

# Designing for Large Public Displays

## Seminar Post-Desktop User Interfaces

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# Overview

- 1 Introduction
- 2 Existing applications
- 3 Input methods
- 4 Summary

# Motivation

- interactive displays are well established in collaborative and group-based activities
- shared resource for variety of community-based activities
- used to easily access personal information



# Challenges

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- displays have to be ubiquitous
- techniques needed to notify and communicate with users
- multi-user support
- input techniques
- privacy
  - non-toy interactive use mostly covers private information
  - large displays afford reading



# Overview

- 1 Introduction
- 2 Existing applications
  - Posture/Gesture prototype
  - Plasma Poster
  - Dynamo
  - Other systems
- 3 Input methods
- 4 Summary

# Posture/Gesture prototype

## System description

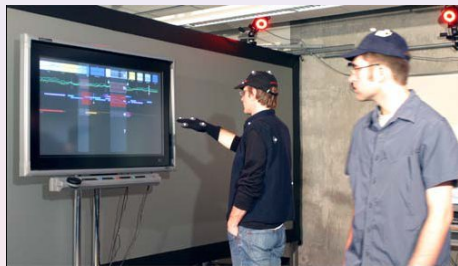
- public ambient *and* personal focused display
- implicit interaction with public information
- explicit interaction with personal information
- supporting multiple users



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## Technology involved

- 50" plasma screen
- SMART Technologies touch sensitive overlay
- Vicon motion tracking system

# Posture/Gesture prototype: Design principles

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## Example

⇒ Video

# Posture/Gesture prototype: Interaction phases

## Ambient Display Phase

getting overall information quickly

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- public information is augmented with personal information

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## Personal Interaction Phase

- direct touch for up-close interaction
- body helps occlude personal information



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## System description

- interactive posterboards
- content sharing within teams, groups, etc.
- complement existing content sharing tools



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## Technology involved

- plasma display oriented in portrait format
- touch interaction



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- **peripheral noticing:** appealing from distance; content changes regularly
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- **social connections:** emphasize social dimension

# Dynamo

## System description

- public interactive surface
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- support multi-user interaction



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## Technology involved

- two 50" plasma screens
- three wireless keyboards and mice as interaction points for multi-user input
- various mobile storage devices like USB pen drives, brought in from the users



# Dynamo: Interaction techniques

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- move information onto the surface
- sources and sinks for media



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- define areas for individual or mediated shared use
- creator restricts interaction with carve region



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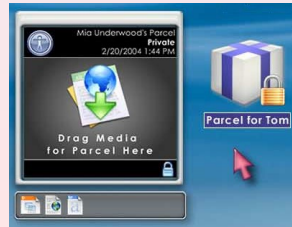
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- allow asynchronous media sharing
- iconified form to save space



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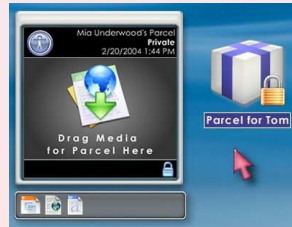
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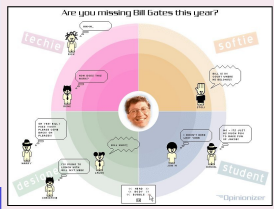
## • Notes:

- asynchronous information sharing
- discussions



# Other systems

## Opinionizer



Blinkenlights



Nike iD advertisement



Blueboard

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- 2 Existing applications
- 3 Input methods**
  - Traditional methods
  - Posture/Gesture system
  - Audience participation
  - Bring your own device
- 4 Summary

# Traditional methods

## Some problems

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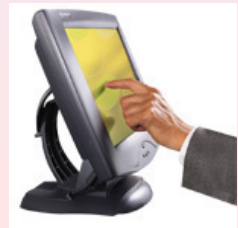
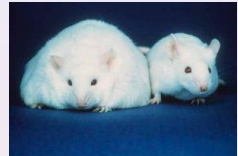
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  - Where would it be?
  - input focus not so clear with multiple users
- **Touchscreen:**
  - technical limitation: multiple users
  - being very close to the display (not necessarily a problem)
  - area out of reach



# Posture/Gesture system

## Problem addressed

interaction without additional devices

## System description

## Advantages

- no additional devices needed
- easy to use
- interact with information from distance

## Not (yet) solved

- prototype needs tracking markers

# Audience participation

Problem addressed

collaborative multi-user input

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three techniques:

- 1 Audience Movement Tracking



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- 2 Beach Ball (shadow) Tracking



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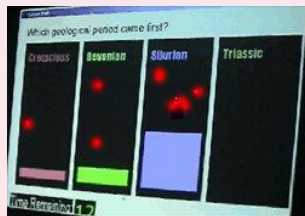
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- 3 Laser Pointer Tracking



# Audience participation

## Advantages

true multi-user input device, with no individual input

- ① different gestures can be trained and recognized
- ② more precise input possible; single users have full control for short period of time
- ③ e. g. good for polls



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- explicitly tracked shadow in the example requires high contrast
- other items could fool the system
- only few people active, so only limited number of participants

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## 3. Laser Pointer Tracking

- Laser pointer required
- difficult to distinguish the own point from others

# Bring your own device

## Problems addressed

- Mouse replacement
- additional Keypad-, Joystick-type interaction
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- Text input (esp. PDA)

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- detection by visual codes (Point & Shoot)
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## Example

⇒ Demo

# Bring your own device

## Advantages

uses devices most people carry around



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## Not (yet) solved

- not everybody has an adequate mobile phone
- getting the Java applet

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# Benefits and problems

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- multiple user support
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- access to personal data
- can be used for advertisement

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## Problems

- privacy
- new metaphors needed
- active research field

# Summary

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  - Plasma Poster
  - Dynamo
- Input methods
  - Posture/Gesture prototyp
  - Audience participation
  - BYOD

# Questions?

## Further reading

- Information Voyeurism: Social Impact of Physically Large Displays on Information Privacy Microsoft Research  
*[research.microsoft.com/users/marycz/chi2003voyeur.pdf](http://research.microsoft.com/users/marycz/chi2003voyeur.pdf)*
- Dynamo: The introduction of a shared interactive surface into a communal space
- Techniques for Interactive Audience Participation  
*<http://www.monzy.org/audience/ICMI-2002-finalpub.pdf>*
- Posture/Gesture prototyp  
*[www.dgp.toronto.edu](http://www.dgp.toronto.edu)*