Current Topics in Media Computing and HCI

S11 HCI Design Patterns Studio

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http://hci.rwth-aachen.de/cthci

RWTH AACHEN UNIVERSITY

Name, Ranking

Sensitizer

Figure 17: Passing on a mouse for a group display.

Context

…you have picked your hardware to control the room and its services—ROOM CONTROLLER (15), and now need to decide how the technology is operated by the users.

♦♦♦

Problem

Interactive technology likes to be told when something happens or when it is supposed to do something. But people easily forget that extra step, especially when in the middle of a high-energy brainstorming session.

A research video by MIT once showed a group of researchers having a meeting around the table, and the room was "listening in" on the conversation going on. Whenever a certain point was reached, such as deciding to add a new item to the agenda, or delegating a task to a member in the room, everybody had to shut up, and the moderator would speak the corresponding commands for the computer to keep up with what was going on. It was the worst group support interface imaginable.

Good group support software follows what's going on in the room as good as it can, trying to detect from a variety of sensors, models, and other input what the current activity and actors are, and then takes initiative on a simple, reliable level to help the actors, without presuming to understand more than it can.

Computer scientists will argue that deriving this information from sensor values is not reliable, so the computer needs clear commands in order not to do something wrong. This is perfectly true in distributed settings with low bandwidth for human communication: If user A decides to pass control over the shared mouse cursor to remote user B in a shared application, he usually has to click a button to do so.

Examples

In a collocated setting of an AE, an enormous advantage comes to the help of the system: social protocol. The people in the room can see and hear each other. If one person is controlling the mouse cursor using their laptop, and someone else wants to take over with their own laptop, they will just say so. The computer does not need to understand this verbal command, nor does he need to lock the cursor for everybody else but one user at a time: It can simply accept cursor movement from everybody in the room; if there's a conflict of concurrent access, the users will quickly and easily notice and resolve it among themselves. This approach, on the other hand, saves the users having to send explicit messages each time they wish to pass control of that cursor to someone else, making the interaction much more fluid.

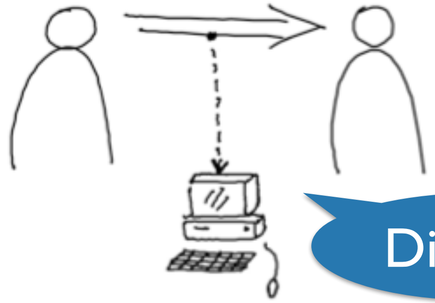
Examples include the design of the interaction for the iRoom's remote cursor control that allows "mouse fights" to occur, simply always using the last coordinate received; or its iClipboard feature that lets people cut and paste in a single shared clipboard for the room.

Winograd et al., in their chapter elsewhere in this book, reflect on this concept by suggesting room infrastructure in which "...users and social conventions in an environment take responsibility for actions, and the system infrastructure is responsible for providing a fluid means to execute those actions."

Therefore:

Solution

Do not put unnecessary protocols into place that are aimed at avoiding overlapping access to technology, if that collision can be easily noticed and fixed by the users through social interaction. If a user issues a social protocol act, such as passing a wireless mouse to someone else, [illegible] an additional repetitive step from the user to tell the room what he just did for everyone else to clearly see.



Diagram

♦♦♦

This is a basic pattern with no further references within this language.

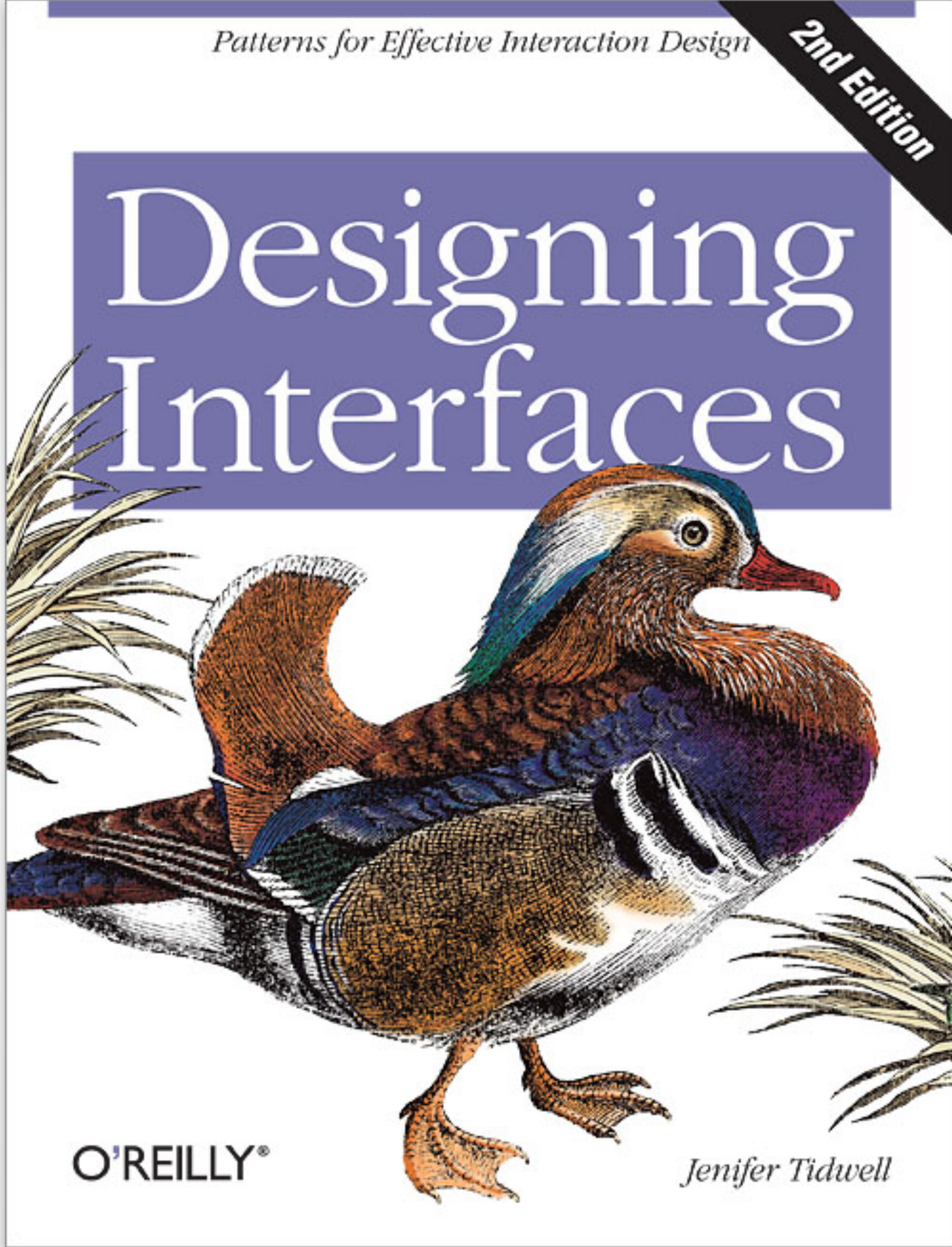
References

Jenifer Tidwell

Designing Interfaces
Patterns for Effective Interaction Design 2nd ed., 2010

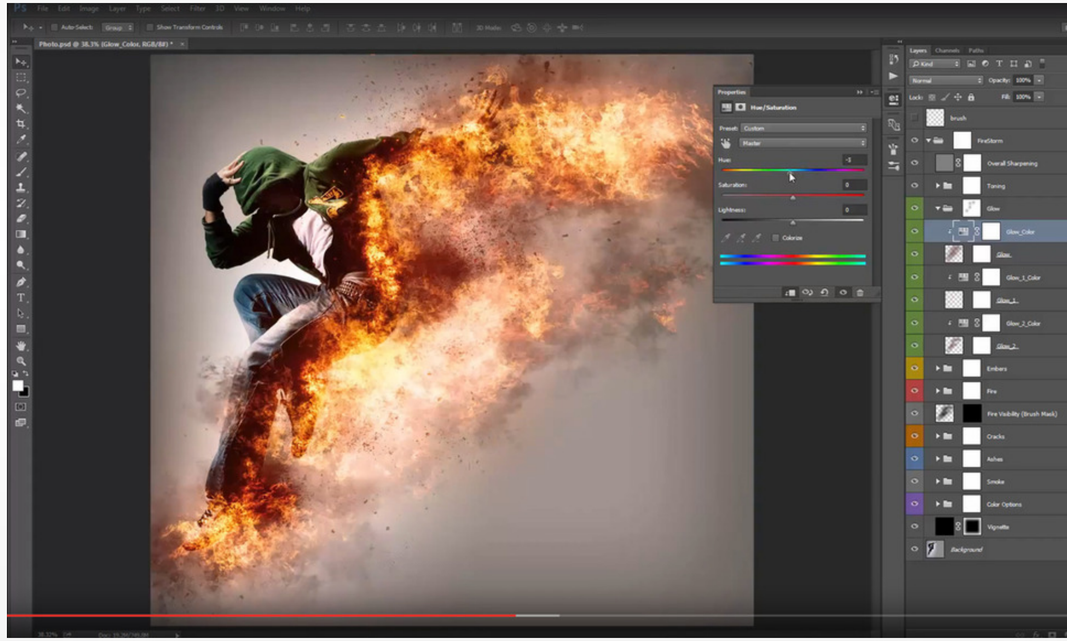
Developed from “Common Ground” Pattern Language (1997)
http://www.mit.edu/~jtidwell/common_ground.html

In part available at designinginterfaces.com



Movable Panels

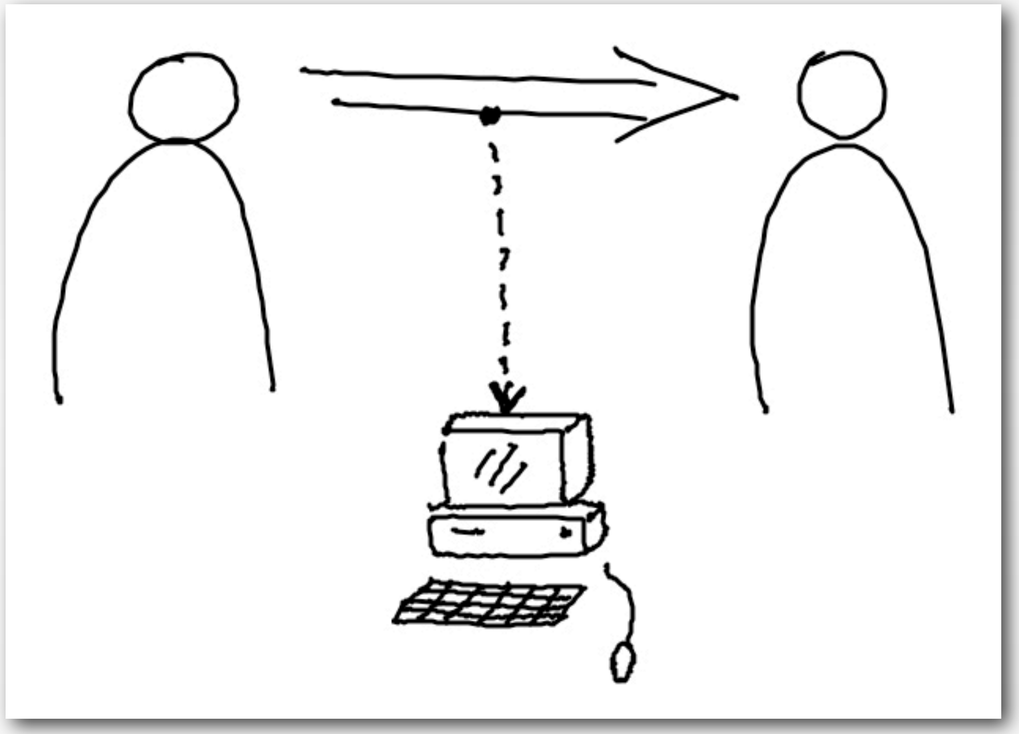
- What: tools/sections of content in separate movable panels
- Use when: UI "pieces" don’t need to be laid out in a single configuration, provide sense of ownership and playfulness
- Why: more efficient and comfortable
- How: “handle” on each panel to afford grab and move, save the layout for the next time, enable "Revert to Default Layout"



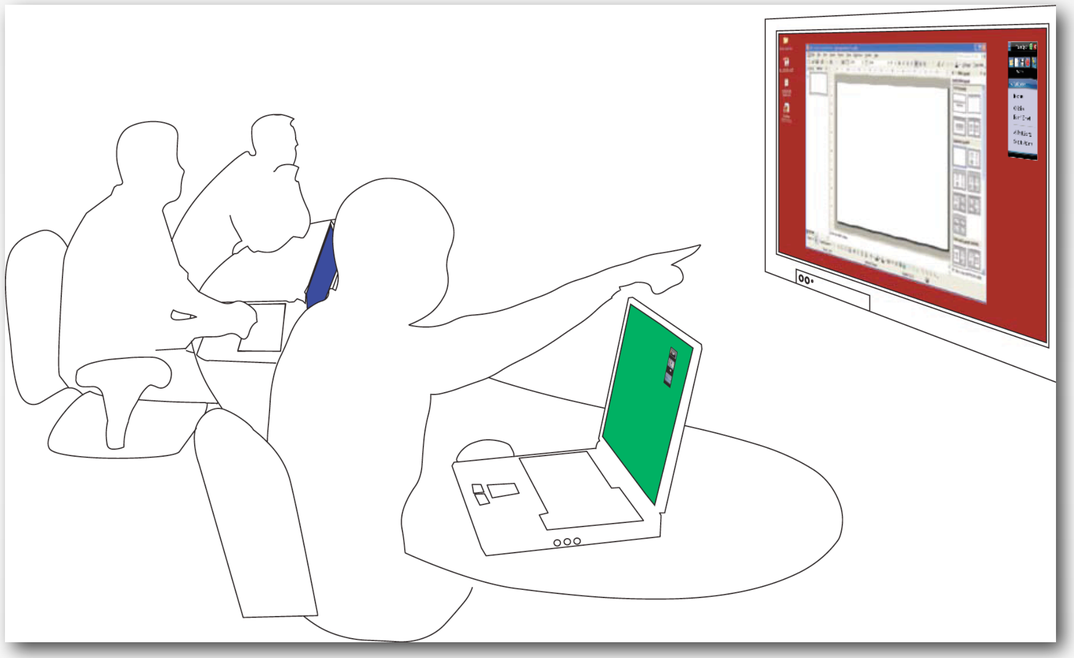
S. Lahlou (ed.), *Designing User Friendly Augmented Work Environments: From Meeting Rooms to Digital Collaborative Spaces*, Computer Supported Cooperative Work, Springer-Verlag, London, 2009

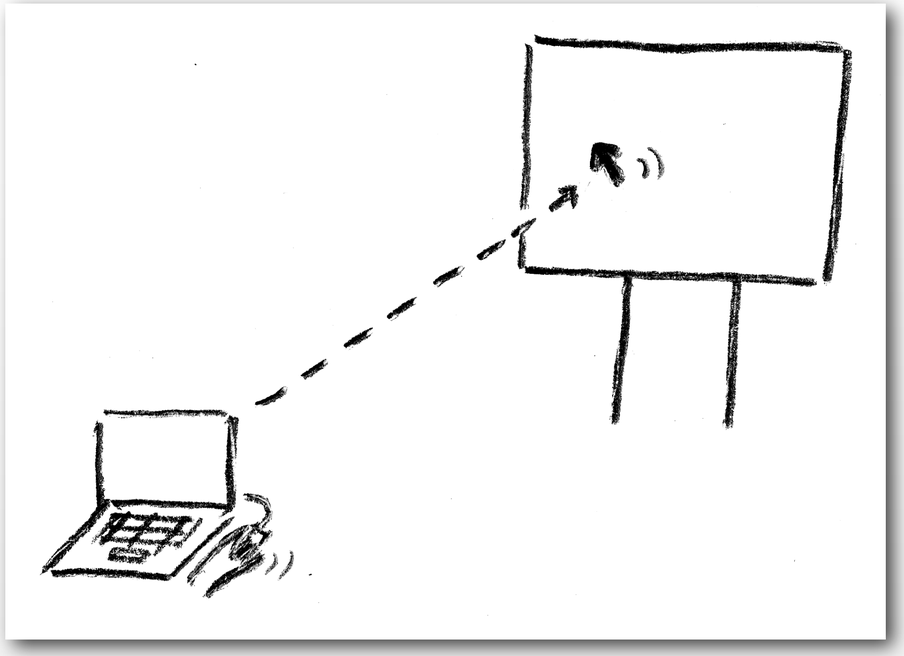
Chapter 10: Jan Borchers,
The Aachen Media Space: Design Patterns for Augmented Work Environments

Social Protocol ***



COLLOCATED GROUP SERVICES **





7 MEDIA BOARDS *

Fig. 8: A media board in the Aachen Media Space.

…you have determined the basic furniture to be put into your AE, and decided to make it as flexible as possible—FLEXIBLE FURNITURE (4). You are now thinking about the right display technology to go with this design.

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Any computer-supported group activity greatly benefits from large, shared display surfaces that can also be sketched upon and interacted with. However, projectors and projection screens are noisy and hard to move around quickly.

Groups need group displays. We have all huddled over a laptop with others, or squinted at it from across the table at some point to see what someone is trying to show us, and it's not a very productive spatial arrangement.

The most frequent solution to this problem are projectors. They are cheap, can project large images (if they have strong lamps and short-throw lenses), are easy to carry around, and can project on a white wall if necessary. However, projectors have a few drawbacks: First, they invariably include a fan that will create background noise in the room unless shielded from the users. Second, even though

From "The Aachen Media Space: Design Patterns for Augmented Work Environments" ~ Jan Borchers

9 INTERACTIVE TABLE **

Fig. 10: The multitouch table, designed by David Holman from the author's Media Computing Group, in use at a research exhibition.

…you have decided on your vertical display space—MEDIA BOARDS (7), but are considering the need for horizontal display surfaces as well.

♦♦♦

Some activities, such as collaborative photo sorting and analysis, are best done by a group around a table. However, traditional laptop or wall displays do not lend themselves well to this situation

Streitz et al. created a touch-sensitive table as part of their *Roomware®* research and product development. [Streitz et al. 1999]. The Stanford iRoom included a table, but it was immobile, with its rear-projection built into the raised floor. The KTH iLounge also featured a fixed table in the middle of the room.

More recently, the author's Media Computing Group has built multitouch-sensitive tables that use rear projection and afford more natural interactions with multiple fingers and hands. This technology has been used, for example, in a multitouch table exhibit for a Dutch children's museum. Microsoft's *Surface* project builds on these ideas to create a commercially viable multitouch table.

The big caveat with tables is their inherent orientation. Reading text together is much harder around a table than on a shared wall display. The direct interaction with artifacts that would also be shuffled around on a real table, however (such as photos), is a big plus, especially if the table is multitouch-enabled (single-touch inhibits the natural parallelism and overlap of collaborative human activity). Toolkits such as DiamondSpin [Shen, Vernier, Forlines and Ringel 2004] allow for easier development of rotation-enabled interfaces.

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First book that brought design patterns to HCI

hcipatterns.org

A PATTERN APPROACH TO INTERACTION DESIGN

Jan Borchers

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Dynamic Descriptors **

Users need help on the virtual objects that they are interacting with. However, conveying all this information all the time would overcrowd the information space.

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Dynamic Descriptors **

Therefore:

Provide one sentence of information on any user interface objects that are not self-explanatory. Activate this information automatically, dynamically, and close to such an object whenever the user has focused attention on it.

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