Interacting with the Ubiquitous Computer

Towards Embedding Interaction

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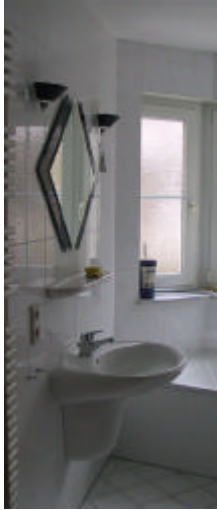Matthias Kranz

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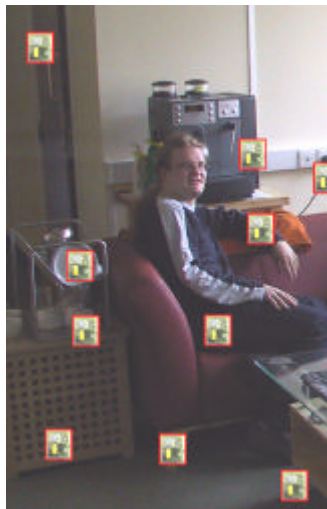University of Munich, Germany

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Questions

- **What is "Ubicomp" Interaction?**

  Extending Standard HCI

  Implicit Interaction

- **What about Embedding Information?**

  Solve the Problem with the Context

  Put Prototyping in Place

- **What Design Guidelines can be given?**
  A, B and C

Interactive Environment

Future Interactive Environment

Future Interactive Environment

# Design Space for Interactive Systems

		mode of interaction	
		explicit	implicit
modality	command line		
	GUI & direct manipulation		
	Gestures & Speech		
	tangible and physical UIs		

Implicit Interaction

Implicit Human Computer Interaction:

The interaction of a human with the environment and with artefacts which is aimed to **accomplish a goal**. Within this process the system acquires **implicit input** from the user and may present **implicit output** to the user.
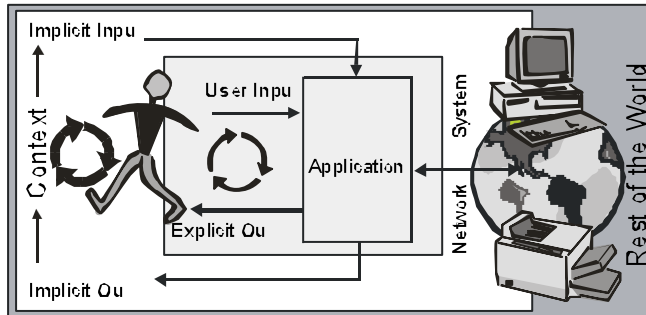
Implicit Interaction

Implicit Input:

Actions and behaviour of humans, done **to achieve a goal** and are not primarily regarded as interaction with a computer, but captured, recognized and interpreted by a computer system as input.

Implicit Output:

Output of a computer that is **not directly related to an explicit input** and which is **seamlessly integrated** with the environment and the task of the user.

Implicit and Explicit Interaction
Sensor Controlled Automated Door

Implicit Use:
go through the door

Explicit use:
hold the door open

Explicit use requires an understanding of the
conceptual model of the user interface!

Basic Questions on Information

Where is information created?

- How to acquire and understand it?
- How to represent and store it?
- How to distribute and use it?

Where is information used?

- How to display information?
- What to present?
- Where and when to show information?

Embedding Information Prototyping

Short Term Temperature or Sun Intensity Forecast / Schedule of the Day

- Shelf / Drawer / Cupboard Display
- Wardrobe Display
- Key Display

Probability of Rain

- Umbrella Stand Display
- Key Table Display

Open Questions

User studies will show …

- where and how people want information to be embedded
- how well informed people are using embedded information
- how people rate the added value of such a system
- how people perceive embedded information compared to pushed information

Design Guidelines Found

It is vital to embed information …

- where and when it is useful
  use displays where people make decisions / choices
- in a most unobtrusive way
  use ambient media / calm technology
- such that no interaction is required
  use dedicated displays tailored for specific tasks

Summary

- Description of the Anticipated Mode of Human Computer Interaction

- Motivation of the large Extension of the Design Space by Implicit Interaction

- Detailed Treatment of Implicit Output using an Over-provision of in-place Embedded Information Displays

- Presentation of Prototypes Serving to Confirm Results

- Proposal of a Set of Design Issues and Guidelines

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Thank You for Your Attention!

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There is no more slide …
Honest!