Video Streaming: Remote Participation and Engagement in the Conference Environment

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Outline

1. Motivation
   - Background
   - The Technical Infrastruture
2. Implementation
   - Literature Review
   - Implementation Choices
3. Results
   - Feedback
   - Conclusion

The Community

- Institutional Web Managers Workshop (IWMW)
- Members from very diverse backgrounds and institutions (HE, FE, Museums)
- Formed around the roles of members with UK institutions
- Limited interaction between members, only on ad hoc basis
- Members fairly technically savvy
- Keen to try out new technologies

The Event

- Yearly event since 1997
- Exchange of ideas
- Evolution of trends
- Networking
- Social activities

The Challenges

- limited available hardware
- no budget to buy purpose built system (hardware or software)
- possible to reimplement by small institutions or departments

Available Hardware

- one laptop with bluetooth and mobile SIM card
- one borrowed desktop with firewire port running Linux (mine)
- one miniDV video camera
- one tripod
- UKOLN existing web server (Sun Fire v40z) running Linux
- University of Bath network infrastructure

Available Technologies

- Synchronous
  - IRC (Internet Relay Chat)
  - Videoconferencing
- Asynchronous
  - Video Streaming
  - SMS
  - Bluetooth Messaging and File Transfer

Definitions of Presence

- The sense of being part of an environment – Freeman et al, 2001
- The defining experience for virtual reality – Steuer, 1992
- Aim: the context and activity should seem familiar – the technology unobtrusive.

What breaks the user experience?

- Gaze and gestural information lost
- Little information available for turn-taking
- Out-of-sync or degraded audio
  - Synchronisation information important for repair
  - Loss of sync causes perceptions such as speaker less credible, or slow

What doesn't?

- Bandwidth economies for video
  - Relatively low framerate
  - Relatively low video quality, if synchronised correctly to audio
- Some problems irrelevant in context
  - Turntaking is minimised in conference context
  - Formalised environment $\longrightarrow$ ad hoc interaction minimised

Synchronous Video Conferencing

- provided by Rob Bristow (Uni. of Bristol) and Mark Lydon (I2A Consulting)
- using AccessGrid based technology
- required software and/or specialised hardware

Open Source Alternatives

- full linux based environment
- Audio codec used : vorbis
- Video codec used : theora
- multimedia envelop : ogg
- streaming server : icecast
- other possibilities :
  - simultanous multiple format streams (SWF, WMV, OGG, RM)
  - using ffmpeg/ffserver for encoding and streaming
- choice made considering uncertainty of bandwidth availability.

Implementation concerns

- Cost – a shoestring budget
- Intellectual property and preservation issues
- Accessibility to the casual viewer – widely-supported codecs
- Not much consensus on interoperable technologies. . .

Ad hoc community

- Videoconferencing audience agreed ahead of time
- Fear of scalability issues caused us to (unnecessarily!) limit participation
- Video streaming audience resulted from a small amount of last-minute advertising (mailing list)
- Page contained details of IRC network, etc.

Social/legal issues

- Requirements of the Data Protection Act
- Remote participants not identified/identifiable — limiting would produce 'walled society'
- Possibility of real-time recording of video stream
- Video is stressful : feeling under surveillance
- Contributor's remorse (or organiser's remorse) :
  - I said what?
  - We can't publish that on the logs!

User Feedback : Videoconferencing

- Uncomfortable sensation of being watched
- Conference 'mood' missing, thus :
- Inconsistent with conference environment
- Good technology but not entirely appropriate in a conference context in which audience participation is not requested

User Feedback : Video Streaming

- Video Stream helped remote users but space for improvements
- Single IRC back channel was still very much used, with more participation from remote users
- IRC feedback channel also used for community repair ('what did he say?')
- availability of parallel incoming and outgoing asynchronous technology increased sensation of involvement
- Still hearing from remote participants — lots of enthusiasm
- But : accessibility issues in video streaming.
- Good camera work made the session 'come alive'

Documenting after the event

- Multimedia to be marked-up ie. with SMIL?
- Projects like ILRT's IUGO looking to index user contributions relating to conferences/workshops (moderated SW approach)
- Web 2.0/community-based approaches : tagging related resources, collecting blog pingbacks/trackbacks
- Linking multimedia information to user-contributed resources; information 'trails'

Future work

- Near real-time linking of dissimilar channels
- Establishing ‘information trails’ or ‘narratives’
- Exploring real-time community multimedia annotation across low-bandwidth feedback channels
- experimenting with different camera angle
- experimenting with picture-in-picture with simultaneous multiple view points (small icon size of speaker in close-up, and full frame of slides)
- improve sound capturing

The End...

Any Questions?

For Further Reading I

M. Chen
Conveying conventional cues through video.
Dissertation, *Stanford University*, 2003.

J. Wegge.
Communication via Videoconference : Emotional and Cognitive Consequences of Affective Personality Dispositions, Seeing One's Own Picture and Disturbing Events.
Human–Computer Interaction, 21(3):271–318, 2006.

S. Whittaker and B. O'Conaill.
The Role for Vision in Face to Face and Mediated Communication.
Video–Mediated Communication, (Eds. K. Finn, A. Sellen, and S. Wilbur), Lawrence Erlbaum Associates, 23–49, 1997.

For Further Reading II

J. Freeman, J. Lessiter, and W.A. IJsselsteijn.
An introduction to presence : A sense of being there in a mediated environment.
The Psychologist, 14:190–194, 2001.

J.S. Steuer.
Defining virtual reality : Dimensions determining telepresence.
Journal of Communication, 42(4):73–93, 1992.