Orchestrating Output Devices - Planning Multimedia Presentations for Home Entertainment with Ambient Intelligence

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Outline

- Smart Living Room
- Multiple Output Devices
- State of the Art
- DynAMITE Home Entertainment Demonstrator:
  - Approach
  - Architecture
  - Strategies
- Conclusion

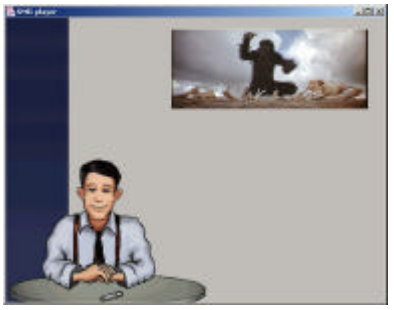
Smart Living Room

Multiple Output Devices

Related Work

- **Pebbles**:
  - [Meyers et al., 2004]
  - Personal Remote Controller
  - Self-descriptions of applications
  - Automatic generation of GUI-speech interface
  - No multimedia output coordination
- **Peach:**
  - [Kruppa 2004]
  - PDA + public display
  - Animated character
  - Shared multi-user presentations
- **[Braun et al., 2004]**
  - Multi-device interfaces
  - XHTML-XFORMS, speech interface
  - No multimedia output coordination
- **[Kray, Krüger, Endres, 2003]**
  - Architecture for multi-device presentation planning
  - SMIL presentations
  - Central server

DynAMITE Demonstrator



- Devices:
  - TV Set, PDA, 17" Digital Picture Frame
- Multimodal dialogue system
- User interface:
  - Speech recognition, GUI
  - Animated character, speech synthesis
  - SMIL presentations
- Application: Movie information system

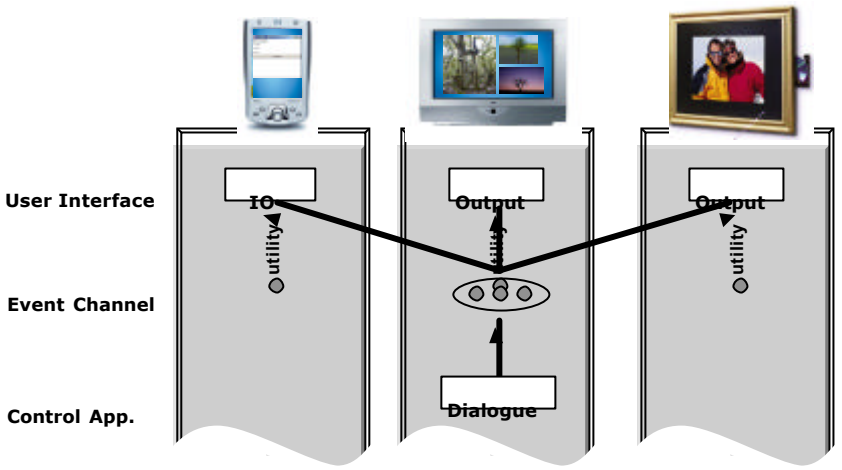
DynAMITE Demonstrator: Features

1. Character-picture-speech presentation
   ➔ Dynamic layout generation

2. Text presentation
   ➔ No pre-generated media

3. Ad-hoc adpation:
   - New output device
     ➔ display additional picture
   - Switch off TV output
     ➔ reroute speech output

DynAMITE Presentation Strategy



Conclusion

- DynAMITE:
  - Home entertainment scenario
  - Planning approach
  - SMIL presentations
- Features:
  - Dynamic output generation
  - Multi-device presentations
  - Ad-hoc integration
- Future work:
  - User study
  - IO Preferences
- More about DynAMITE:
  - Middleware ➔ Michael Hellenschmidt, **Friday, 10:20**
  - Meeting Room Scenario ➔ Ali A. Nazari Shirehjini, **Friday, 10:40**
  - **http://www.dynamite-project.org**

Acknowledgements

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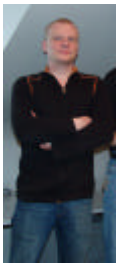
- Dynamite staff:

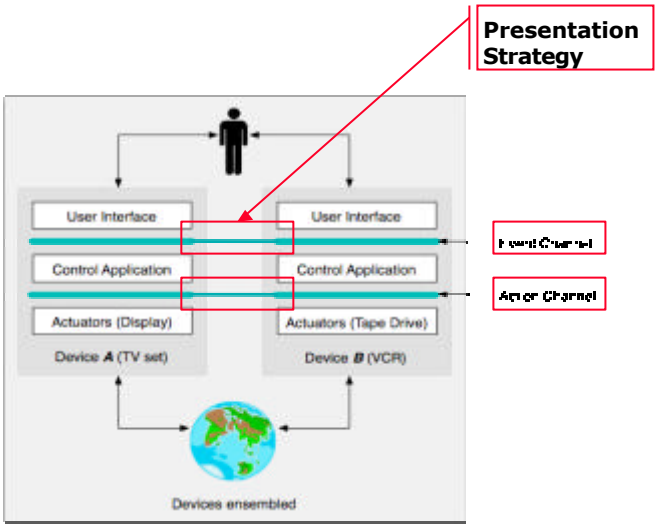




DynAMITE Presentation Strategy

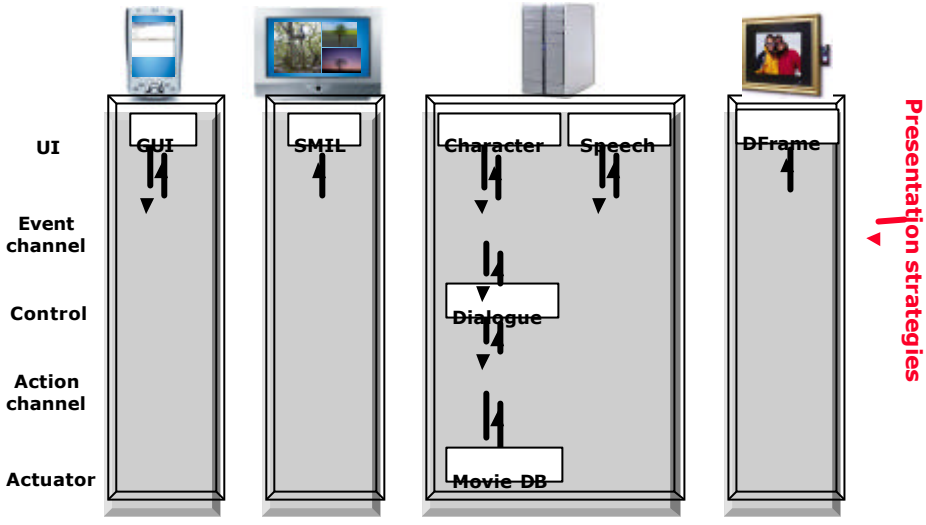
```
(define-plan-operator
 :header (A0 (build-smil-pres ?rc-id ?im-url))
 :constraints
   (*and* (
      ;; there is an output component of type agent
       (BELP(rc-type ?rc-id-2 agent))
       ;; which produces speech output
       (BELP(output-unimodality ?rc-id-2 <speech-type>))
       ;; in form of wav files
       (BELP(output-medium ?rc-id-2 wav ?om-url))))
 :inferiors (
    ;; initialize a picture-speech presentation
     (A1 (build-img-with-speech ?im-url ?rc-id-2 ?om-url))
    ;; solve constraints and generate smil file
     (A2 (start-mats "pres.smi"))
    ;; send smil file to output component
     (A3 (send-message ?rc-id "http://myip/pres.smi")))
:spatial (
     (centerh A1)
     (centerv A1))
  )
)
```

Multiple Output Devices: Work, Public, Home

DynAMITE Topology



Demonstrator Architecture



Modelling an Animated Character

agent type	alc
param.	appearance

unimod.	gestures	lip movements	speech
param.	type, object	-	volume, complexity
syncWith	speech	speech	-
content	-	-	amodal
device	tv1.screen	tv1.screen	tv1.speakers