Mediated Communication

Michel Beaudouin-Lafon
Université Paris-Sud

Thanks to Nicolas Roussel, INRIA

How do you communicate?

Face-to-face
Mail
Telephone
Email
Instant messaging
Texting
Video conferencing

Other?

From telephone to picturephone

1876: Graham Bell invents the telephone
1882: Du Moncel presents the “téléphote” to the French Academy of Science
1927: First television transmision in the US

AT&T President Walter Gifford in New York (left) watches the moving image of Secretary of Commerce Herbert Hoover (right) in Washington, D.C., during the first demonstration of television transmission in the United States, April 7, 1927 (source : AT&T)

From telephone to picturephone

1964 World's Fair: “Survey results indicated that most people did not like PicturePhone. The equipment was too bulky, the controls were awkward and the picture was small.”

2001 (Kubrick & Clarke, 1968)

1992

Videoconferencing rooms

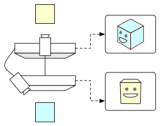
Great hopes

DVE

Polycom

Great disappointment

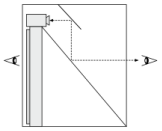
- Expensive
- Technical problems: sound, eye contact



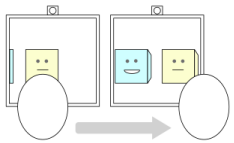
Some solutions

Video:

- Eye-contact with a silver-mirror
  - *Video Tunnel, Buxton & Moran, 1990*

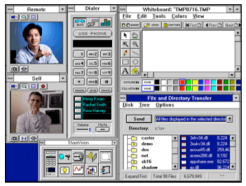


- Explore remote space by head motion
  - *Video window, Gaver et al, 1995*



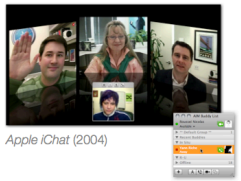
- Multiple views
  - *Hydras, Sellen et al., 1992*

From room to desktop videoconferencing



Creative Labs Share Vision (1997)

Microsoft NetMeeting (2002)



Apple iChat (2004)

What are these systems for?

Supporting synchronous one-to-one conversation with a beginning and an end?

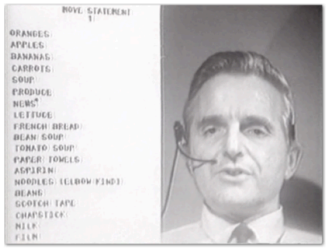
OR

Supporting communication while working on shared artifacts?

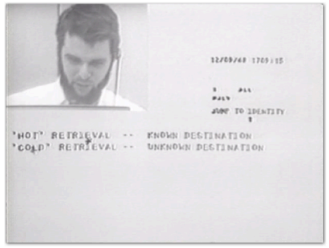
OR

A way to share presence of one or more other people?

Communicating about shared documents

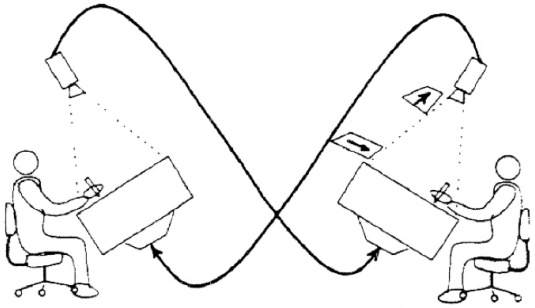


A Research Center for Augmenting Human Intellect
(Engelbart & English, 1968)



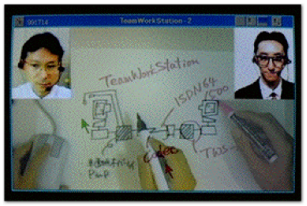
VideoDraw (Tang & Minneman, 1990)

Simple video sharing of a drawing surface



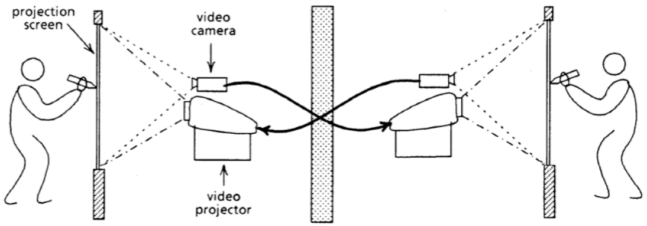
TeamWorkstation (Ishii et al., 1990)

Sharing a drawing tool with inset video streams



VideoWhiteboard (Tang & Minneman,1991)

Larger drawing surface, an overlaid shadow of the whole body rather than just the hand



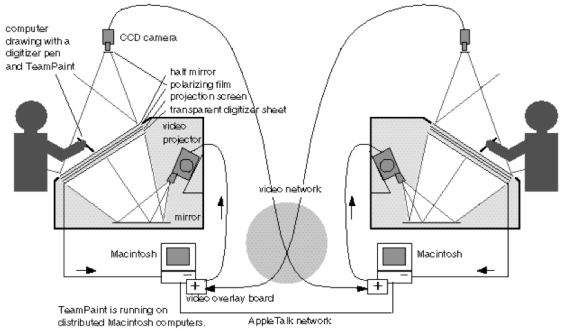
ClearBoard (Ishii et al., 1992)

Overlays image of other participant with shared surface
Eye contact + Gaze awareness

Concept tested with a prototype
Limited to 2 people

ClearBoard (Ishii et al., 1992)

A complex system



HyperMirror (Morikawa et al., 1998)

Mirror vs. transparent window: I see myself in the remote scene

The power of video communication

Instant recognition of the ability to communicate

Hole in Space (Galloway & Rabinowitz, 1980)
3-day audio-video link between Lincoln Center in New York and Century City in Los Angeles

From formal to informal communication

Formal communication:
- Planned in advance, with an agenda and a list of participants

Informal communication:
- Unplanned, spontaneous, serendipitous, open

Most often, both coexist

Media Space (Stults & Harrison, 1985)

Permanent audio & video link between the commons area of the office space of two parts of the same research group, in Portland and Palo Alto

People could not always tell if they had seen the person locally or remotely

VideoWindow (Fish et al., 1990)

"*Imagine sitting in your work place lounge having coffee with some colleagues. Now imagine that you and your colleagues are still in the same room, but are separated by a large sheet of glass that does not interfere with your ability to carry on a clear, two-way conversation.*"

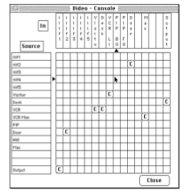
Analyzed 160 hours of video:
- Fewer conversations
- Hard to reciprocate
- No privacy (side conversations)
- Poor eye contact

A collection of mediaspaces (1990s)

VideoWindow and Cruiser (BellCore)
RAVE & KASMER (Xerox), Cavecat (U. Toronto)
Argo (DEC), Montage & Forum (Sun)
Georgia Tech, U. Calgary, U. Paris-Sud, U. Grenoble, …

Exploration of services:
Mirror, Glance, Videophone
Office share, Awareness view
Vision-based services
Collaborative services
…

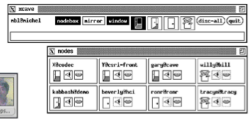
Mediaspaces: user interface



CAVECAT (University of Toronto)

RAVE (Xerox)

Montage (Sun)



KASMER (Xerox)

Ontario Telepresence Project

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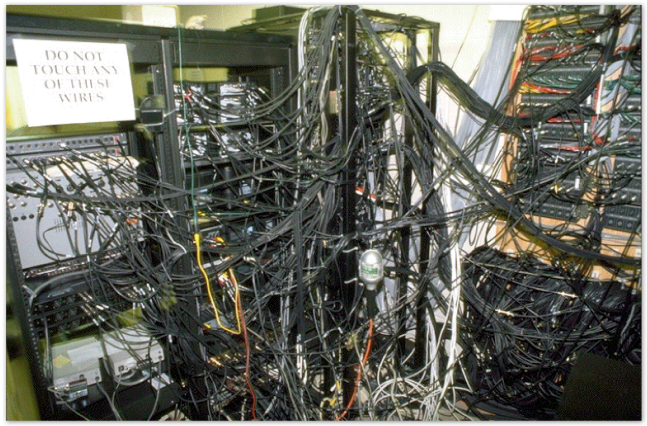
Mediaspace: technical aspects



Mediaspaces: social aspects

- Levels of engagement
  - Background (public view, overview, office share)
  - Short focused call (videophone, videoconference)
  - Interruption (glance)
- Problem: how to control privacy
  - Few visual and auditory cues
  - How do I trust the sytem?
- Solutions
  - No control but symmetry: If I can see you, you can see me
  - Explicit control: allow every call
  - Selective accessibility

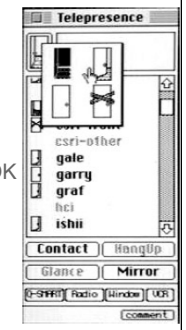
Mediaspaces: selective accessibility

Example (Ontario Telepresence Project)

Door metaphor:
- Open: glance and video call OK
- Ajar: glance OK, video call needs explicit OK
- Closed: no glance, video call needs explicit OK
- Locked: no glance, no video call

One prototype linked it to the physical door

Extensions to have different door states
for different people: too complicated
Leaves newcomers out



Some lessons from mediaspaces

Challenges the telephone model:
- A call interrupts, and has a beginning and an end

Instead:
- Access to a person is negotiated, typically with a glance to see if the person is accessible, and then a videocall
- Communications can be (very) long term: office share for several years at Rank Xerox EuroPARC
- Generalizes to more than two participants

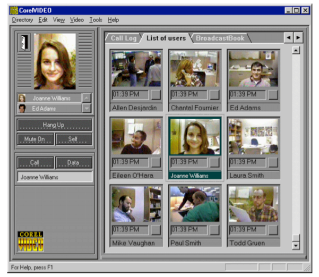
BUT: social aspects are important
- users must be involved in the design and deployment

The failure of mediaspaces

While technology makes this more feasible, there are no mediaspaces in use today

Skype, Google hangouts, iChat miss the mark completely

Why?



Corel Video (1997)

How do people communicate?

Direct, focused communication is covered by many technologies: email, phone, instant messaging, …

Staying in touch, peripheral awareness are not addressed by current technologies

People want to share private messages with small groups of close relatives, friends and co-workers

Social networks do not address this need (although they want you to think they do)

interLiving project

European IST FET project (2001-2003)
- Disappearing Computer initiative

Study communication within distributed families

Participatory and multidisciplinary approach
Over 70 family members in France, US and Sweden
Many observations, workshops, technology prototypes

How to study technology that does not yet exist?

Technology probes (Hutchinson et al., 2003)

Simple “unfinished” prototypes,
with a single function,
designed to understand a need,
not to solve it

Three goals
- Design: inspire both users and designers
- Build: test a specific technology in-situ
- Analyze: collect usage data

VideoProbe (Conversy et al., 2003)

A device designed for sharing
images of everyday life

Automatically takes pictures
according to motion sensing
Automatically shares them with
a similar remote device
Automatically disappears images
after a few days

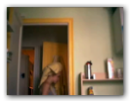
Explicit browsing of images
Explicit action to keep images long term



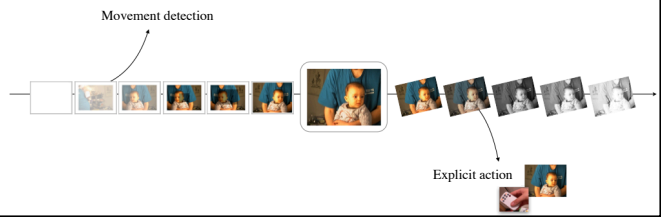
VideoProbe

Co-adaptation: participants use the device in unexpeced ways



System mostly autonomous: Importance of transitions



VideoProbe: lessons learned

Families loved VideoProbe
- Implicit sharing of everyday life
- “day-at-a-glance” by browsing images
- Personal albums
- Becomes part of everyday routine

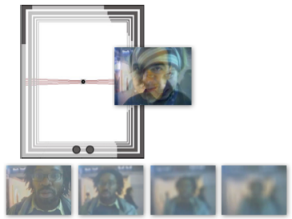
VideoProbe made families closer
- Better awareness of other family members
- Increased the number of phone calls

But VideoProbe was hard to deploy
- Good calibration of the autonomous aspect was hard

MirrorSpace (Roussel et al., 2004)

A video communication system that uses distance
to support peripheral awareness
as well as more intimate communication

A mirror-like frame features
- LCD display
- Micro-camera in the center
- Proximity sensor



2 devices are linked together

Local and remote images are merged

Image more blurry when far away, sharp when up close

MirrorSpace

Several installations in public exhibits

DC Jamboree
(Oct 2002)

Jeune Création
(Feb 2003)

Mains d'Œuvres
(Apr 2003)

Centre Pompidou
(Nov 2003 - Jan 2004)

Image overlay creates intimate communication
- People who do not know each other move away
- People who know each other play with the mixed image

Multiscale communication (Roussel & Gueddana, 2007)

Social protocol to engage in communication
- Approach, Send signals to communicate
- Reciprocate signal, Engage in conversation

Computer systems do not support these social protocols
- Shifting from email to texting to phone call to videocall requires shifting from one system to the next

Multiscale communication supports such transition,
- from peripheral awareness
- to direct, focused communication
- and back
- => multiple levels of detail in the communication

Embodied communication

Robots as remote surrogates
- A face (LCD display), a mouth (loudspeakers)
- eyes (a camera) and ears (a microphone)

Remotely controlled by the participant

Summary

Video communication is very powerful
(and with great power comes great responsibilities)

Most people want to communicate not with the world,
but with their close family and friends, privately

Communication is a process,
from peripheral awareness to direct, focused exchange

Current technology makes the wrong assumptions
- Technological mediation must be as transparent as possible
- Constant shifts between levels of engagement
- Privacy is critical

References

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