‘Social Science as a Service’: Challenges of interdisciplinary research

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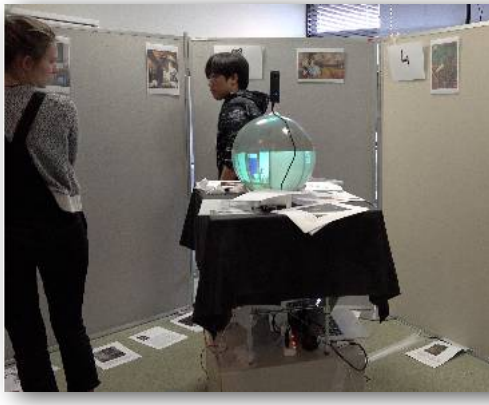
Background: Work, Interaction & Technology

- naturalistic (video based) studies of social interaction - informed by ethnomethodology and conversation analysis
- (quasi-) naturalistic studies with prototypes
- organisations: tacit skills and practices: talk, gesture and material conduct
- settings: surgery, control rooms, trading rooms, news rooms, dentistry, optometry, auctions, education, medical practice, architecture, design, construction, markets, museums and galleries, auctions…

Collaborations: Technologies to support work and interaction

- Mobile Systems
- Augmented devices
- Human-Robot Interaction
- Collaborative technologies
- Exhibits, Craft- and Art- Installations
- Artificial Intelligence



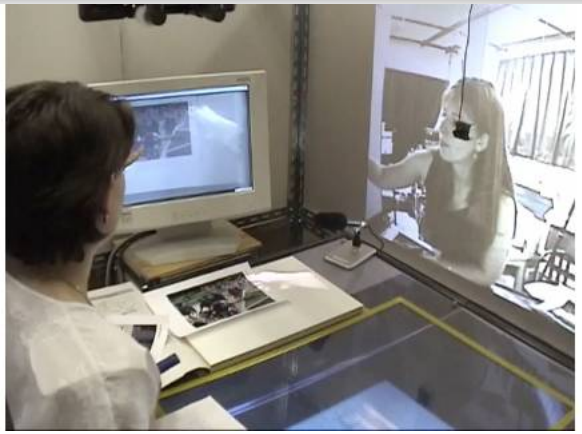



Kinds of Contribution

- requirements
- design implications
- user studies
- funding body requirements: relevance, impact, 'social acceptance', ethics, responsible innovation
- acting as an intermediary - with user, organisation

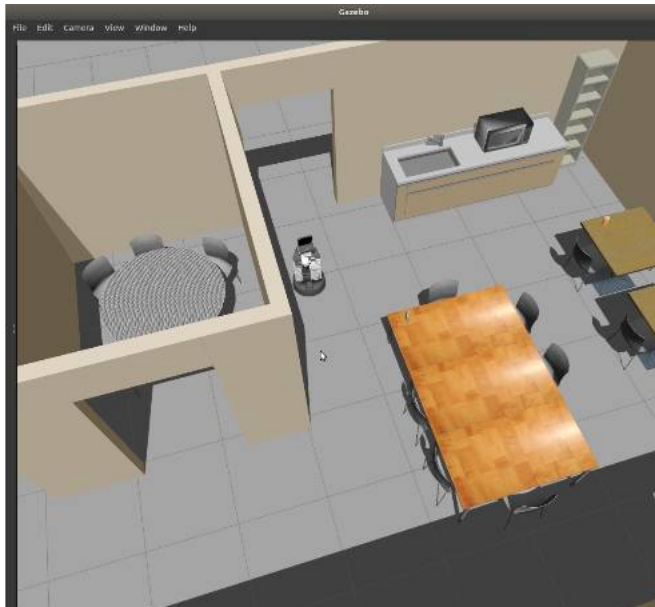
Outline: configuring interdisciplinarity

- Social Science as a Service
- Developing forms of collaboration
- Innovating methods and concepts
- Exemplars
- Problems and barriers



Example problems

- access to users vs access to collaborators
- availability of technology for ‘real world use’
- usability of prototypes - ‘simulations’



‘Social science as a service’

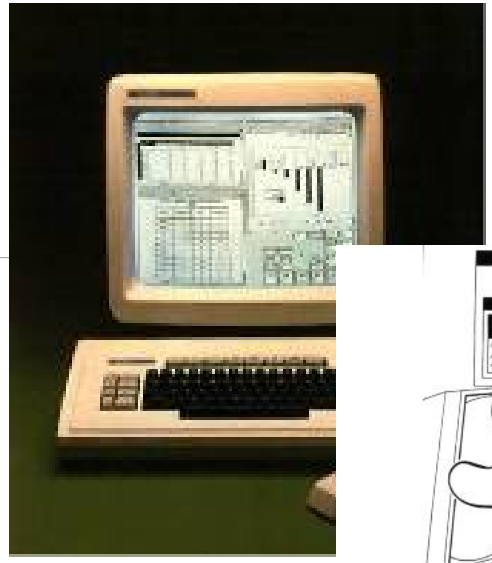
- Requirements analysis - confirmation there is a need for an intended technology, not requirements for alternatives
- Design Implications - suggestions for appearance and interface, not design of interaction or physical characteristics
- Responsible Innovation - outsourcing a social conscience, ‘doing things right’
- note academic demands of social science - nature, timing and forms of publication, analytic orientations, theories and sub disciplines, ‘quick and dirty’ methods

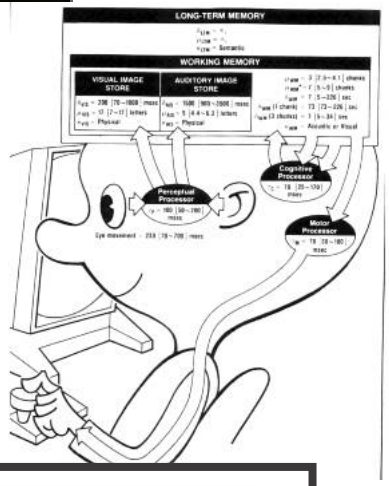
‘Computer Science (or engineering) as a service’

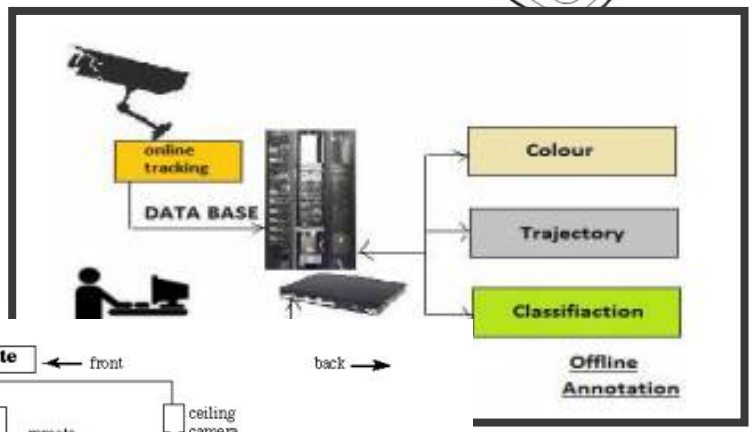
- Access to organisations and site
- Entry into contemporary topics and themes
- Computer scientists as application developers
- Computer science (or engineers) as a topic of research - ironic studies

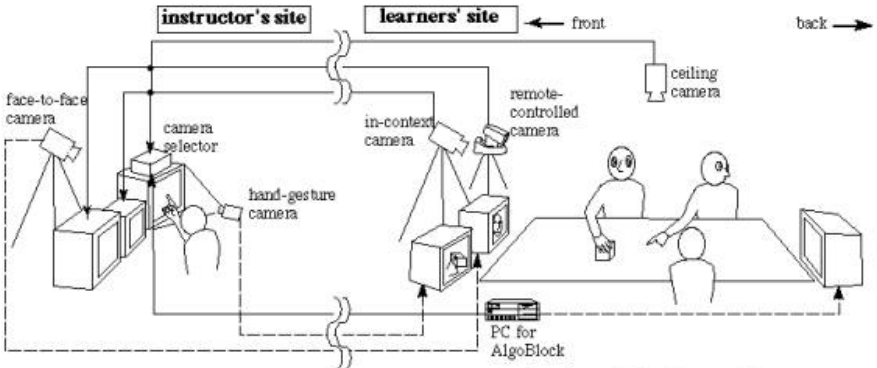
Developing interdisciplinary relationships

- Artificial intelligence - interactions with expert systems (Alvey)
- Automated image recognition systems - organisational requirements (Prismatica)
- Video-mediated interaction - rethinking media spaces (Xerox and Japan)



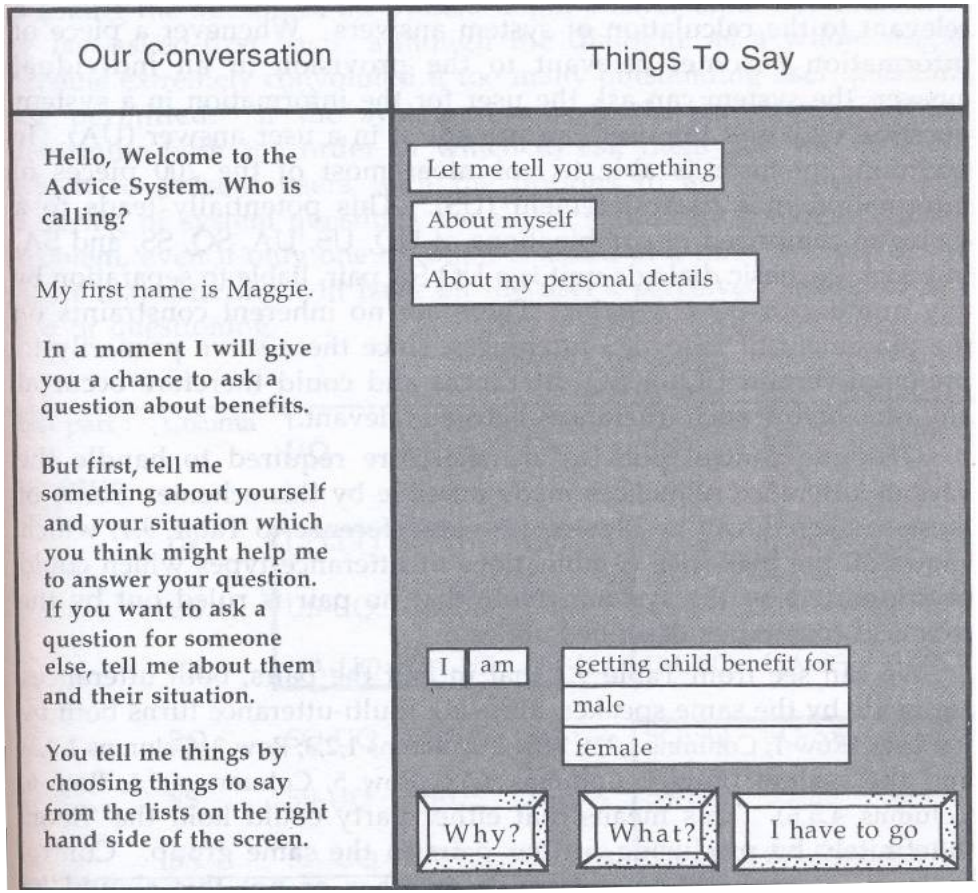






Example 1: The Alvey DHSS Large Demonstrator Project (1983 - 89)

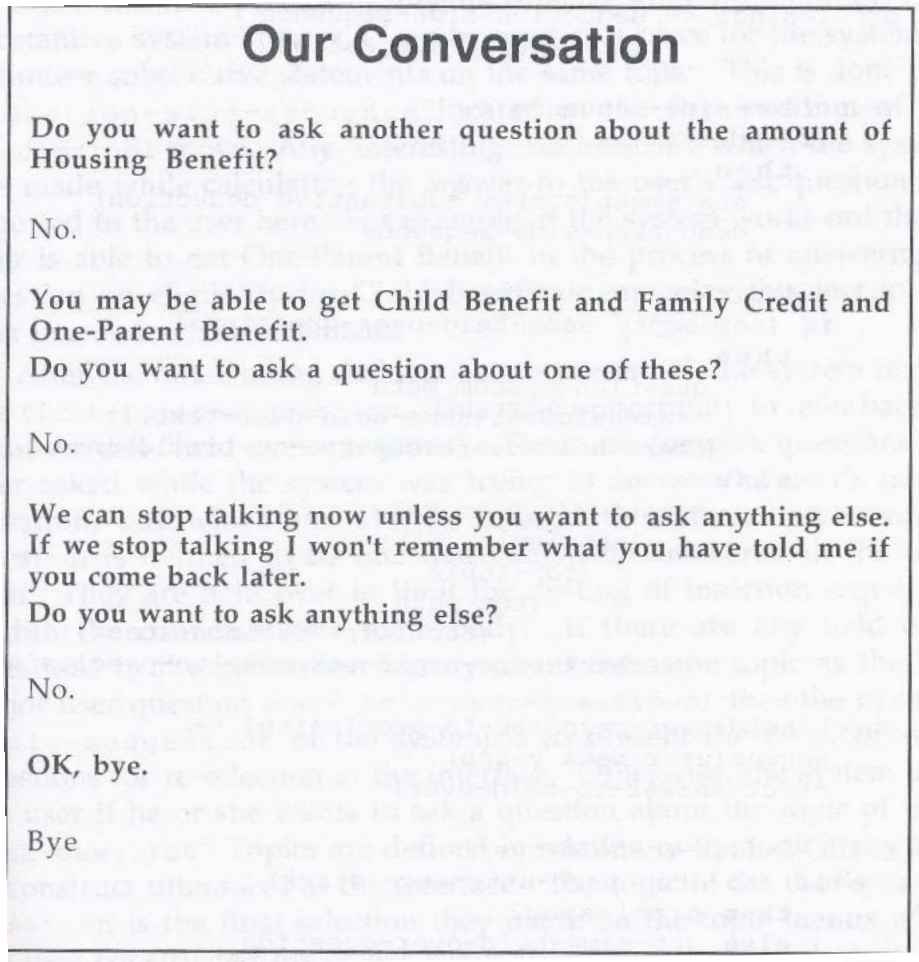
- collaboration between computer scientists, psychologists, social scientists, computer companies and government institutions
- development of demonstrators (prototypes)
- not just for experts - the Forms Helper and the Advice System



Luff, P. K., Gilbert, G. N. and Frohlich, D. M. (eds.) (1990) Computers and Conversation. London and New York: Academic Press.

The Challenge

- how to understand the ‘user’ - ‘potential user studies’ - social poilicy and sociology
- how to design the interaction?
  - mixed initiative interaction
- Draw from social science
  - situated action (Suchman)
  - conversation analysis
  - findings - ‘rules’



Our Conversation

Do you want to ask another question about the amount of Housing Benefit?

No.

You may be able to get Child Benefit and Family Credit and One-Parent Benefit.
Do you want to ask a question about one of these?

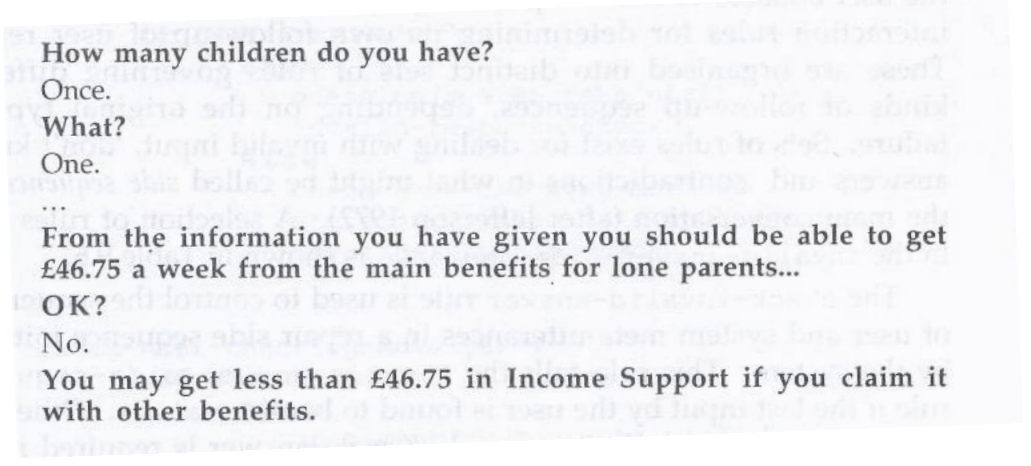
No.

We can stop talking now unless you want to ask anything else. If we stop talking I won't remember what you have told me if you come back later.
Do you want to ask anything else?

No.

OK, bye.

Bye



How many children do you have?
Once.
What?
One.
...
From the information you have given you should be able to get £46.75 a week from the main benefits for lone parents...
OK?
No.
You may get less than £46.75 in Income Support if you claim it with other benefits.

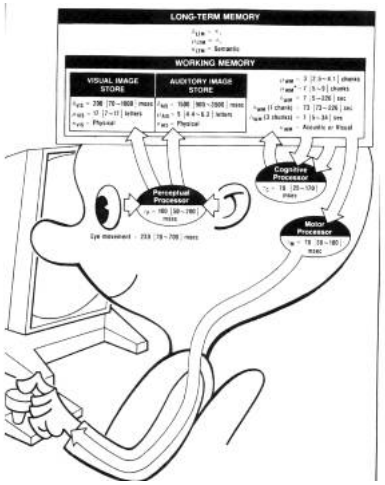
Contributions

- rules for opening, turn-taking, closing, repair
- inter-disciplinary team: academics, industry, domain experts
- ‘successful’ demonstrator
  - narrow conception of ‘findings’
  - constrained collaboration on project - programme of work afterwards

```
conversation <- opening
                body

body <- if (OR (user-questions) (system-questions))
                then adjacency-pair
                else preclosing1

adjacency-pair <-     user-open-floor
                      system-floor
                      body

user-open-floor <- if (system-questions)
                      then user-answer-turn
                      else user-statement-turn

user-answer-turn <-
    answer(user substantive endTurn (possible-answer))
user-answer-turn <-
    answer(user substantive endTCU (possible-answer))
    check-to-continue
user-answer-turn <-
    answer(user substantive check? (possible-answer))
user-answer-turn <- question(user substantive)
user-answer-turn <- question(user meta ri)
user-answer-turn <- question(user meta ntri)

user-statement-turn <- question(user substantive)
user-statement-turn <-
                       statement(user substantive endTurn)
user-statement-turn <-
                       statement(user substantive endTCU)
                       check-to-continue
user-statement-turn <- statement(user substantive check?)
user-statement-turn <- statement(user meta endSession)
                        check-end-of-session

check-to-continue <-
      if (OR contradiction
          (dont-know (top past-utterance-stack))
          (NOT (valid(top past-utterance-stack))))
            then possible-system-interrupt
            else user-statement-turn
```

Luff, P. K., Gilbert, G. N. and Frohlich, D. M. (eds.) (1990) Computers and Conversation. London and New York: Academic Press.

Longer-term consequences

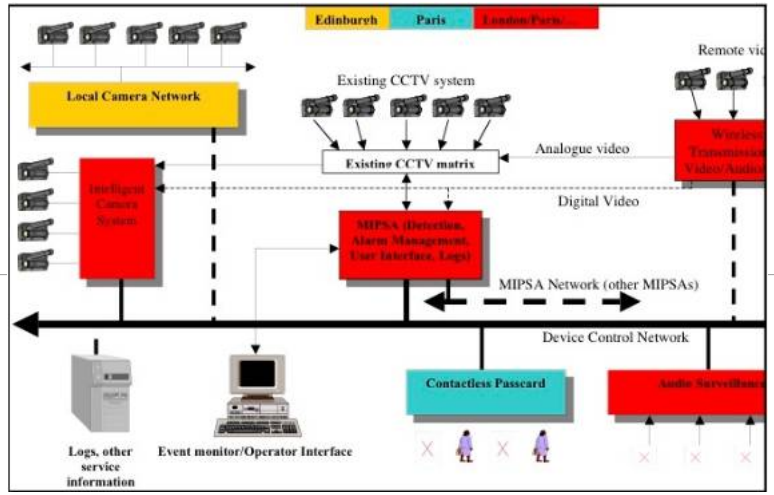


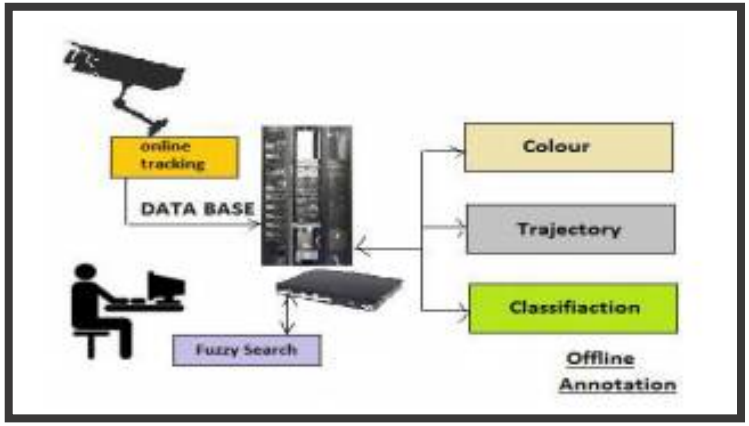
- Shifting nature of contribution - from social science findings to social science methods
- Workplace studies
  - Naturalistic vs experimental methods (ethnography, video-analysis)
  - Cognitive Science to Social Science
  - Interaction to Collaboration
- Sociological theories and concepts

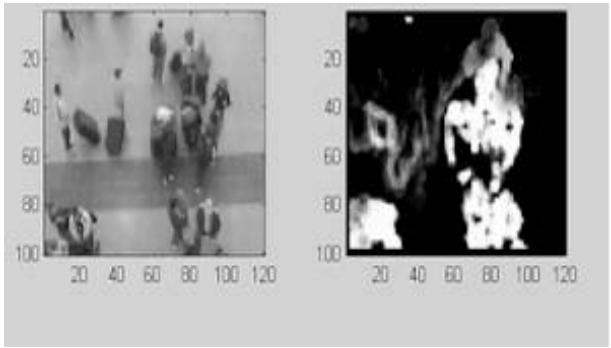
Example 2: surveillance, public behaviour and image recognition technologies

Surveillance & Security

- security management: Prismatica (Proactive Intelligent Systems for Security)
- Partners: London Underground, RATP, STIB, ATM, PTP, ML
- image processing systems and related technologies





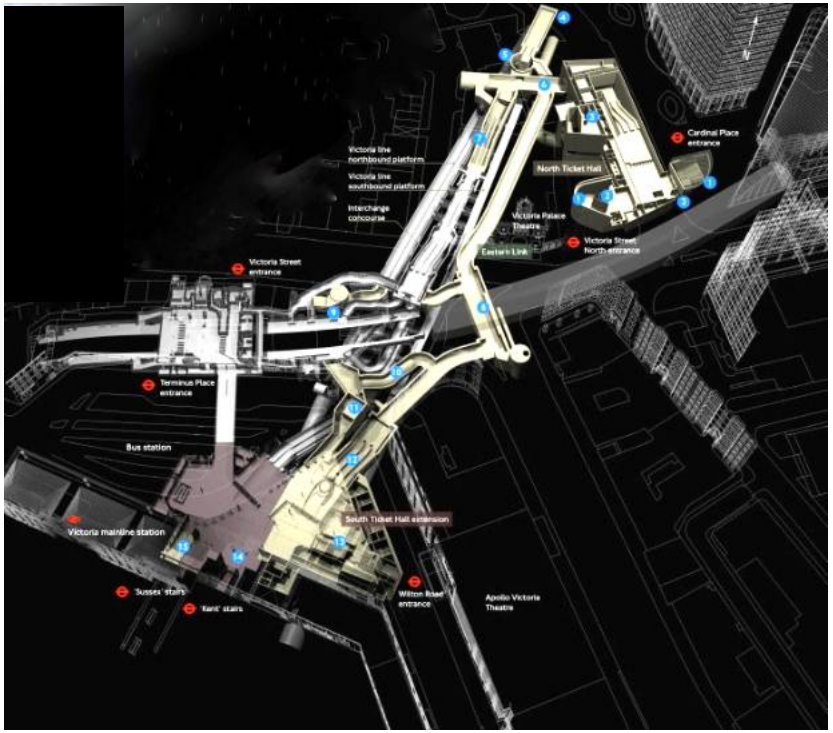


Velastin,S.A. (2004) PRISMATICA: a multi-sensor surveillance system for public transport networks,12th IEE International Conference on Road Transport Information & Control - RTIC 2004

The Problem

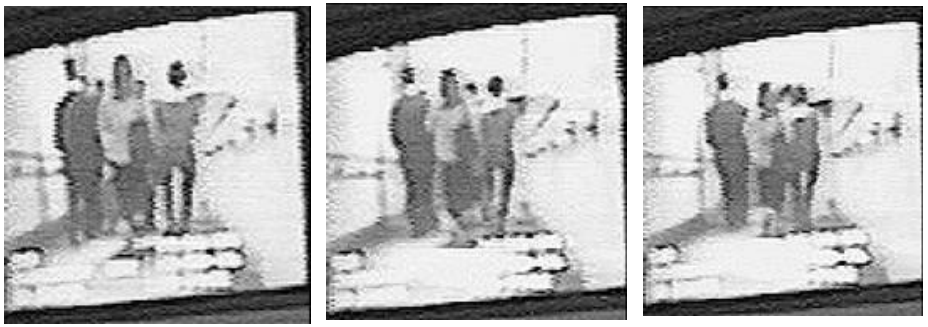
- highly complex domain
- small number of views
- restricted focus

- fragmented images and scenes
- identify problems, incidents and misdemeanours



Detecting Incongruities

- Wafts of smoke in air
- Dressed strangely
- Large Bags
- Cycles, push-chairs and sticks
- Walking close behind another (in foyer)
- Looking down (on escalators
- Glances and movement



- ➡ Smoking
- ➡ ‘incidents’
- ➡ suspect package reports
- ➡ delays/assistance
- ➡ doublers
- ➡ pickpockets

Tailoring organisational solutions

- particular events
- particular places
- particular people

- Temporal Organisation of Events
  - days of the year
  - days of the week
  - times of the day

- Assembling coherence from multiple sources

Surveillance in practice: Monitoring and awareness

- highly selective: motivated ways of seeing

- socially organised practice and discrimination

- Different kind of requirements and design implications

Issues of organisational accountability and deployment

Practical video analysis

- Understanding of monitoring practices - ‘the surveillance society', cognitive overload

- Analysis of Behaviour in Public Places

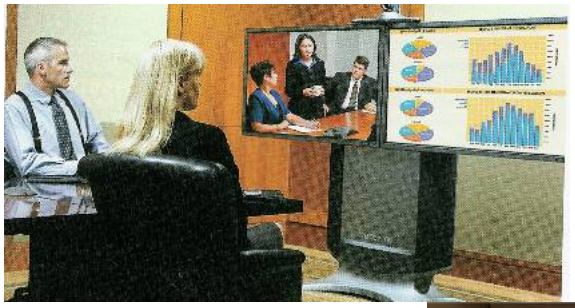
- Sacks’ gloss - understanding participants’ expertise

Example 3: Media Spaces and video communication

- Xerox EuroPARC: an audio-visual & computing infrastructure
- reconfigure the workspace
  - enhance the informal
  - occasion encounters
  - support collaboration

Video-mediated interaction

- performative impact of conduct through video
- ‘disembodied conduct’ - the non reciprocity of perspectives
- fractured ecologies
- recurrent problem: media spaces, video conferencing, collaborative virtual environments, gestural interfaces, human-robot interaction,...

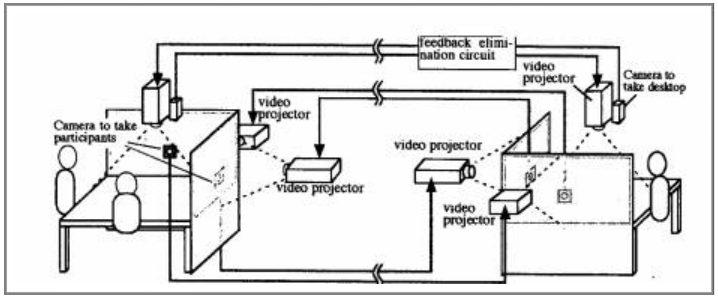


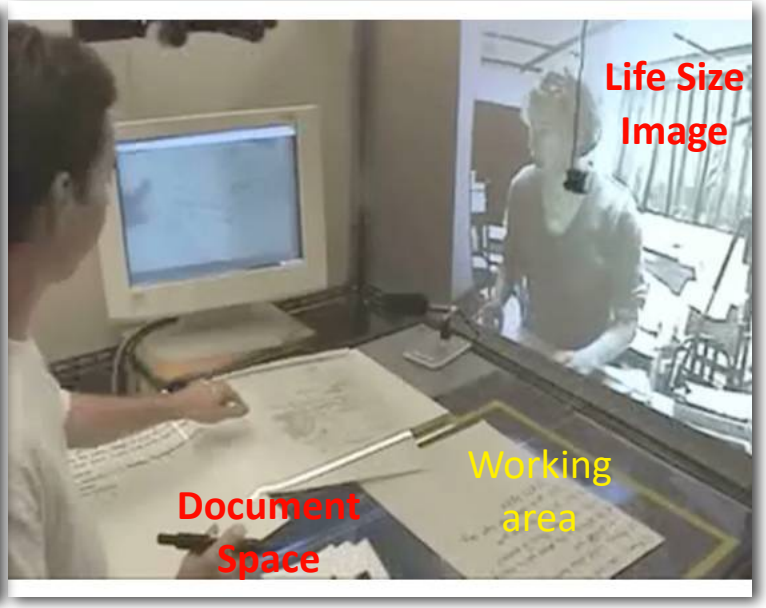
Workplace studies: ‘requirements’ for media spaces

- flexible focus: face to face & resource centred
- contingent participation, alignment & orientation
- seamless shifts between individual & collaborative
- participation in multiple activities
- embodied & embedded action

Working with documents: Agora

- support focussed and unfocussed collaborative activities
- mediate and render visible activities
- support the assessment of the orientation and engagement of the other





Luff, P., Heath, C. Kuzuoka, H., Yamazaki, K. & J. Yamashita. (2006) 'Handling Documents and Discriminating Objects in Hybrid Spaces'. Proceedings of Conference on Human Factors in Computer Systems CHI 2006

Transforming media space

- a programme of research
- workplace studies: two main issues
  - reference & pointing
  - embodied work with and around artefacts
  - action embedded its ecology
- media space interventions & iterations
  - working with objects (documents): VideoDesk, Agora
  - reconfiguring orientation & alignment: tRoom
  - enriching the environment: tRoom Touch, Camblend
  - seamless shifts between individual & collaborative: Kubi
  - working with a constellation of objects, artefacts, and tools: OmniGlobe

Innovative approaches - the quasi-naturalistic experiment

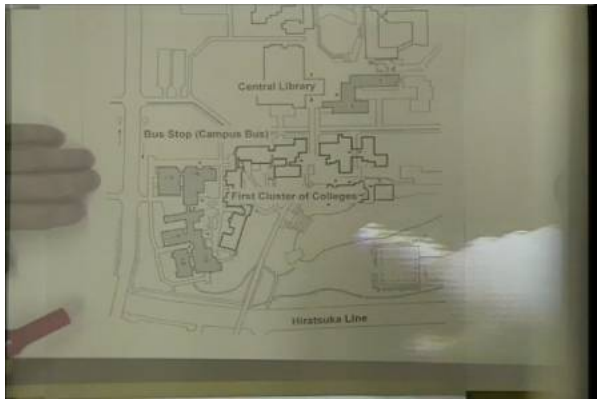
- Contrast to ‘user study’ and post-hoc questionnaires

- Drawing on workplace studies to design task
- Open-ended, flexible activities
- Analysis of accomplishment of in situ interactions - managing problems, accomplishments

Luff, Paul; Heath, Christian; Yamashita, Naomi; Kuzuoka, Hideaki & Marina Jirotka (2016) Embedded Reference: Translocating gestures in video-mediated interaction. 49, 4, 342-361. Research on Language and Social Interaction.

The detailed and the mundane

- the sequential nature of referential conduct (pointing)
- configuration of the space
  - pointing and reference through technology
  - pointing and reference in real-world



The interplay of workplace studies and technology

- substantive - informing requirements, design, assessment and deployment
  - research programmes vs research projects
- methodological - the quasi-naturalistic experiment: exploring technological innovations and social interaction
  - informing technological development and informing social science
- analytic - public behaviour, materiality, trust
  - disrupting the everyday - making the ordinary strange

Getting Interdisciplinary Collaboration to Work

- Recognising the contributions of others
  - ‘What can they realistically do?’
- Recognising the demands others face
  - ‘What’s in it for them?’
- Developing a programme of work
  - ‘What could be the next project?’