Multimedia-Systems: Applications

Prof. Dr.-Ing. Ralf Steinmetz
Prof. Dr. Max Mühlhäuser

**MM**: TU Darmstadt - Darmstadt University of Technology,
Dept. of Computer Science
TK - Telecooperation, Tel.+49 6151 16-3709,
Alexanderstr. 6, D-64283 Darmstadt, Germany, max@informatik.tu-darmstadt.de Fax. +49 6151 16-3052

**RS**: TU Darmstadt - Darmstadt University of Technology,
Dept. of Electrical Engineering and Information Technology, Dept. of Computer Science
KOM - Industrial Process and System Communications, Tel.+49 6151 166151,
Merckstr. 25, D-64283 Darmstadt, Germany, Ralf.Steinmetz@KOM.tu-darmstadt.de Fax. +49 6151 166152
GMD - German National Research Center for Information Technology
httc - Hessian Telemedia Technology Competence-Center e.V.
## Scope

<table>
<thead>
<tr>
<th>Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning &amp; Teaching</td>
</tr>
</tbody>
</table>

### Usage

- Content Processing
- Documents
- Security
- ... Synchro-nization
- Group Communications

### Services

- Databases
- Programming
- Media-Server
- Operating Systems
- Communications
- Opt. Memories
- Quality of Service
- Networks

### Systems

- Computer Architectures
- Compression
  - Image & Graphics
  - Animation
  - Video
  - Audio

Contents
Contents

1. Overview
2. An inside look at the Aspects
   - Media Preparation / Media Manipulation
   - Change data by editing single medium
   - Media Integration
   - Media Transmission
   - Media Usage
3. Case Study
   - Cooperative Work using i-Land
4. Case Study: "Ubiquitious Computing"
5. Future Trends
1. Overview

Media Preparation
- media specific representation by computer

Media Manipulation
- media specific changes

Media Integration
- integrated media objects

Media Transmission
- content at desired time at desired place

Media Usage
2. An inside look at the Aspects

Media Preparation / Media Manipulation

Media Capture or Data Generation
- Audio
- Video
- Text, Still and Motion Graphics
- 2D / 3D
  - Tools:
    - using (special) hardware, device driver and system SW or dedicated applications

Change data by editing single medium
- Text
- Pictures
- Graphics
- Animation
- Audio
- Video
  - Tools:
    - large variety media specific editors (Photoshop, GIMP, SoundTools ...)

http://www.kom.e-technik.tu-darmstadt.de
http://www.tk.informatik.tu-darmstadt.de
© R. Steinmetz, M. Mühlhäuser
Media Integration

Now step forward to an integrated view

- Multimedia Editors
- Hypermedia-/Hypertext Editors
- Authoring Tools

Important task within overall process
- here it becomes Multi-media

Conception → Design → Collection → Integration → Test
Media Transmission

Major Categories:

- **Interactive Services**
  - Conversation Services
  - News Transmission Services
  - Inquiry Services
  - Tele-Action Services

- **Distribution Services**
  - Pay-per-View
  - Near Video-on-Demand
  - True Video-on-Demand

Strong relationship to Communication /QoS

- **Bandwidth**
- **Response Time**
- **Symmetric vs. Asymmetric Channels**
- ...
Media Usage

Large variety of applications, we picked up only a few

- Electronic Newspapers and Books
- Kiosk Systems
- Tele Shopping

- Entertainment
  - Virtual Reality
  - Interactive Video
  - Interactive Audio
  - Computer Games
  - ...

© R. Steinmetz, M. Mühlhäuser
3. Case Study
Cooperative Work using i-Land

Motivation

Tools (Hardware and Software) to support
- Creative Processes
- Cooperative Work
- Interactivity
- Adaptivity
- ...
i-Land (cont.)

Roomware
• to integrate computer components into a room

DynaWall
• drag / drop
• throw
• ...

InteracTable
• no strict up / down
• place and manipulate
• ...
i-Land (cont.)

CommChair
- integrated computers or laptop “docking”
- communication via wireless LAN
- user profiles
- ...

Components (HW + SW)
- form Dynamic Offices
- working environments of the future?
4. Case Study: "Ubiquitous Computing"

Ubiquitous Computing vs. Virtual reality
- Computer in the world vs. world in the computer
- invisible (very many) computers
- e.g. towards "Body Area Networks"
- devices distribute information, to anybody in small range

Example "MediaCup Project"
- (http://www.teco.uni-karlsruhe.de/)
- MediaCup is an ordinary coffee cup augmented with
  - sensing, processing and communication capabilities,
  - to collect and communicate general context information in a given environment
5. Future Trends

Major issues:

- **Towards Distributed Applications**
- **Need Portability and System-Independence**
- **Better Support for User Activity**
  - e.g. Interactive TV, ...
  - to passively consume things => to actively change and influence things
- **leads to:**
  - Bi-directional Flow of Information

**Variety of new (still undiscovered) Application Domains**