# Human-Computer Interaction

## Exercise 1

TECHNISCHE UNIVERSITÄT DARMSTADT

SS 2013

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*Part of this slide set is based on "Designing Interactive Systems 1", by Prof. Dr. Jan Borchers, RWTH Aachen*

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# Agenda

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- **Recall Design Principles**
- Exercise

# Recall Design Principles

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- **Conceptual Models**
- Affordances
- Visibility and Feedback
- Mapping
- Constraints
- Metaphors

# Conceptual Model

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„A conceptual model is a high-level description of how a system is organized and operates.“

- Johnson and Henderson (2002)

- Allows to predict effects of our actions
- Allows to cope with problems
- Formed through experience, practice, instruction

# Recall Design Principles

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- Conceptual Models
- **Affordances**
- Visibility and Feedback
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# Affordances

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> "[...] the term affordance refers to the perceived and actual properties of the thing, primarily those fundamental properties that determine just **how** the thing could **possibly** be **used**."
>
> - Norman (DoET p. 9 – 2002)

- Affordances are the actions that the design of an object suggests to the user
- Affordance can be substituted with "is for"
- Examples: knobs are for ("afford") turning, slots are for inserting, chairs are for sitting

# Recall Design Principles

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- Conceptual Models
- Affordances
- **Visibility and Feedback**
- Mapping
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# Visibility

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- How do you switch on the answering machine?


- No! Call 1999



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# Feedback

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> "Sending back to the user information about what action has actually been done, what result has been accomplished."
>
> - Norman (DoET p. 27 – 2002)

- Modern systems
  - Many functions
  - Little feedback

# Recall Design Principles

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- Conceptual Models
- Affordances
- Visibility and Feedback
- **Mapping**
- Constraints
- Metaphors

# Natural Mapping?

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- How are the controls mapped?


Source: http://bit.ly/16e0m0



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# Recall Design Principles

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- Conceptual Models
- Affordances
- Visibility and Feedback
- Mapping
- **Constraints**
- Metaphors

# Physical Constraints

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- **Restricting the possible actions** that can be performed
- "Inverse" of affordances, possibly augmenting them
- Goals
  - Avoid usage errors
  - Minimize the information to be remembered

Source: baddesigns.com



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# Logical Constraints

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- Use logical conclusions to exclude certain solutions
  - Example: all parts of jigsaw puzzle are to be used
- Natural mappings often use logical constraints

# Semantic Constraints

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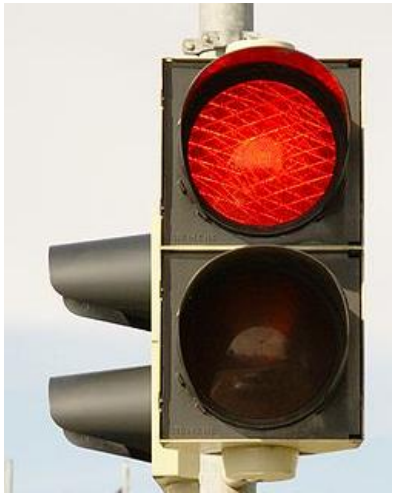
- Use our common knowledge about the world and particularly the meaning of the current situation
- Example: Driver‘s figurine in a model plane construction kit has to sit facing forward to make sense
- Powerful means to improve intuitiveness

- But: Only rules that are valid throughout your user population!

# Cultural Constraints

- Rely on generally accepted cultural conventions
- Example: red = stop/attention
- This applies only to a specific cultural group!
  - Hand gestures are not interpreted equally
  - Writing direction differs
  - ...



Source: http://commons.wikimedia.org/wiki/File:Ampel_3931.jpg

# Recall Design Principles

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- Conceptual Models
- Affordances
- Visibility and Feedback
- Mapping
- Constraints
- **Metaphors**

# Interface Metaphors

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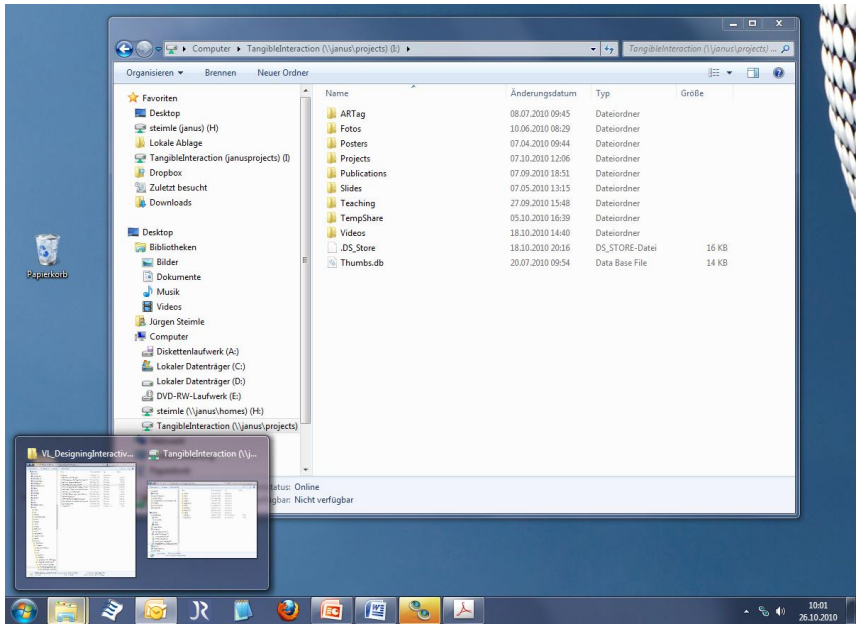
- Designed to be similar to a physical entity

- Example: Desktop metaphor
  - Monitor is treated as if it is the user's desktop
  - Objects (documents, folder, ...) can be placed and moved on this desktop
  - Objects can be opened into a window (represents a paper copy)
  - Objects can be moved to the recycle bin, the printer, ...



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# Agenda

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- Recall Design Principles
- **Exercise**

# Task

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- Design a user interface for an alarm clock
  - Functions:
    - Shows the current time
    - Allows to set the current time
    - Possibility to independently set to two alarm times
    - Alarm on/off/snooze (independently for each time)
  - Take context of use into account!

# Find a design rationale

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Justify why your solution provides a good **usability**

- Which **affordances** has the alarm clock?
- Are the functions **visible** to the user and is there an appropriate **feedback**?
- What **mappings** did you use? Are they natural?
- Which **constraints** (physical, logical, semantical) has your design to support usability?
- Did you use **metaphors**? If yes, which ones?

# Setup

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- Form groups of max. five students

- Schedule
  - 30 min for designing the alarm clock
  - 20 min presentation & discussion
    - 4 groups à 5 min