of as whether or not there are social cues that signify the presence of others within some interactional context." - Swinith & Blascovich, 2002

"Sense of being with another person"



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"Do come over!"



- Contact and communication are fundamental human needs
  - Survival value
  - Health effects
- Face-to-face contact allows for paralinguistic communication through eye contact, body posture etc.
  - Critical in negotiation and persuasion, establishing trust and rapport
- Effective visual communication is essential for human productivity

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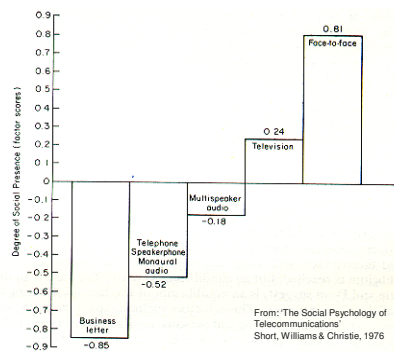


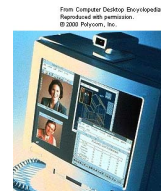
Figure 5.3 Social Presence of several communications media.

From: 'The Social Psychology of Telecommunications' Short, Williams & Christie, 1976

## Traditional videoconferencing

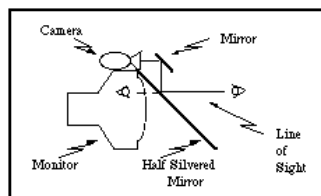


- Small size image
- No gaze directional information:
  - Who's talking to whom?
- No eye contact
- Poor body language, posture information
- Latency issues



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## Simulating eye contact: Reciprocal video-tunnel



Buxton (1992)

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## Multi-party conferencing



Buxton (1992)

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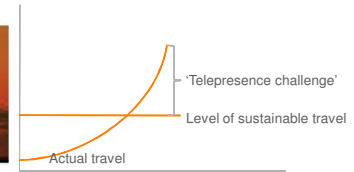
## Rationale for telepresence

- **Hard Dollar or Euro costs**
  - Airline tickets
  - Hotel, dining,
  - Taxi, rental cars, public transport
  - Cost of time while in transit
- **'Soft' costs**
  - Cost of wear-and-tear on people (i.e., travel is hard physically, stressful, and especially inconvenient for families),
  - Loss of productivity through being inaccessible to colleagues,
  - The lack of availability of resources and information while travelling,
  - 'Opportunity cost' – opportunities you normally would have had or created if you had been available to your colleagues, your clients, and your team, and not in transit or jet-lagged.

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## Rationale for telepresence (cont'd)

- **Environmental costs**
  - A smaller ecological footprint (in terms of resource consumption and waste production) is critical



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## Developments in Telepresence

- **High definition audio and video**
  - Video is HD, with large, lifesize projections of participants; careful control of the distances between screens, cameras, and chairs.
  - Audio is clear, without noise, intelligible, echo-free, and of sufficient volume; multi-channel audio sometimes provides directional cues
  - No A/V asynchrony (in theory...)
- **Improved usability**
- **Dedicated networks, high reliability, low latency**
- **Dedicated environments which enhance the presence illusion**
  - Symmetrical furniture, lighting, wall paint colours
  - Tables designed to merge into the display

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## Cisco CTS 3000 TelePresence System



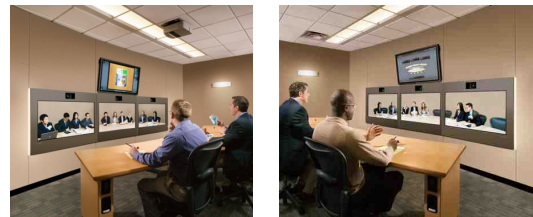
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## Polycom Real Presence eXperience (RPX)



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## The HP Halo Collaboration Studio



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## Teleportec



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## TelePresenceTech



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## Conclusion

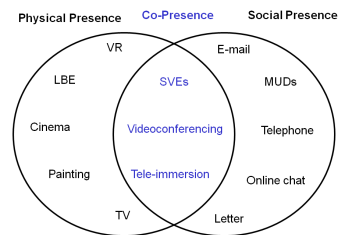


- Commercial teleconferencing systems have gone through a phase of rapid innovation over the past 5 years
  - Immersive, HD displays, supporting eye contact & body language to an extent
  - High-end solutions claim to deliver "true" presence
  - However: Expensive to implement and maintain, little interoperability, limited user base (Metcalf's law)
- Still early days, but productivity gains and cost savings seem real
- What are the current limits of telepresence systems? Can they still be improved?
  - 3D, eye contact, interaction, virtual touch

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## Current Research

- Mix of communication and VR technologies
  - Multi-camera reconstructed views
  - Motion parallax support
- Mediated social touch



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## National Tele-Immersion Initiative



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## Berkeley's MultiView system



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## EC FP7 3DPresence project



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## Open questions

- n Focus on social presence as a means to an end, not a goal in itself
  - Collaboration/negotiation outcome (quality) and satisfaction,
  - Interpersonal relationship building,
  - Trust, persuasion, deception
  - Intercultural differences
- n What are social psychological and societal implications?
  - Privacy, productivity
  - Chance encounters, informal communication



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## Contact me

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