
Strategies for Self-Organization and Multimodal Output Coordination in Distributed Device Environments

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Bundesministerium
für Bildung
und Forschung

Outline

- Smart Home Entertainment
 - Examples
 - Multimedia Challenges
- Dynamite Multimedia Presentations
 - Architecture
 - Strategy
- Home Entertainment Demonstrator
- Related Work
- Conclusion

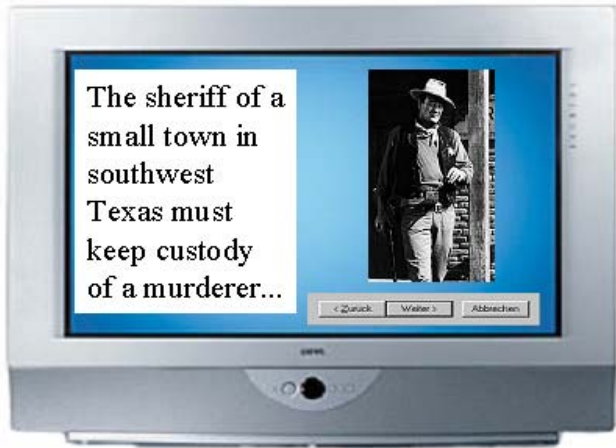
Home Entertainment Devices



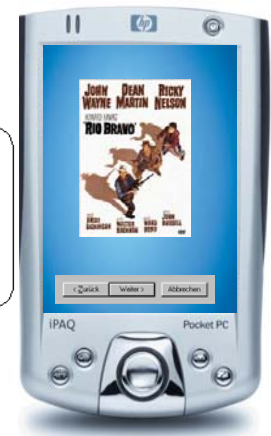
Smart Living Room



Smart Multimedia



The sheriff of a small town in southwest Texas must keep custody ...



Smart Multimedia at Home: How ?



Spatial Distribution of IO Devices



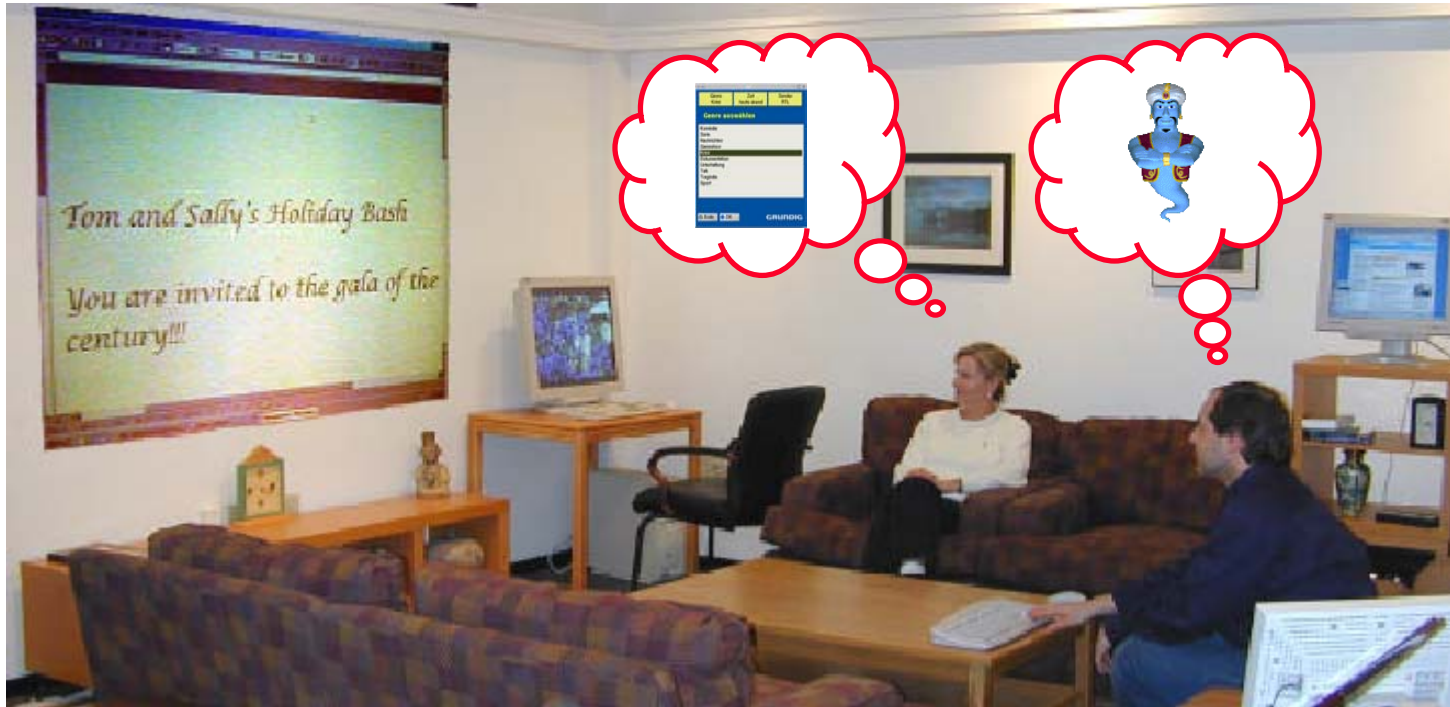
Resources of IO Devices



Context



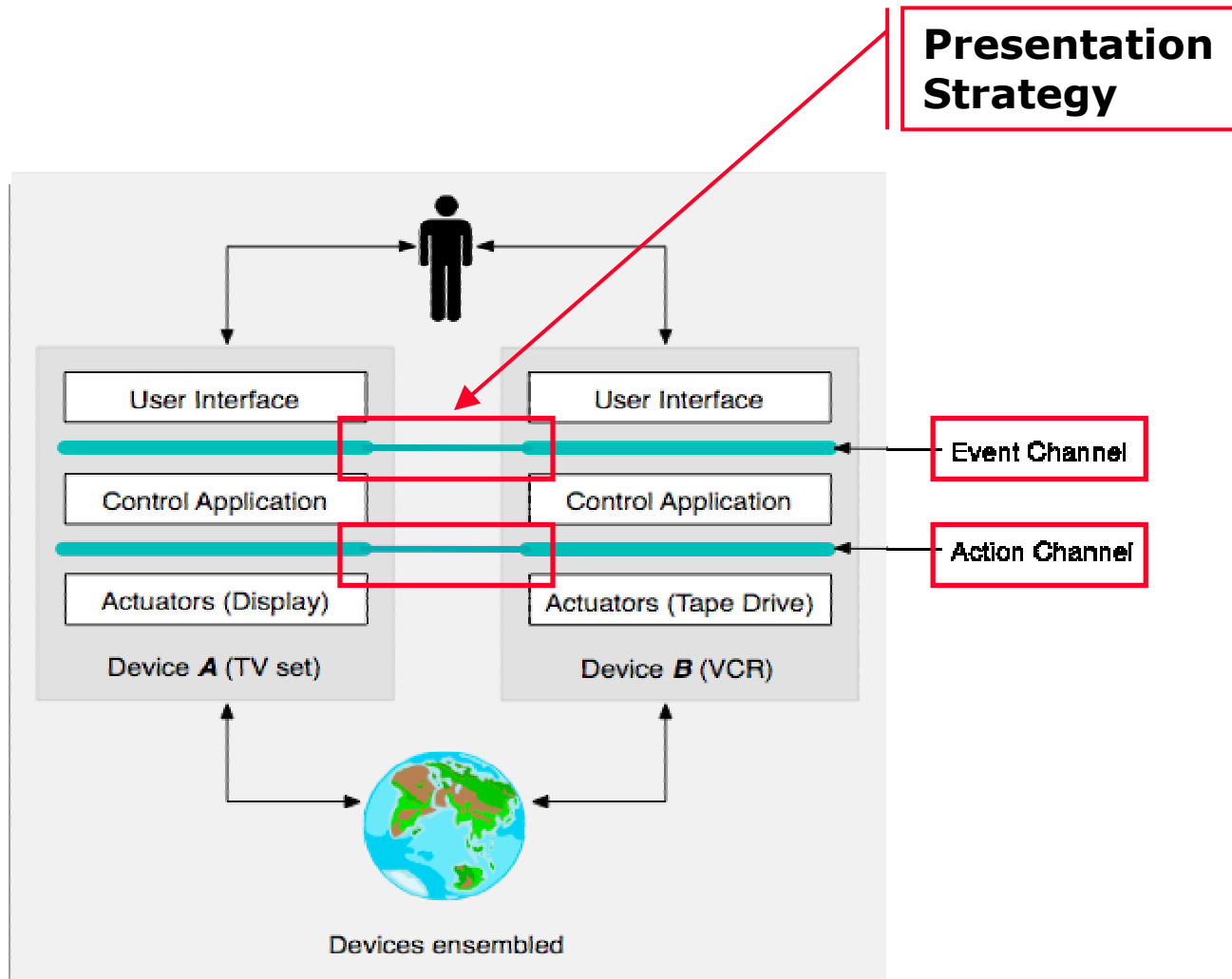
Preferences



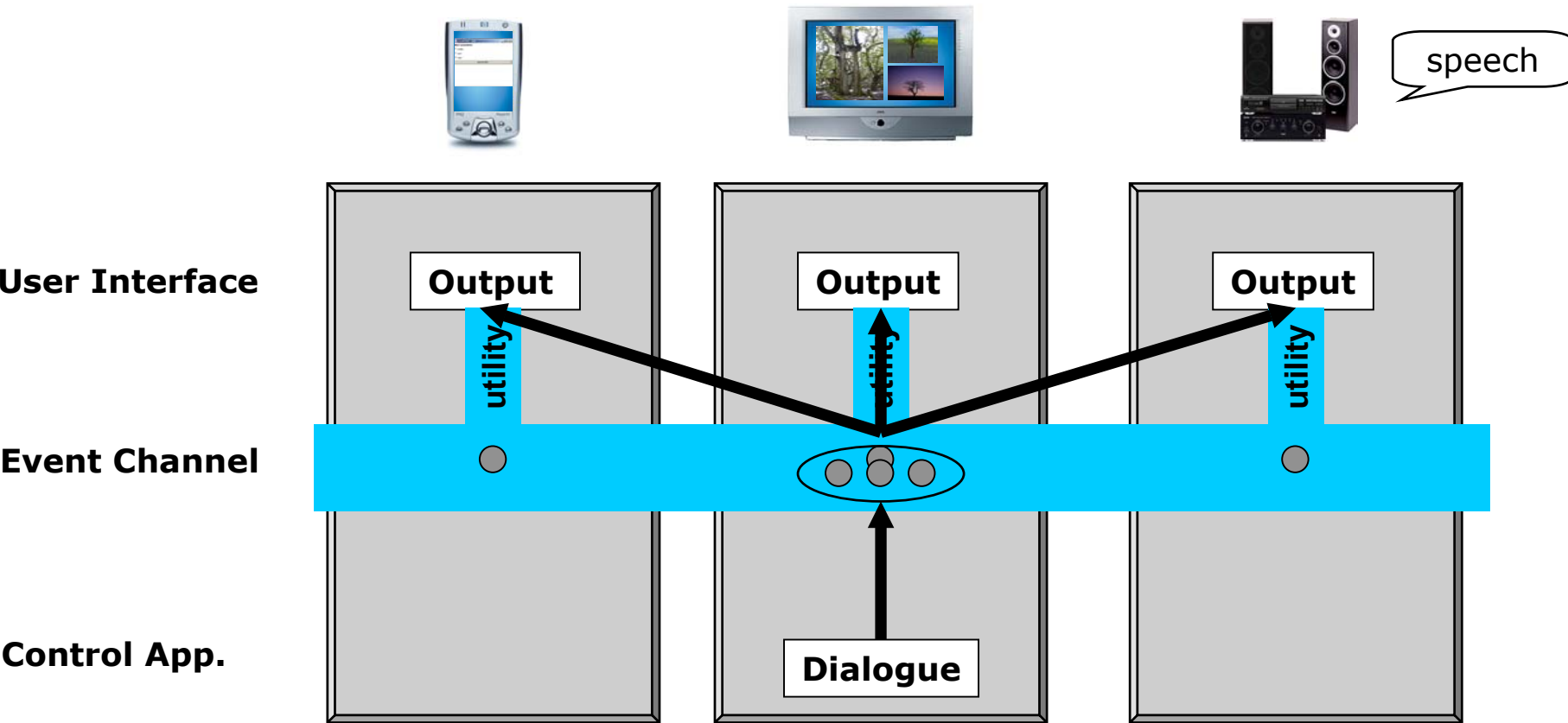
Dynamic Addition/Retraction



DynAMITE Topology



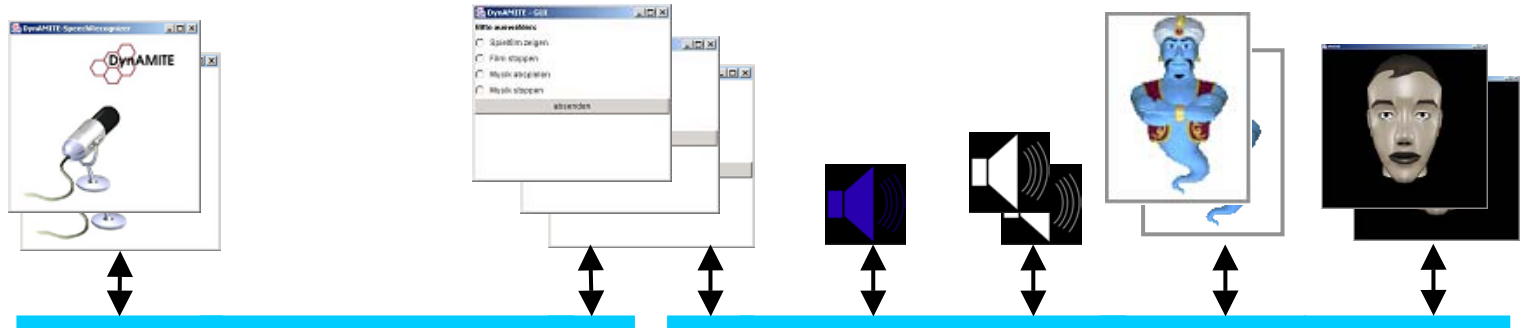
Event Channel Presentation Strategy



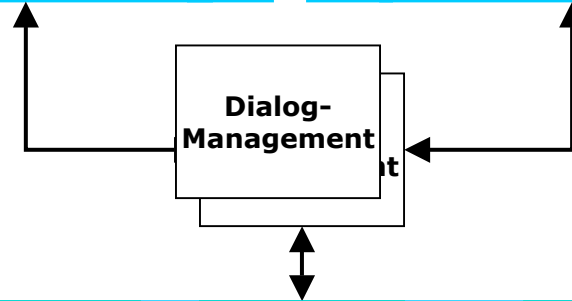
Home-Entertainment-Demonstrator

Home-Entertainment-Demonstrator

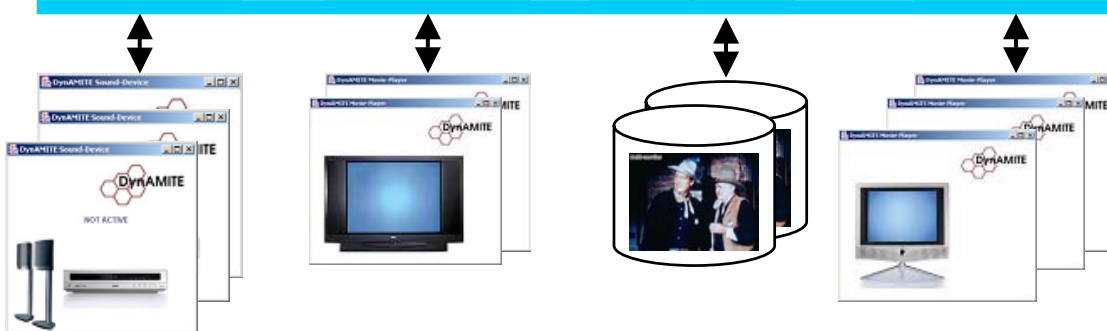
UI



Control



Act.



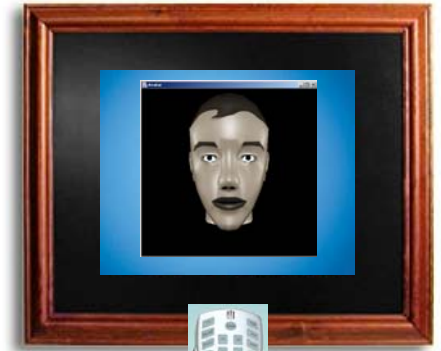
Some Examples



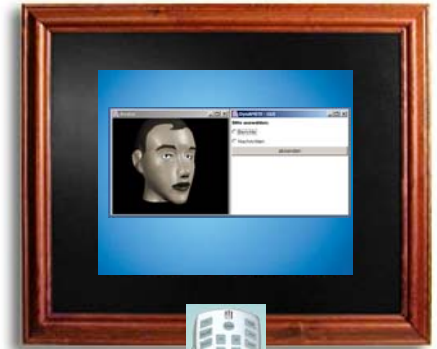
Some Examples



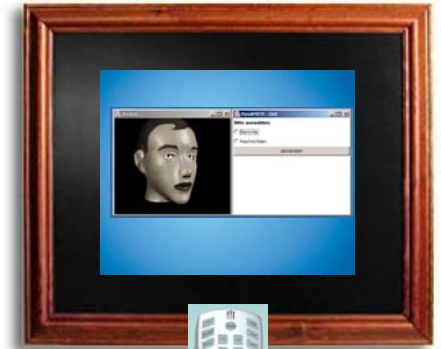
Some Examples



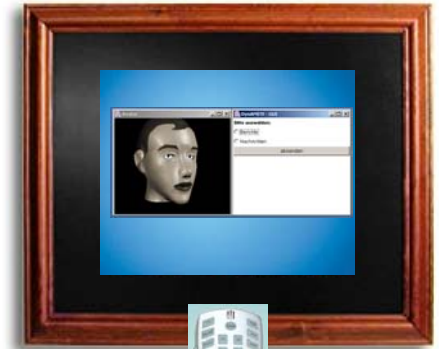
Some Examples



Some Examples



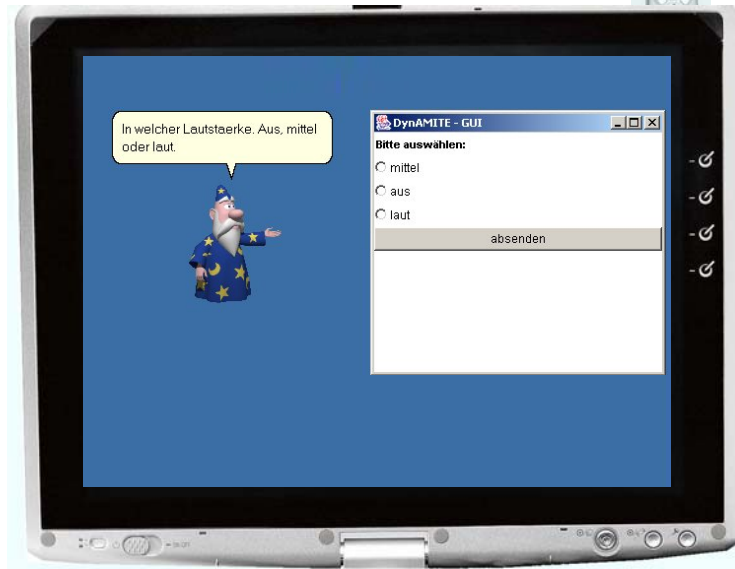
Some Examples



Some Examples



Some Examples



Related Work

- **Embassi, SmartKom:**
 - [Herfet, Kirste, Schnaider, 2001], [Wahlster, 2003]
 - Fixed information flows
 - Not extensible to new devices
- **EasyLiving:**
 - [Brumitt et al., 2000]
 - Adapts UI to user location and orientation
 - Tracks device locations
 - Single-device UI
- **Philips Home Lab WWICE:**
 - [Baldus 2000]
 - Connect/disconnect TV sets at runtime
 - TV shows / music follow the user
- **Peach:**
 - [Kruppa 2004]
 - Multiple PDAs + public displays
 - Shared multi-user presentations
- **[Kray, Krüger, Endres, 2003]**
 - Architecture for multi-device presentation planning
 - Prefetching, starting, stopping, synchronization
 - SMIL presentations

DynAMITE Website

<https://www.dynamite-project.org>

Downloadable demonstrator(s)

Java API

Problem decomposition /
conflict resolution strategies

SodaPop [Kirste,
Hellenschmidt 2004]

The screenshot shows a Mozilla browser window displaying the DynAMITE website. The browser's address bar shows the URL <http://www.igd.fhg.de/igd-a1/dynamite-project/>. The website header features the DynAMITE logo (a cluster of red hexagons) and navigation links for "Kontakt", "Hilfe", and "English".

The main content area is divided into several sections:

- Navigation:** A vertical list of links on the left side: [Was ist DynAMITE?](#), [Partner](#), [Publikationen](#), [Downloads](#), [Termine](#), [Kontakt](#), [Interaktiv](#), and [Ressourcen](#).
- API for developing own agent topologies:** A list of features:
 - fully extensible by new components during agent framework life time
 - powerful agent selection strategies
 - easy to use
 - with sources
- Some Demos:** A list of requirements:
 - full Java (JDK 1.3.1 or higher)
- Theoretical Background:** A section titled "Some theoretical Background" with sub-sections:
 - The demonstrators:** "First demonstrator showing the basic principles of self-organization" and "Second demonstrator applying a powerful agent selection strategy".
 - The entertainment demonstrator:** This section includes several small window screenshots:
 - "DynAMITE Speed-Dialer" showing a microphone icon.
 - "DynAMITE Speed-Device" showing a "NOT ACTIVE" status with a speaker icon.
 - "DynAMITE Music-Player" showing a television icon.
 - "DynAMITE Music-Player" showing a computer monitor icon.
 - "DynAMITE Music-Player" showing a 3D head model.
- How to implement own agent topologies ?** A list of implementation steps:
 - The framework API
 - Implementing own output agents and coordination strategies

Conclusion

- UbiComp in Home Entertainment Environments needs flexible infrastructures
- Multimedia in Home Entertainment:
 - Dynamic/heterogeneous IO environments
 - Context-adaptive output
 - Multi-display presentations
- DynAMITE:
 - Self-organization IO devices
 - Ad-hoc integration
- Future Work:
 - User Preferences
 - Multimedia movie database
- For more:
<http://www.dynamite-project.org>