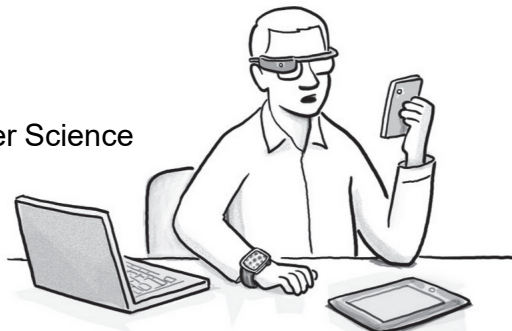


COMS W4170

Collaboration

Steven Feiner
Department of Computer Science
Columbia University
New York, NY 10027

(with thanks to
Lena Mamykina)



November 13, 2018

"Hold on, I'm going to conference in my wrist."

THE NEW YORKER

1

CSCW

Computer-Supported Cooperative Work

- People working/playing/interacting together through or with the use of computers
 - HCI Human-Computer
 - CSCW Human-Computer-Human
- Groupware
 - Software / platforms to support group interaction

4

CSCW



What's in a Name?

- “Twenty-five years after its founding, the CSCW community concluded that... [i]ts name no longer reflects the group’s activity. Each word in “Computer Supported Cooperative Work” has lost its relevance.

C: *Computers* are no longer the only digital devices of interest.

S: Digital technology is no longer confined to a *support* role; it is integral to many activities.

C: The focus was initially on small groups for which *cooperation* was the norm, but today’s digital world features hacker attacks, spam, privacy concerns, conflict, and competition.

W: In 1985 systems capable of supporting groups were mainly affordable in corporate *work* settings. It’s different now.”

— J. Grudin, “CSCW: Time Passed, Tempest, and Time Past”, *Interactions*, July+August 2010, 38-40

5

Collaboration: Human Interrelationships

- Focused partnership
- Lecture/demo
- Conference
- Ecommerce
- Online community/game
- Collaboratory
- Telepresence
- ...

A computer-supported environment (typically virtual) for interaction among scientists to work together: share data and instruments, perform experiments...

6

Collaboration: Issues

- *Who* are the participants?
- *What* can participants do?
- *When* do participants interact?
- *Where* do participants interact?
- *How* do participants interact?
- *How* are participants represented?

7

Collaboration: Issues (cont.)

▪ **How** do participants interact?

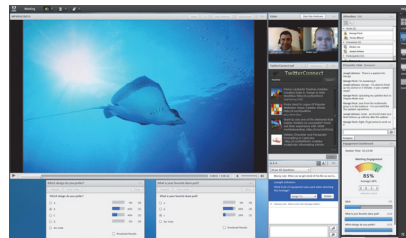
▪ Computer-mediated communication

- Text
- Voice
- Video
- ...

- Movement in 3D space
- Coordination
- Awareness
- Privacy

Support for

- “Hand raising” and “calling on” participants in order
- Breakout rooms



<http://www.adobe.com/products/adobeconnect.html>

8

Collaboration: Issues (cont.)

- Pros and cons of different interaction modalities
 - Text
 - Voice
 - Video
 - ...

9

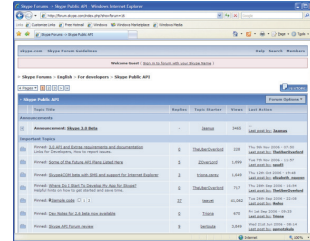
When and Where: Collaboration Time–Space Matrix

	Same Time (synchronous)	Different Times (asynchronous)
Same Space (co-located)	<i>Face-to-face</i> Class, meeting, shared display,...	Office projects, shared physical repository
Different Spaces (distributed)	Shared editing, chat, conferencing,...	Email, discussion groups, wikis, social networking sites,...

11

Different times, different spaces

- Email, discussion groups, blogs, social networking
 - “Ping-pong” interaction
 - Inline incorporation of earlier turns
 - Limits on interaction → flaming, emoticons ☺
- Collective knowledge bases, jointly authored documents
 - Wikis



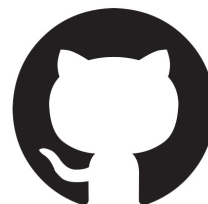
12

Different times, different spaces

- “Synced” file sharing and re-use
 - Dropbox
 - Source code control systems
 - Subversion
- ↓
- Repositories/Social Coding
 - GitHub



<http://dropbox.com>



<http://github.com>

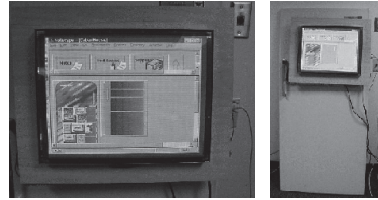
13

Different times, same space

- Shared physical artifacts support communication across time

- Example:

- J. Mankoff et al., CyberFridge, *Proc. CVE*, 1998
 - Notes
 - Refrigerator contents (using barcode reader)



- Samsung Family Hub Refrigerator 2018

- 21.5" touchscreen
- Notes, calendar, photos, TV, weather,...
- Refrigerator contents (using cameras)



<http://www.samsung.com/us/explore/family-hub-refrigerator/>

22

Same time, different spaces

- Shared Apps
 - Google Docs, Sheets, Slides in Google Drive
 - Text, spreadsheet, presentation editors
 - Run in web browser
 - AJAX
 - Simultaneously editable by multiple users



<http://drive.google.com>



27

Same time, different spaces

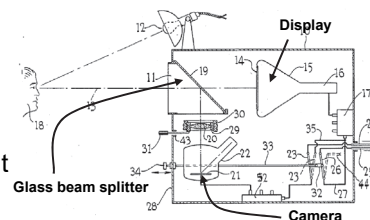
- Videoconferencing
 - “Just like being there”
 - Or is it?



33

Same time, different spaces

- Videoconferencing
 - What's missing?
 - Direct eye contact
 - A.H. Rosenthal, US Patent 2,420,198, 1947
 - Buxton calls this the “reciprocal video tunnel”
 - Peripheral vision
 - K. Yamaashi et al., Extra eyes, *Proc. CHI '96*
 - Detailed and global views are linked
 - Sensors detect interesting events, outlined in global view



<http://www.youtube.com/watch?v=XUOe6uoN48A>

34