

virtUOS

Zentrum zur Unterstützung virtueller Lehre
der Universität Osnabrück

Automation Techniques for Broadcasting and Recording Lectures and Seminars

sinn₀₃

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Oldenburg

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- For most people watching television or video is the most common way to get information
- Recorded information can be repeated for a better understanding and is more accurate than handwritten records
- Highly decorated scientist are seldom teaching at your university and in most cases it is expensive to travel
- Famous lecturers could enrich normal seminars with their guest appearance
- If personnel is missing some needed lectures could be imported from an other university
- Usually television does not offer the possibility to ask questions (comprehension questions, i.e.)

Recording and broadcasting lectures becomes more and more important

- **Technical Reasons**
 - Video recording and video conferencing equipment gets affordable
 - Students often have broadband internet access
- **Political Reasons**
 - Scientific personnel is very expensive
 - Universities have to offer a good quality of teaching with less money
 - Interesting video conferences or high quality lecture recordings can be an advantage in competition for an university

- Normally a videographer or at least a technician is needed to control cameras and as a director
- Many procedures can be automated
 - Turning the equipment on/off
 - Connecting to the video conference
 - Start recording device
 - Moving the cameras
 - Selecting the input
 - Selecting the media for the presentation
- A professional videographer will always be better than an automated system

- The lecturer should be shown from a close angle
 - Face expressions
 - Gestures
 - Looks more interesting
- The lecturer should be allowed to move
 - But the camera should not follow every movement
- Students should be shown if they say something
- The audience should be shown from time to time

- **Active Selection**
 - Every participant has a device to select camera positions (i.e. infrared remote)
 - Moderator can select every camera position
 - Students can select their own camera position or switch back to the lecturer
- **Passive Selection**
 - Computer vision detects the position of the lecturer
 - Students who ask a question are located by microphone array techniques

- Active selection
 - Pros
 - Technician is only needed for service and setup
 - Can be used in mobile version (flying classroom)
 - Good control about what will be shown
 - Cons
 - Positions still have to be selected
 - Moderators need training
 - Very static framing
- Passive selection
 - Pros
 - No training needed
 - Better framing than active selection
 - Cons
 - Very little control about what will be shown

- Cameras with pan-tilt-drive (i.e. Sony EVI D-31)
- AV-switches or mixer with computer interface (i.e. Kramer VS-1604 or Panasonic WJ-MX50)
- Several microphones
- At least one computer to control the other hardware
- A video conferencing device (i.e. Polycom Viewstation)
- Recording devices (i.e. a VCR or a computer with Helix Producer)
- For active selection
 - IR-remotes and IR-receiver (i.e. IR-Trans)
- For passive selection
 - Low cost cameras for computer vision (i.e. Super Circuit PC60XSA)

What are Lecture-Recordings

The screenshot displays a software interface for lecture recordings. At the top left, the logo of Technische Universität Clausthal is visible. The main content is divided into two primary sections:

- Videoansicht (Video View):** Located on the left, it shows a live video of a lecturer standing in a classroom. Below the video is a playback control bar with a progress slider and a 'real' button.
- Folienansicht (Slide View):** Located on the right, it displays a presentation slide titled 'Systematik des Reglerentwurfs'. The slide features a block diagram of a control loop with the following components:
 - Inputs: Referenzwert, Eingangsgröße, Xsoll
 - Summing junction: A circle with a '+' sign and a '-' sign.
 - Controller: A blue box labeled 'Regler'.
 - Plant: A blue box labeled 'Stellglied'.
 - System: A blue box labeled 'System'.
 - Output: Ausgangsgröße, Istwert, Xist
 - Feedback: A blue box labeled 'Meßglied' that feeds back into the summing junction.

Below the slide view, a navigation bar shows a list of slides with their respective timestamps:

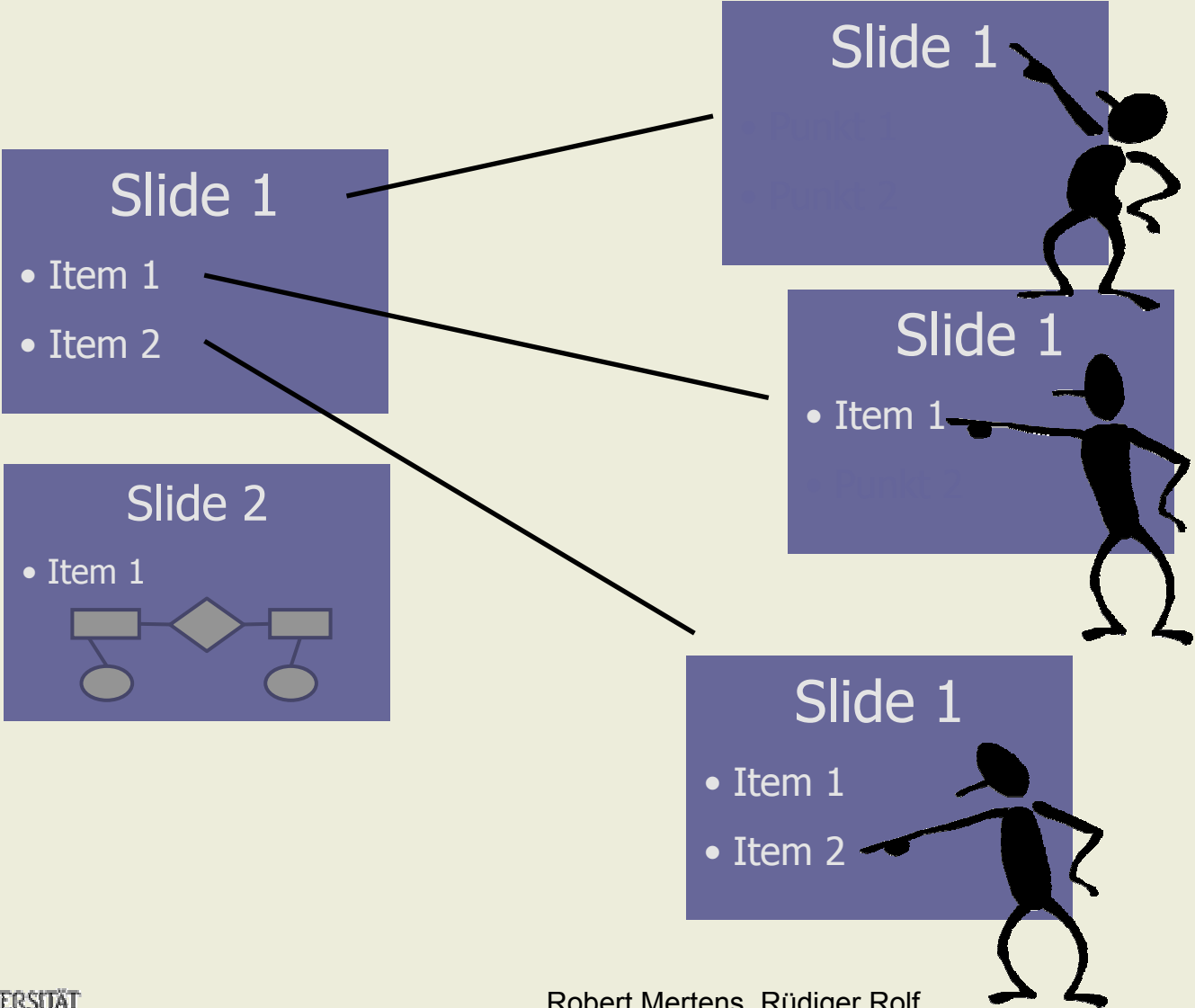
- Methodik Systematik des... (1:19)
- Inhalt (3:37)
- Was ist Regelung... (4:28)
- Was ist Regelung... (5:20)
- Was ist Regelung... (6:01)
- Wann ist die... (8:02)

Three large blue arrows point towards the interface: one from the left towards the video view, one from the bottom towards the navigation bar, and one from the right towards the slide view.

- automatic synchronisation
- annotations
- order of animations
- basic navigation features
 - slide-based navigation
 - title-based navigation
 - Full-text search

- What is missing in state-of-the-art tools
 - coarse-grained pictures
 - searchability
 - navigation
 - animation-steps
- SVG (Scaleable Vector Graphics) as a solution:
 - vectorbased
 - text representation
 - links within the slides
 - animated ...

Using Links for Navigation



Using Links for Navigation

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The diagram illustrates navigation between slides using links. It shows three instances of Slide 1 and Slide 2, with stick figures pointing to specific items and lines indicating navigation paths between them.

- Slide 1 (Left):** Contains "Item 1" and "Item 2".
- Slide 2 (Middle):** Contains "Item 1" and a diamond-shaped icon.
- Slide 2 (Right):** Contains "Item 1", a diamond-shaped icon, and a list with items "1" and "2".

Navigation paths are shown as lines connecting the items on the slides. Stick figures are shown pointing to the items, indicating the user's current position and the target of their navigation.

UNIVERSITÄT OSNABRÜCK

Name des Vortragenden

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The screenshot displays a virtual lecture environment. At the top left, a video window shows a lecturer with a beard and glasses sitting at a desk with a laptop. Below the video is an 'Anmerkungen' (Annotations) section with a 'Folie 1' (Slide 1) thumbnail and a text area for notes. The main content area features a large blue slide titled 'Kapitel 6 Das relationale Modell' with a large purple arrow pointing downwards. To the right of the main slide is a vertical sidebar with links: [video](#), [folie](#), [optimal](#), [user](#), and [save](#). Below the main slide is a slide navigation pane with four thumbnails: 'Folie 1 (00:00:00)', 'Folie 2 (00:00:59)', 'Folie 3 (00:04:15)', and 'Folie 4'. The thumbnails for Folie 2 and 3 are visible, showing text and a diagram respectively. At the bottom, a control bar includes a play/pause button, a progress slider, and a 'real' button. The bottom status bar shows '225,0 Kbit/s SureStream' and a timer '00:47:13/33:17.7'. Three large purple arrows point to the video window, the main slide, and the slide navigation pane.

- Combination and further automation of these tools is only a matter of time
- Technically it will be easy and cheap to create an archived or broadcasted lecture
- Didactic concepts for distributed lectures are needed
- Structures are needed to promote and exchange the lectures
 - The effort of organising a broadcast of a lecture is still very high
 - Find someone who will broadcast a lecture
 - Find viewers for the lecture
 - A system is needed where universities can check, what is available and book it easily

- Knaden, A. & Rolf, R. (2003). Automatisierte Kamerasteuerung zur Übertragung von Seminaren und Vorlesungen. In: V. Dötsch, G. Schade & K. Hering (Hrsg.), *e-Learning and beyond. Proceedings of the Workshop on e-Learning 2003, HTWK Leipzig, 14.-15. Juli 2003* (p. 87-97).
- Rui, Y., Gupta, A. & Grundin, J. (2003). Videography for Telepresentations. In: CHI letters, Volume no.5, Issue No. 1, CHI 2003, April 5-10, 2003, Ft. Lauderdale, Florida, USA (p. 457- 464)