

Access Grid and Video Conferencing as Real Life Simulation

Dr Mary Allan and Prof David Thorns
eResearch Australasia 2007

26-29 June 2007

Brisbane



Introduction

- This presentation is based on a pilot study leading into a current two year project funded by the New Zealand social science research network BRCSS, and the REANZ Capability Building Fund. Both agencies work towards enhancing collaborative research networks, REANZ by providing KAREN the high speed internet connection infrastructure, and BRCSS by supporting links between researchers nationally and internationally
- Collaboration among scientists is a goal sought after by the New Zealand government aspiring to advance the country's ability to compete in the global knowledge economy.
- The project explores precursors for evaluating collaborative knowledge creating environments in technology mediated virtual spaces and networks.



Working in Collaboration

- Today's work and research arena are dominated by collaborative activity, induced by the growing complexity of products, projects, and services. Rogers & Geisler(1997) argue that this requires collaborating across disciplines and incorporating specialists to create multidisciplinary teams
- Wainfan & Davis(2005) suggest that collaborative activities increasingly take place in the virtual, as more people who need to collaborate in some form in order to do their work are geographically disperse.
- Communication in today's circumstances relies on mediated rather than face-to-face (F2F) communication, to allow for multidisciplinary teams located at different geographic sites



Face-To Face Versus Video Mediated Collaboration

Research findings are ambiguous about the effectiveness of video mediated collaboration.

- The common belief is that the technology cannot replace F2F interactions (Hauber et.al 2006;. Wainfan& Davis 2005) mainly because it cannot provide the richness of information exchanged in a F2F interaction, or quoting President Bush: “Look them in the eye”.
- Contrary to this opinion, study conducted by Vinsonhaler et al., (1998) suggests that video conferencing provides at least a good basis for collaboration as would F2F.



Theoretical Framework

- AG environment is designed to enable human- to-human communication, and indeed, these are the obvious actions occurring in them.
- However, AG environments are mediated spaces featuring video-cameras, microphones, furniture, room décor, and node operators
- Latour(1988) argues that these are invisible ‘third party’ agents present in any social interaction.
- Latour suggests that human and non-human agents are acting, exchanging things, and imposing their aims, redefining and complicating social relations.



Agents interrelating in AG Environment

- Participants
 - Furniture
 - Cameras
 - Microphones
 - Printed material
 - PowerPoint presentation
 - Node operators/technicians
 - Software
 - Hardware
 - Computer network
- Technological breakdowns also play a role in shaping the events, people's experience, and the way they relate to the medium
- All these interrelate creating relations and interdependencies, which are a construct of the role of the agent and its position, accessibility, and visibility
- The human and non-human participants, and their interrelatedness and constructed roles are creating spaces potentially enabling collaborative knowledge creation

Aim of Study

- Investigate the ways in which interactions between human and non-human agents contribute (or hinder) the creation of simulated F2F spaces
- Evaluate the features of simulated F2F as possible precursors for supporting the creation of **spaces** that would facilitate collaborative creation of knowledge

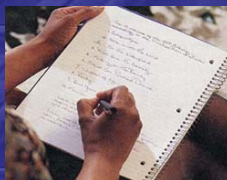
Population of Study

- Staff and postgraduate students attending virtual seminars broadcast via Access Grid across NZ universities
- BRCSS network management meetings
- Collaborative teaching across two NZ universities
- Collaborative project debate involving various community representatives



Method

- Data collection included observations of Access Grid (AG) sessions, seminars and cross- site teaching sessions.
- Notes taken by the observer during each session were the only documentation of the observations.



This limitation was due to the narrow bandwidth available prior to the launch of KAREN. The low bandwidth available could not support any recording, storing, or use of annotating and other analytic software.

Structure

- **Simulated F2F** - Juxtaposing the components of F2F and their simulated counterparts in a mediated environment such as Access Grid
- **Presence and co-presence** in real and mediated environments
- **Real and Virtual spaces-** simulating the real in the virtual



Simulated Face-to-Face

From
Face-to-Face
To
Mediated Spaces of Interactions



Constructing Spaces of Face-to-face Interactions ¹²

- Physical proximity
- Posture
- Orientation
- Language and speech
- Patterns of looking at the other (Gaze)
- Bodily movement
- Facial expression

Constructing Mediated Spaces of Interactions

- Images of F2F interactions
- Camera movement
- Microphone/s
- Furniture in the AG/VC facility
- Room décor
- Group size

Mediating Constructs of F2F

	Face –to- face	Mediated (Mixed Spatial) Reality	
		Physical	Virtual
Physical proximity	Distance between self and others Choice of seating arrangement	Choice of seating arrangement, use of furniture i.e. high/low tables, = distance	Choice of distance from mic and camera distance in virtual
Posture- revealing status and hierarchy	Relaxed posture=higher status Formal sitting= lower status (Goffman in Argyle and Kendon,1967)	Similar to F2F Choice of furniture- higher status – coffee table lower status – desks	Choice of prominence of positioning in front of camera
Orientation	Angle in which people relate to each other, and also positioning the furniture they are using	Angle in which people position themselves in relation to people in the room	Positioning in relation to visual images of people in other nodes
Gaze	Looking at each other – a social act Seeing each other offers important information about one another	Gazing at other people in the physical node	Gazing at the camera transmits one's gaze to the mediated environment, creating sometimes unintentional 'meeting of the eyes'

Because of the inability to record we are only referring to these aspects



Room Décor

- Standardising the décor of all nodes was thought to contribute to the feeling of unity across the various nodes, creating a sense of a single environment.
- However the notion was not realised as nodes were developed at different times and varied in their structures as some were specifically built for AG and some serve multiple purposes



Group Size

- Physical and virtual group size has implications for the ability of participant to communicate.
- In virtual spaces group size implication are enhanced by the constraints of the mediated environment – i.e. range and flexibility of movement of cameras and microphones. Providing accessibility to mics and camera are crucial for communication in this environment



F2F and Mediated Communications



Both require visual interaction and a sense of mutuality of space, orientation

Presence and Co-presence

Interactions in Mixed Spatial Realities
(Real and Mediated Environments)

To support collaborative activities participants need to feel a sense of togetherness



The Concept of Presence

- **Presence:** A sense of “being there” - Heeter(1992) distinguishes between three different types of presence
 - **Personal presence-** the extent to which a person feels part of the environment
 - **Social presence-** the extent to which others (human and non- human) exist in the environment
 - **Environmental presence** – the extent to which the environment acknowledges and interacts with the participants



Presence observable in AG -1

Type of Presence	Presence in AG Sessions
<p>Personal presence- the extent to which a person feels part of the environment</p>	<p>Visual image of self - when local node's image was projected people felt part of the environment . When image was not projected participants noted that they felt excluded</p>

Presence observable in AG -2

21

Type of Presence	Presence in AG
<p>Social presence - the extent to which others (human and non-human) exist in the environment</p>	<p>1) When microphones were muted people perceived the social presence to be that of their physical /local space</p> <p>1a) Mmuting of microphones was perceived by participants as a way of becoming 'invisible' and became unaware of the effect their body language and facial expressions may have on people sitting in other nodes</p> <p>2) Some presenters used the muting of microphones for creating a local social presence, working in local groups</p> <p>3) when self image was not available, some very informal behaviour appeared, i.e. yawning, or leaving the room with no reference to the projected nodes, frequent attention to person present in the room but invisible to the camera for example participator talking to node operator who is off range of camera</p>

Presence observable in AG -3

Type of Presence	Presence in AG
<p>Environmental presence – the extent to which the environment acknowledges and interacts with the participants</p>	<p>1)The introduction of the participants of each node to the other nodes created an environmental presence. Example: On occasions where one node was active and the rest were invited to listen in , no introductions were made, as if obscuring the environment surrounding the active node.</p> <p>2)Control over camera when given to chair person – camera movement acknowledged changes in the session and was made to respond accordingly</p>

Co presence:

A sense of “being there together”.

- **Co- presence:** In mediated environments as in F2F, the ability to communicate and interact was the primary variable in supporting co-presence
- Seeing one’s self is not part of the communication act in f2F however, the study shows that this feature plays an important part in the reality of the AG.
- Interactions in AG sessions go beyond the physical to connect with conversation partners represented only via their projected images.
- This creates a sense of Mixed Spatial Reality in which video images create virtual spaces which are displayed to the participants as part of their physical node environment as visual images taking up space in the physical room



Real and Virtual Spaces



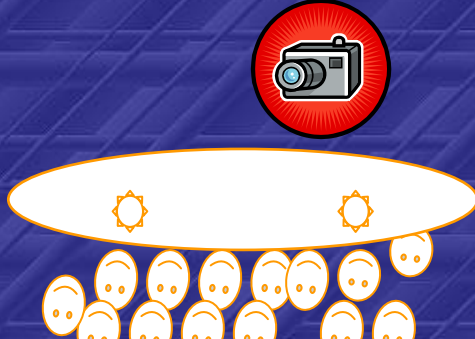
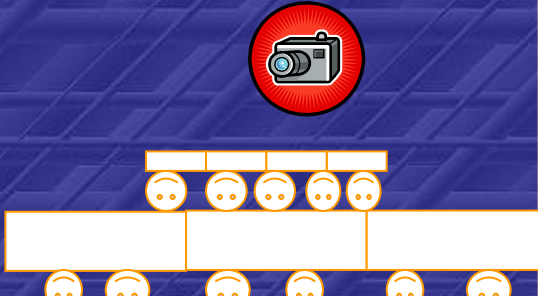
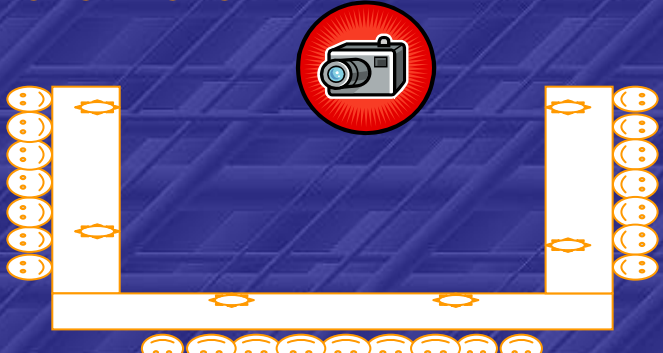
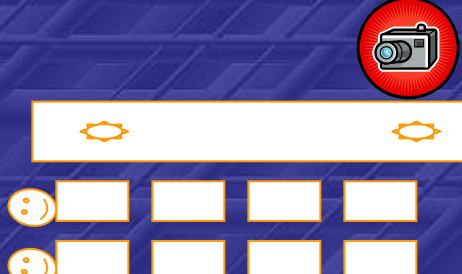
Space in Cyberspace

- McGregor(2004) argues that spaces are socially produced, and suggests that the nature of the space informs our understanding of the social interactions they entail.
- Building on McGregor's theory, we argue that social spaces are produced by social dynamics, and that by looking at social dynamics we may be able to identify instances of collaboration

In this section

we investigate how seating arrangements affect social dynamics

Positioning of Seat and Cameras

<p>Facing the camera</p>		
<p>Facing other people in the physical environment</p>		
<p>Facing away from the camera and each other</p>		

Proxemic behaviour

Use of furniture to express hierarchical status and level of involvement

High levels

Proximity to camera and mics- revealing high level of hierarchy and involvement – for example:

- Choosing to sit at the low table, positioned closer to the camera and mics, and exposing full body rather than showing head and shoulder.
- Talking mostly on to the screens (feed made self visible) and sometimes turning back to respond to people in the physical room. Feeling very comfortable expressing informal behaviour (and humour), which in F2f is interpreted as posture expressing higher status

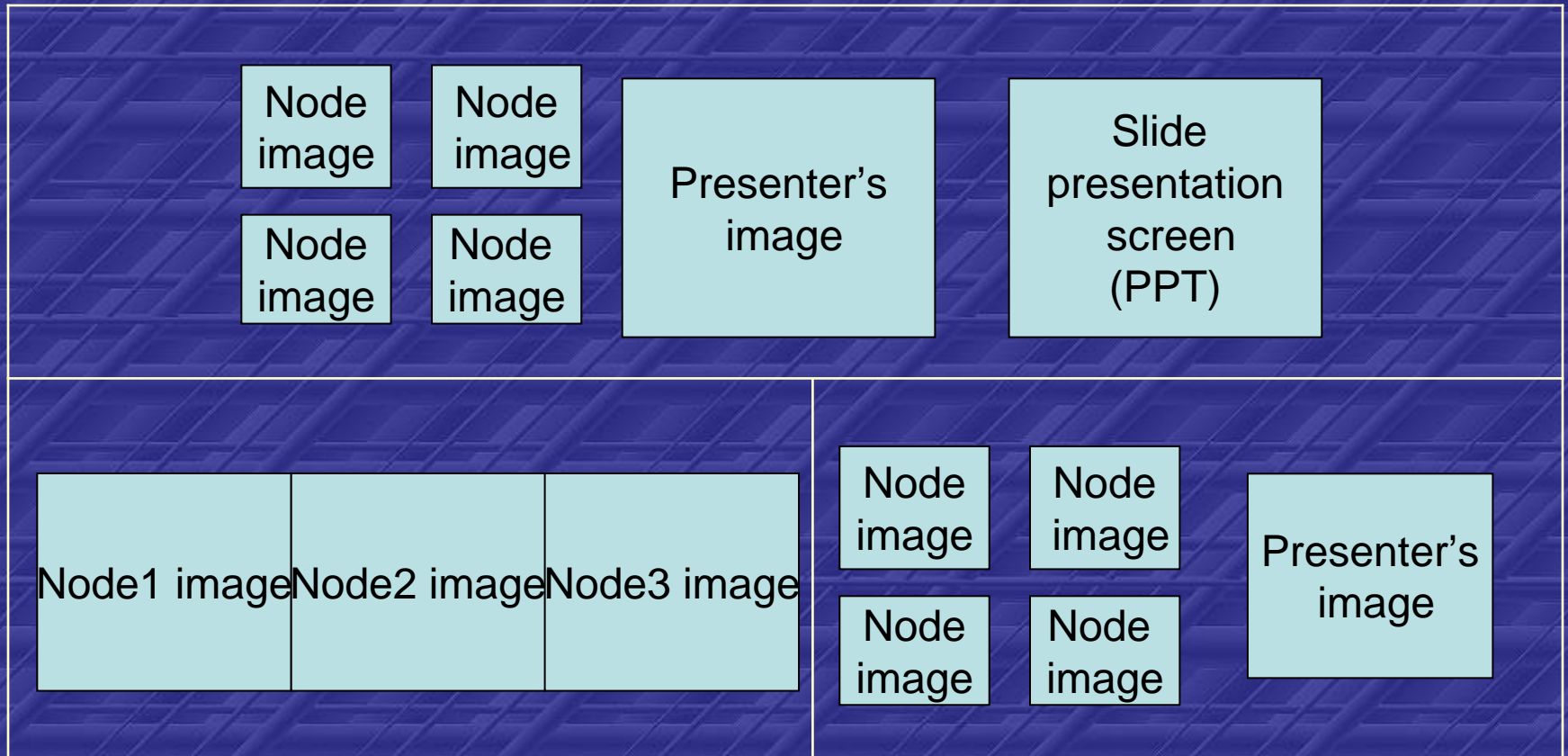
Low levels

- Node operators- sitting behind their computer screen, as though hiding behind it
- Often engaged in things other than the AG session, therefore exhibiting low involvement

Key Points Arising from Positioning Models ²⁸

- Exposure to camera -Connectivity to non- physical (Virtual) nodes
 - Low coffee tables allowed for direct contact through unblocked visual image projected by the camera.
- Positioning of furniture -Connectivity within the physical node.
 - horse shoe model offered best visibility of participants within the physical
- Proxemic behaviour – positioning in the physical and in relation to meditating tools- camera and microphones create different hierarchies and levels of involvement

Size and Positioning of Projected Images- Creating the Virtual



Local versus virtual

- When talking to others present in the physical location people tend to face their interlocutor rather than the camera
- View of video image of local environment has some effects on participants' behaviour. In most cases seeing one's self added to the feeling of co-presence
- When self image was absent people leaned towards the microphone as though to ensure their words get to the 'other' location, from which they are absent
- In general, the node hosting the presenters attracted the larger number of participants.
- Hosting node phenomenon exceeded the local in one case. One of the presenters relocated to another university, however, his mates and former students in the old university crowded the node at the old university, and cheered the presenter now physically remote from them or is 'virtually present'



Virtual as Local

- Mediated communication is not the only way to create a virtual space
- Locality is achieved when participants communicating over the mediated space know each other prior to the mediated encounter
 - A group at one node spotted a colleague sitting at another node. This prior acquaintance allowed for the forming of a short informal hearty alliance. This alliance generated an atmosphere different to the one expressed by the rest of the participants



Space as a social construct

- Positioning of human, and non-human as well as projected images implies roles and hierarchies as observed through proximity.
- This can be further developed to perceive proximity as defining position in forums of power or as Bourdieu would call this – a 'Field'. Fields could be structured by habitus – mental perceptions of situations (constructing roles)



AG Social Space as constructed through:

- Positioning of seats and camera
- projection of video image of self
- Camera movement following speakers
- Access to microphone (related to group size, and positioning of furniture)
- Mode of microphones – open or shut- shutting microphones shuts out others (in other nodes)
- Size and position of projected images
- Video view of the physical local space



Summary

- **Communication in the virtual as in the physical is reliant on the ability to see and hear each other . The means of achieving this differs in physical and virtual**
- **Communication is about visual presence which allows for co-presence–**
- **In mediated communication, presence is a construct of human and non human agents all interacting in the creation of a spatial environment that will enable smooth uninterrupted communication in a ‘Mixed Spatial Reality’ in which the physical and the virtual interact simultaneously**
- **AG environments create Mixed Spatial Realities of projected video images creating virtual spaces displayed as part of the physical local environment**



Further Questions for Investigation

35

- Is sense of locality created by the projected screens, reflects an undisturbed environment – or is a virtual divide being created?
- Is there a sense of exclusiveness and inclusiveness in the absence of self image?
- Does communicating through video screens create Co- presence?
- Where does the physical end and the virtual begin? Is co- presence obstructed by this virtual divide?
- Is there a correlation between context of sessions and the nature of dynamics of interactions they generate?
- Do AG sessions act as triggers for further communication- do they spawn networks in other mediated communication environments?
- Are there differences in perceptions of collaboration and the willingness to cooperate between different sectors, academic disciplines, academics and practitioners?
- How do the virtual spaces contribute to the creation of knowledge?
- What methods are needed to explore the relationship between virtual communications and knowledge creation?
- How are the virtual communications affecting research methods and the creation of new knowledge?



Questions? Comments?

