

LFE Medieninformatik • Sebastian Löhmann

# Applications for Interactive Public Displays

Medieninformatik Hauptseminar  
Sommersemester 2009  
„Interactive Surfaces“



- Number of public displays is rising
- Example: Displays in subway stations
- News, Weather, Cartoons





## interactive

„allowing a two-way flow of information  
between a computer or other electronic device and a user,  
responding to the user’s input “

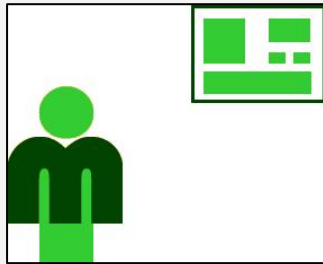
→ *Goal: show, how to make public displays interactive* ←

## VIEW

Displaying information

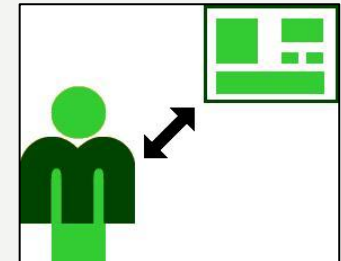
## DOWNLOAD

Save contents on mobile devices



## INFLUENCE

Decide, what contents are displayed

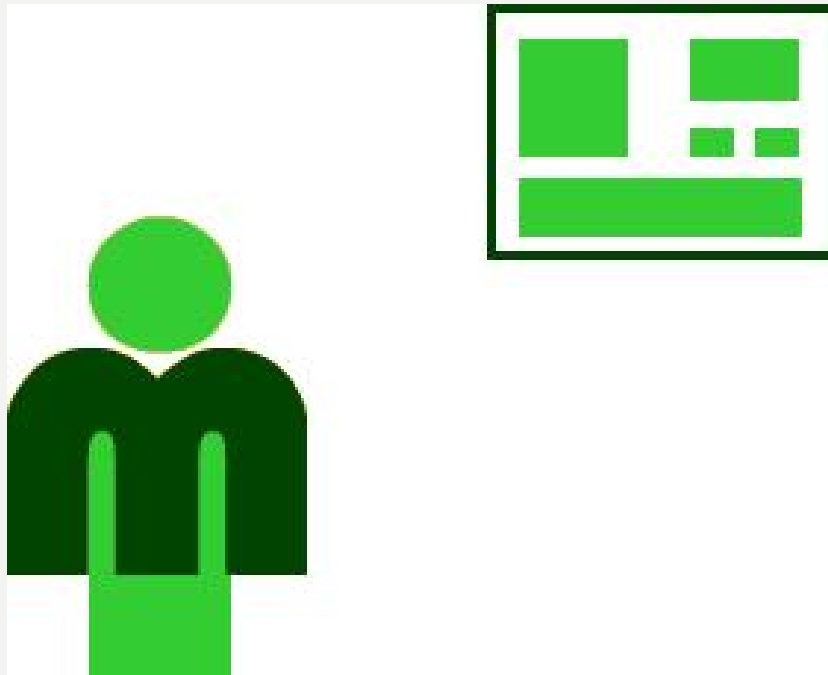


## ADD

Upload contents to the display

## CHANGE

Edit displayed contents



# VIEW

Displaying information

## Displays in subway stations

- Viewer is passive
- Concept known from watching television
- Contents are not very attractive
- Viewers tend to forget the contents

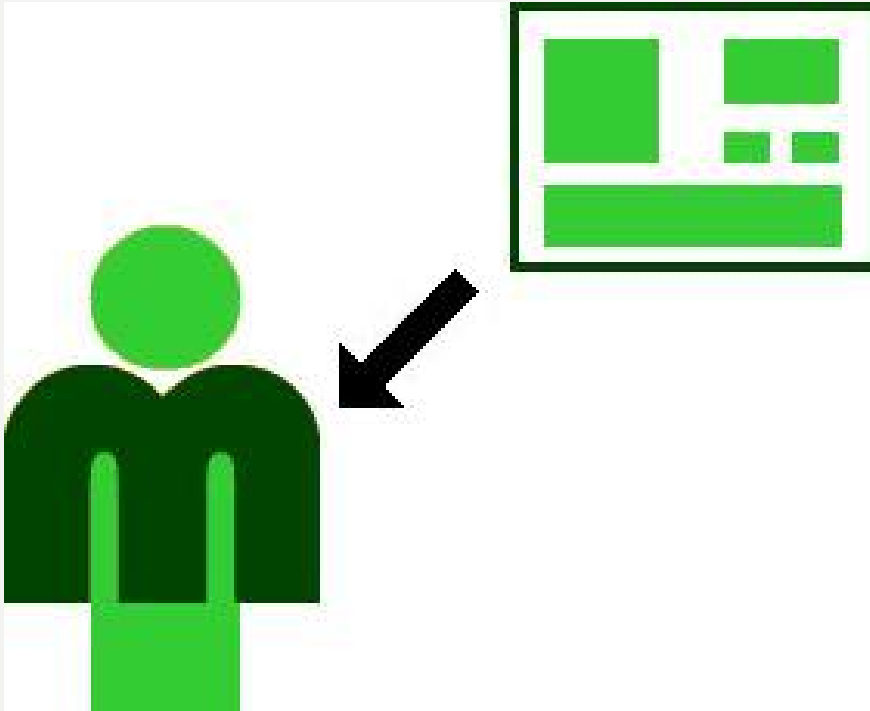


## GROUPCAST

McCarthy 2002, Intel Research



- Common interests of people present are shown
- Goal: initiate conversations
- Problem: users did not fill out big profile forms
- Problem: privacy



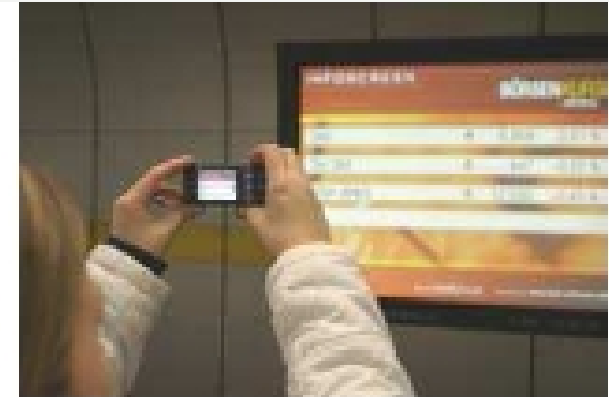
# DOWNLOAD

Save contents on  
mobile devices

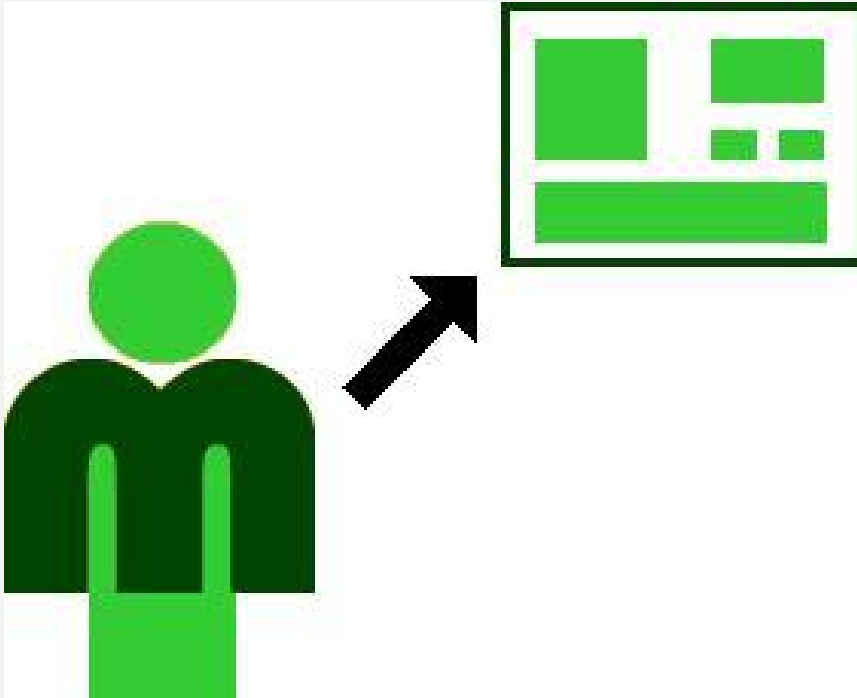


## Shoot & Copy

Boring et al. 2007,  
LFE Medieninformatik



- Obtain contents with the mobile phone's camera
- Connection phone/server via Bluetooth
- Easy to use, mobile phones familiar to most users
- Privacy was not a problem



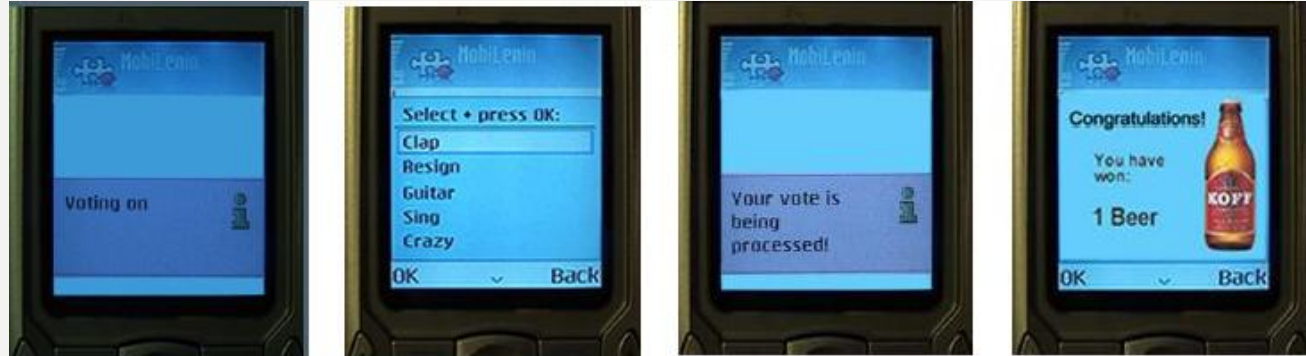
# INFLUENCE

Decide about  
shown contents

# MobiLenin

Scheible, Ojala 2005

University of Art & Design,  
Helsinki



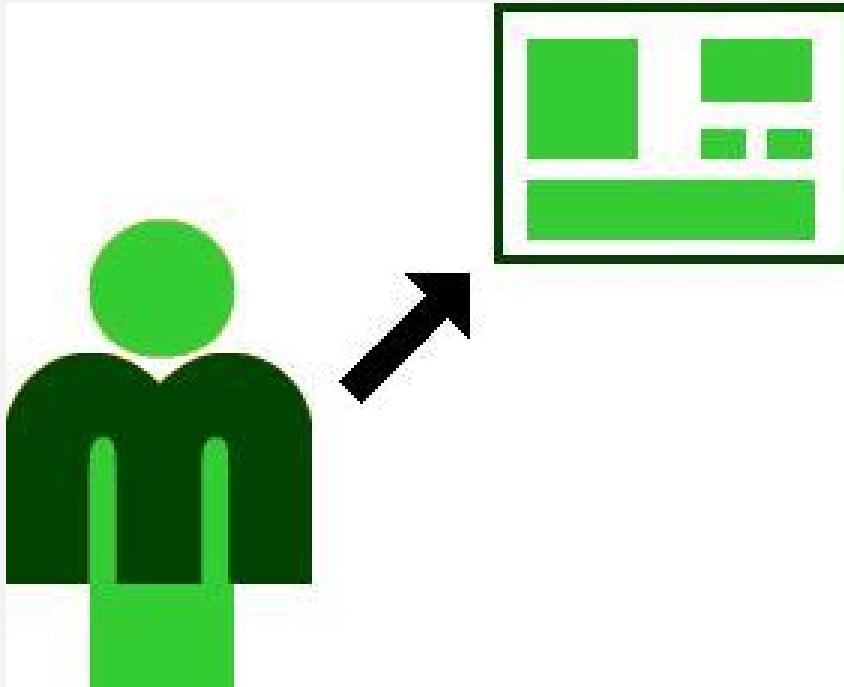
- Teasers of music videos are shown
- Audience can vote for favorite one
- Track with most votes is played
- Easy to use, users had fun with the application

# Polar Defence

Finke et al. 2008  
University of British Columbia

- Game is played with SMS
- Players position towers
- Points for shot enemies
- Second big display supposed to attract interest
- 4-day-user-study: game easy to use, interesting
- Problem: some players were not willing to pay for SMS





# ADD

Upload contents

## A Video Commenting System

Du et al. 2009

Pennsylvania State University

- Works with web interface
- 4 seconds for every comment
- 3115 comments entered by 129 students
- 85% showed high interest for application
- Problem: 19% of comments considered to be spam

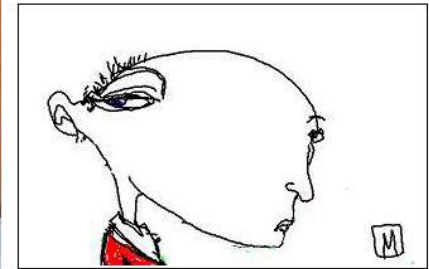
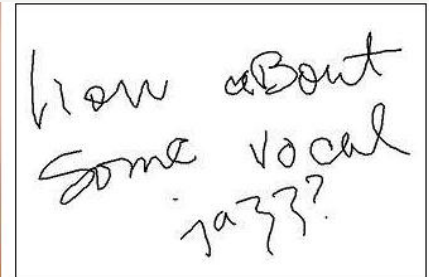


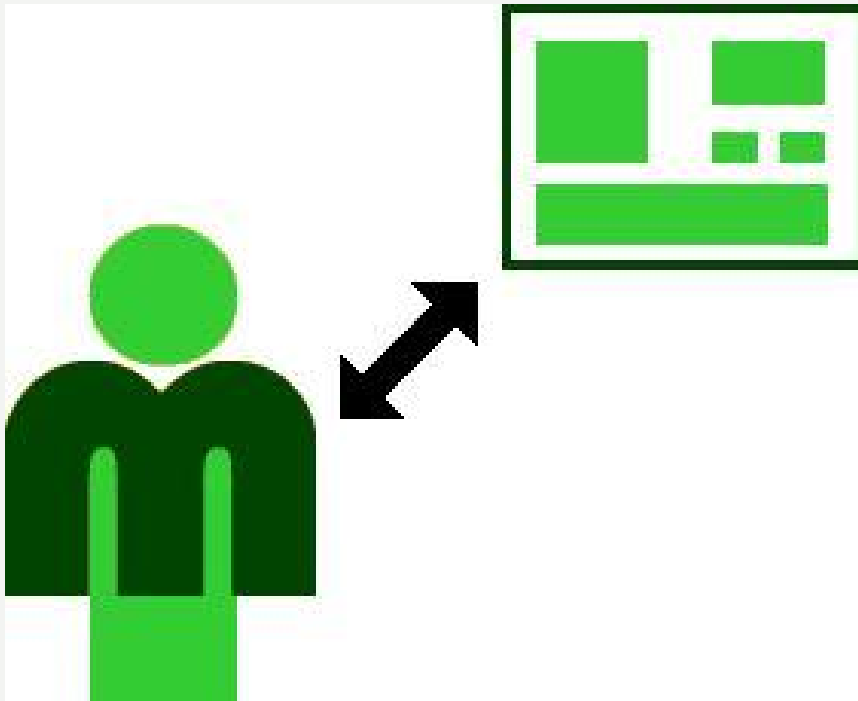
## Café Life in the Digital Age

Churchill et al. 2006

Palo Alto Research Center

- Big touch screen in Café
- Drawing/writing of Scribbles
- Possible to enter e-mail address (problem: privacy)
- only a few spam messages
- Problem: financial burden for the owner





# CHANGE

Edit displayed contents



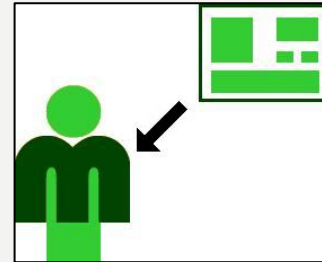
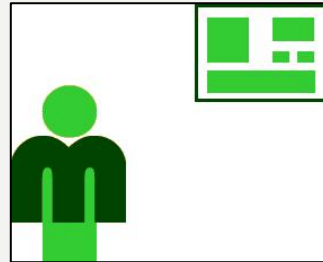


- No projects dealt with this so far
- Just a few ideas:
  1. Big piece of art, drawn by many people
  2. Text marking & writing of side notes
  3. Students need corrections for papers/

Do you see a problem ?

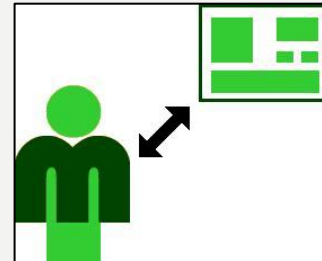
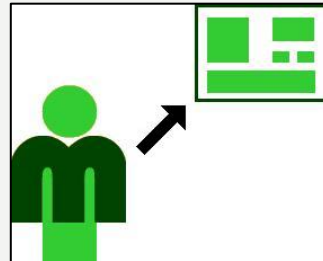
# Kombination of the categories

**VIEW**



**DOWNLOAD**

**INFLUENCE**



**CHANGE**

**ADD**



## Dynamo by Izadi et al. 2003

University of Nottingham

- View and exchange of multimedia files
- Connection with laptop, USB device, mobile phone, etc.
- Participants have personal areas on display
- Each user has another color for identification
- Problem: privacy (files can be stolen)
- Bystanders can see private data (documents, pictures, ...)

**Parcel for Tom**  
Hi Tom,  
Here's the new proposal I've been working on... Any comments welcome. Just drop the latest version here when it's done. Ta  
Harry

**Public Palette**  
Create Note | Create Parcel | Browse Web | Web Cam | Printer

**Dynamo Slideshow**  
**DYNAMO**  
information access and communications across heterogeneous displays in public spaces  
Short talk for Lighthouse visit by Harry Brignull  
harrybr@ccs.susx.ac.uk  
(Dynamo Research Fellow)

**Submission EQUATOR**  
Authors: Frank Bogen, Mike Cook, Steve Miller, GIP Research, Andrew Miles, Tom Farn, Eric Harris, Wiley Smith, Steve Price, Ted Phang, Stuart Cook, Steve Dobson, Steve Stokes, Glenn D'Almeida  
Project title: **Submission EQUATOR**  
Description: The development of an innovative geo-management tool called on the innovative geo-management and cartography  
Information: [http://www.equator.ac.uk](#)

**A Lightweight Approach to Managing Privacy in Location-Based Services**  
Tom Robble, Adrian Fritter, Frank Miller, and Alex Ditt  
1. The School of Computer Science and Information Technology  
The University of Nottingham  
Nottingham, Nottingham Road  
Nottingham NG7 2RD  
United Kingdom  
[http://www.csis.ac.uk](#)

2. Computer Science Department  
Faculty of Applied Sciences  
Edinburgh University  
Edinburgh  
UK  
[http://www.ed.ac.uk](#)

3. Computing Equipment  
Mansfield Vascular Building  
Exeter Medical School  
Exeter  
United Kingdom  
[http://www.ex.ac.uk](#)

**Parcel for Shahram**

**Parcel for Bob**  
Web - Google  
Google  
Web | Images | Groups | Directory | News  
Google Search | I'm Feeling Lucky  
Advanced Search | Customise | Language Tools

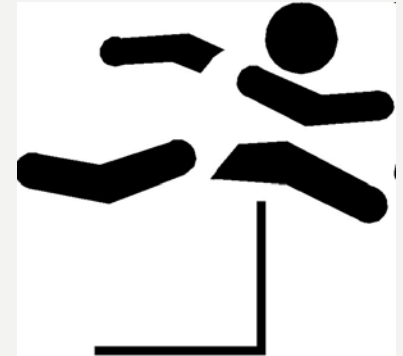
**Parcel For Mia**  
**SOCIALIZER**  
A proposed Dynamo project thread, by Harry Brignull & Simon Lock (2/10/01)  
Problem space:  
For people who are new to the academic world and are not experienced in the subtle skills of socialising or 'networking' with other academics, conferences can be intimidating places. Often delegates leave a conference without having made a single new contact of any value, which is a pity considering the large amount of funding required to visit a conference, and the importance of making contacts. Similarly, even experienced academics have trouble keeping colleagues' names at their fingertips, and with the sheer size of many modern conferences (like CHI) they will also want to maximise the effectiveness of their 'networking' time.

**Parcel for Mia**  
Hi Harry,  
Take a look at the shops of our holiday in Australia. Download them to your laptop if you like. Then you can show your Mum and Dad. See you tonight.  
Mia

Bottom navigation: **Discard** | **Archive** | **Profile** | **Browser** | **Email** | **Edit Profile**

# Obstacles

- Many research projects with good ideas
- user studies had positive results
- Why are public displays still not interactive?



→ Description of some problems

## Problem 1: Privacy

- People are used to personal devices (mobile phone, laptop)
- New situation: big displays, strangers watching
- Polar Defence: Is my mobile number visible?
- Shoot & Copy: Can others see, WHAT I download?
- eyeCanvas: Can somebody watch me drawing?
- Dynamo: Can somebody steal my files?

→ Privacy has to be taken care of!





## Problem 2: Spam

- If users are incognito, spam will appear
  - Video commenting: 19% was spam
  - eyeCanvas (Scribbles): few spam
- Trade-off between privacy and spam problem
- Think about quality assurance





## Problem 3: Funding



- Hardware, software, maintenance cost money
- eyeCanvas was too expensive after tests
- Users are not willing to pay for using the applications
- Polar Defence: even price for SMS too high for some players

→ Business models will be needed





## Conclusion

- Good approaches and applications available
- Categories could help to anticipate upcoming problems

If researchers try to deal with the mentioned difficulties,  
I am sure that public displays will become  
interactive in the future!



Thank you very much for your attention!





## List of References

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- J. Scheible and T. Ojala. Mobilenin: combining a multi-track music video, personal mobile phones and a public display into multi-user interactive entertainment. In MULTIMEDIA '05: Proceedings of the 13th annual ACM international conference on Multimedia, pages 199–208, New York, NY, USA, 2005. ACM.