Using Simple Mobile Devices to Inform and Guide Pedestrians Indoors

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Project Context

- Part of the Collaborative Research Center „Resource Adaptive Cognitive Processes“
- Goal: Generate way descriptions for pedestrians in various situations
- Research focus: looking at computational and cognitive limitations

Situated Information

- Keeps people informed in the proper context
  - respect cognitive and computational limitations
- Reduces the information load to a minimum
- Speeds up cognitive processing of information

Examples:

- Guiding tourist through a town (outdoor)
- Assist a visitor of an exhibition (indoor)

Technical Configurations for AR

- Outdoor
  - Tracking: GPS, compass,..
  - Displays: HMD, Handheld, Panels
  - Communication: Wavelan, radio
- Indoor
  - Tracking:compass, IR
  - Displays: HMD, Handheld, Panels
  - Communication: Wavelan, IR

Gegenwärtiger Technologiestand

- Datenübertragung: Statisch,Funk,Infrarot
- Ortsbestimmung: Funk,Infrarot
- Richtungsbestimmung: Kompass,Infrarot
- Informationspräsentation: Handhelds, Mobiltelefone

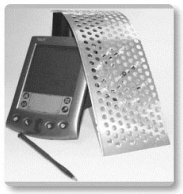
Indoor AR for everybody (who wants to)

- Keep receiving devices simple
- In turn, make the environment smart

⇨

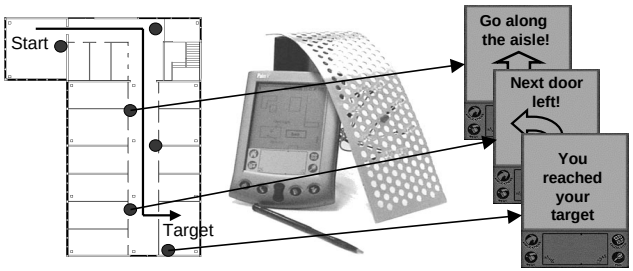
- Use Off-the-shelf devices
- Install Infrared-senders at critical places
- Use IR for “tracking” and data transmission
- Restriction to unidirectional communication

Eyeled-Technologie



- Starke Infrarotsender übertragen Information auf handelsübliche Organizer
- Eine spezielle Software (BrowsIR) präsentiert die Information in Form interaktiver Graphiken und Texte

Example



Broadcast Presentation Graphs

- Principle of teletext
- Handhelds offer more interaction possibilities than TV does
- Transmit presentation graphs rather than single pages node by node.
- Different broadcast probabilities allow for smooth and fast interaction with the presentation

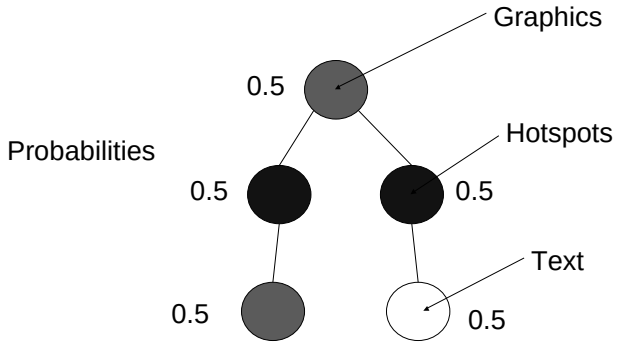
One Way Interaction

Presentation Graphs (1)

Cut presentation into chunks that allow for incremental refinement of the presentation

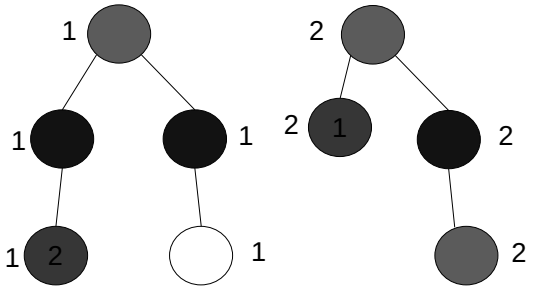
- Graphics
- Text
- Hotspots

Presentation Graphs (2)

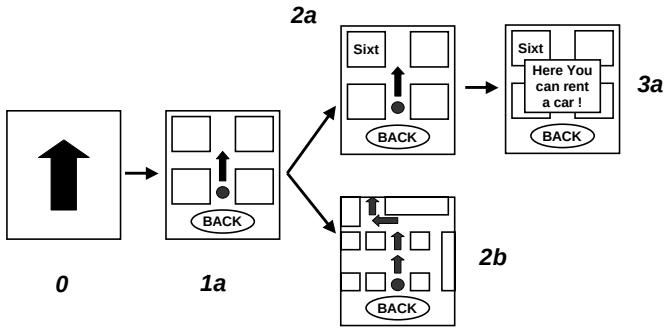


Context (2)

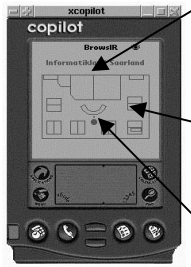
- Introduce Concept of user groups



Designing Presentations



Basic UI Design

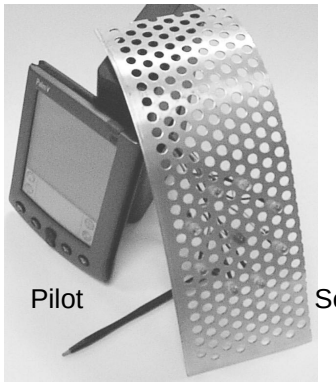


Background graphics are mid gray

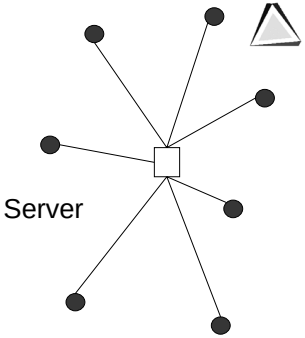
Inactive Links are light grey

Click on black parts of Text/ Graphics

The Irreal-System



Pilot

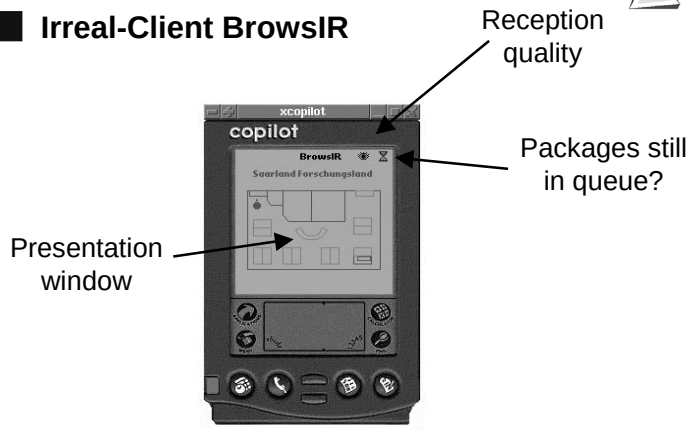


Sender

IRREAL-Server

- Runs on a Linux PC
- Each Sender is fed by its own process
- Dynamic modification of content over the internet
- Supports several types of hardware

Irreal-Client BrowsIR



IRREAL at CeBIT 2000

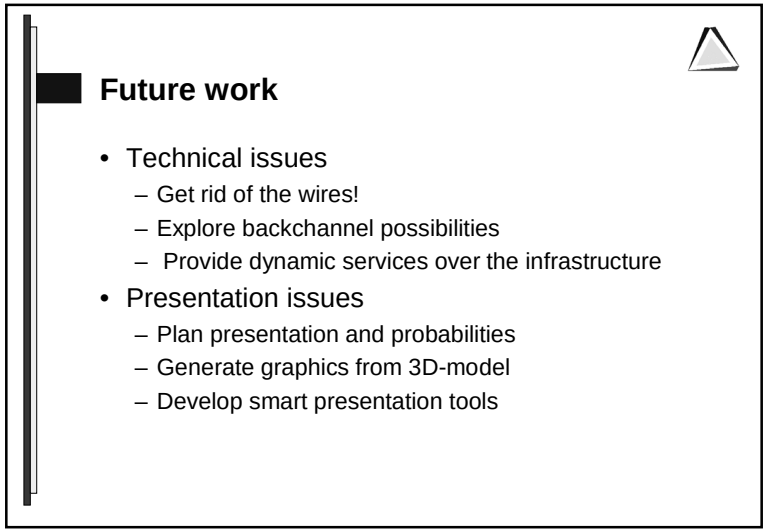
- Show location (with floor plan)
- Help identification of exhibits
- Provide Information on exhibits

The demo will show those tasks for two senders

IRREAL at CeBIT 2000 (2)

Allgemeine Einsatzmöglichkeiten

- Multimediale Dienste in Museen
- Unterstützung von Krankenhauspersonal
- Notfallleitsysteme für Einsatzkräfte
- Informationssysteme für den Handel
- Infopunkte in Flughäfen, Bahnhöfen, Kinos, Restaurants etc....


Future work
• Technical issues
– Get rid of the wires!
– Explore backchannel possibilities
– Provide dynamic services over the infrastructure
• Presentation issues
– Plan presentation and probabilities
– Generate graphics from 3D-model
– Develop smart presentation tools