

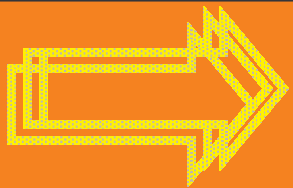


**Template-based Adaptive Video Documentaries**

**Cesare Rocchi & Massimo Zancanaro**  
**ITC-irst - Italy**

# **Template-based Adaptive Video Documentaries**

**Cesare Rocchi & Massimo Zancanaro**  
**ITC-irst**



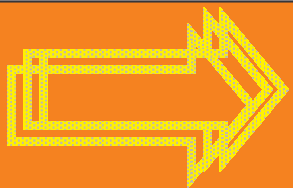
# Outline

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1. 2D video documentaries
  - What they are and why they are useful
2. XScript: XML for 2D Video documentaries
3. XAScript: making it adaptive
4. Rhetorical Patterns for authorings

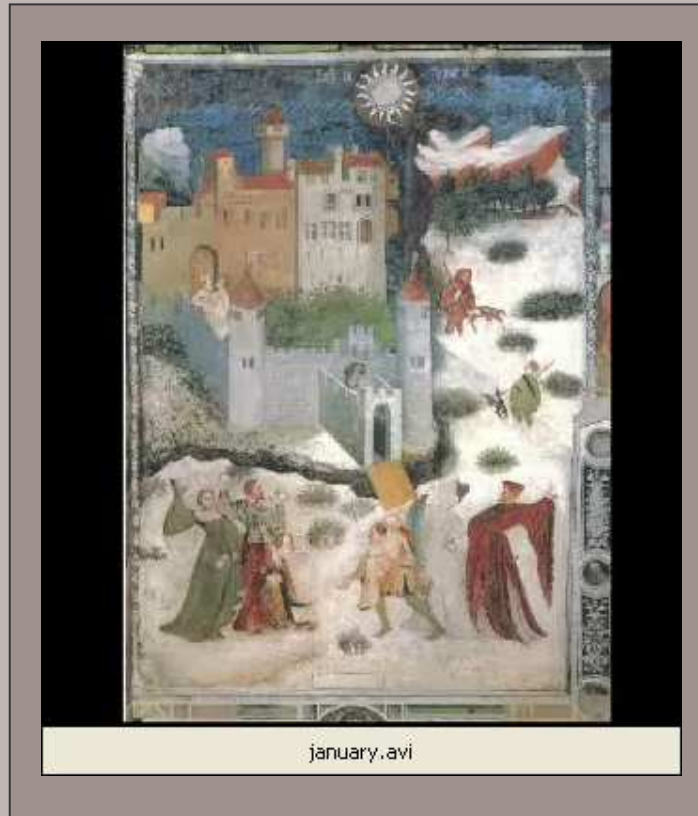
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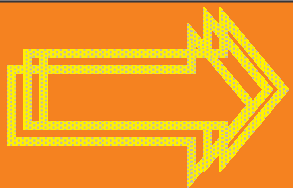
# A 2D Video Documentary

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A Video Documentary is made of a sequence of shots, built by applying camera movements to still 2D images, synchronized with an audio commentary.

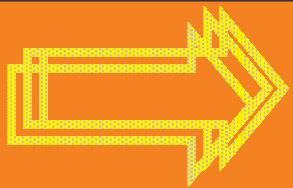
Shots' transitions represents the “punctuation” of the documentary.



# Uses of transitions

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- Short and faded transitions are indicated for smooth changes
- A close sequence of cuts might be useful to enumerate similar items
- A cut usually is a tough transition and tends to break the flow of discourse
- A fade-in/out is more 'narrative' and less abrupt

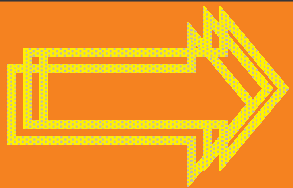


# Cinematic Language

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- Cinematic representation is not like natural language but it can be understood according to a general theory of signs and meaning that is based in Sussure's structuralist program.

*C. Metz. Film Language: a Semiotics of Cinema. 1974*



# Applying cinematic techniques

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- Constraints on camera movements:
  - Forbidden sequence of movements
- Rhetorical conventions
  - Applied to the rhetorical structure of the audio commentary



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Constraints on camera  
movements

# Rhetorical Conventions

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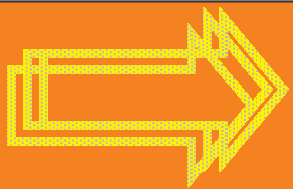
**Background**

[...] At the bottom on the right is a blacksmith's workshop, a plebeian anthesis to the tournament going on in the upper part of the painting which is chiefly an aristocratic activity.

The choice of a tournament for the month of February is related to the jousts and revelries that took place in carnival.



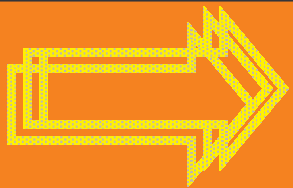
Two different shots linked by a long fade



# The effects of 2D documentaries on PDA

- A mobile museum guide
  - Location-aware
  - Torre Aquila, Castello del Buonconsiglio, Trento
- 60 subjects, 2 conditions, between-subjects
  - Cinematic and slide-show
- Cinematic is less stressful
  - The same fixation time
  - Less eye shifts between PDA and the environment

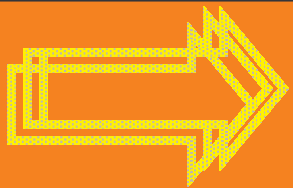
Alfaro I., Nardon M., Pianesi P., Stock O., Zancanaro M.  
Using Cinematic Techniques on Mobile Devices for  
Cultural Tourism. In *Information Technology &  
Tourism*, to appear.



# XScript

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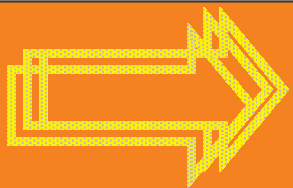
- A formalism to represent the logical structure of a 2D Video Documentary
- Macromedia Flash player on PDAs
  - It can be easily mapped on SMIL2+SVG



# XScript: top-level

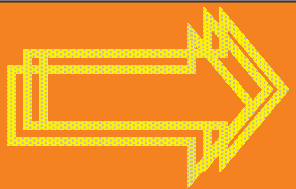
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```
<movie id="january">  
  <shots>  
    ...  
  </shots>  
  <editing>  
    ...  
  </editing>  
</movie>
```



# XScript: shots

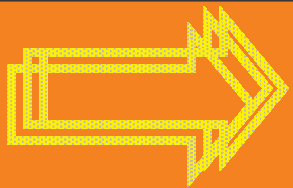
```
<shots>
  <shot id="shot605" image="det01">
    <video-track>
      <pause duration="1"/>
      <zoom duration="4" scale="1.5"/>
      <pause duration="2"/>
    </video-track>
    <audio-track>
      <audio-pause duration="3"/>
      <play audio="snowball-fight.mp3"/>
      <audio-pause duration="1"/>
    </audio-track>
  </shot>
  ...
```



# Xscript: transitions

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```
<editing>  
  <display shot="shot603"/>  
  <cross-fade shot="shot605" duration="1"/>  
</editing>
```



# XAScript: making it adaptive

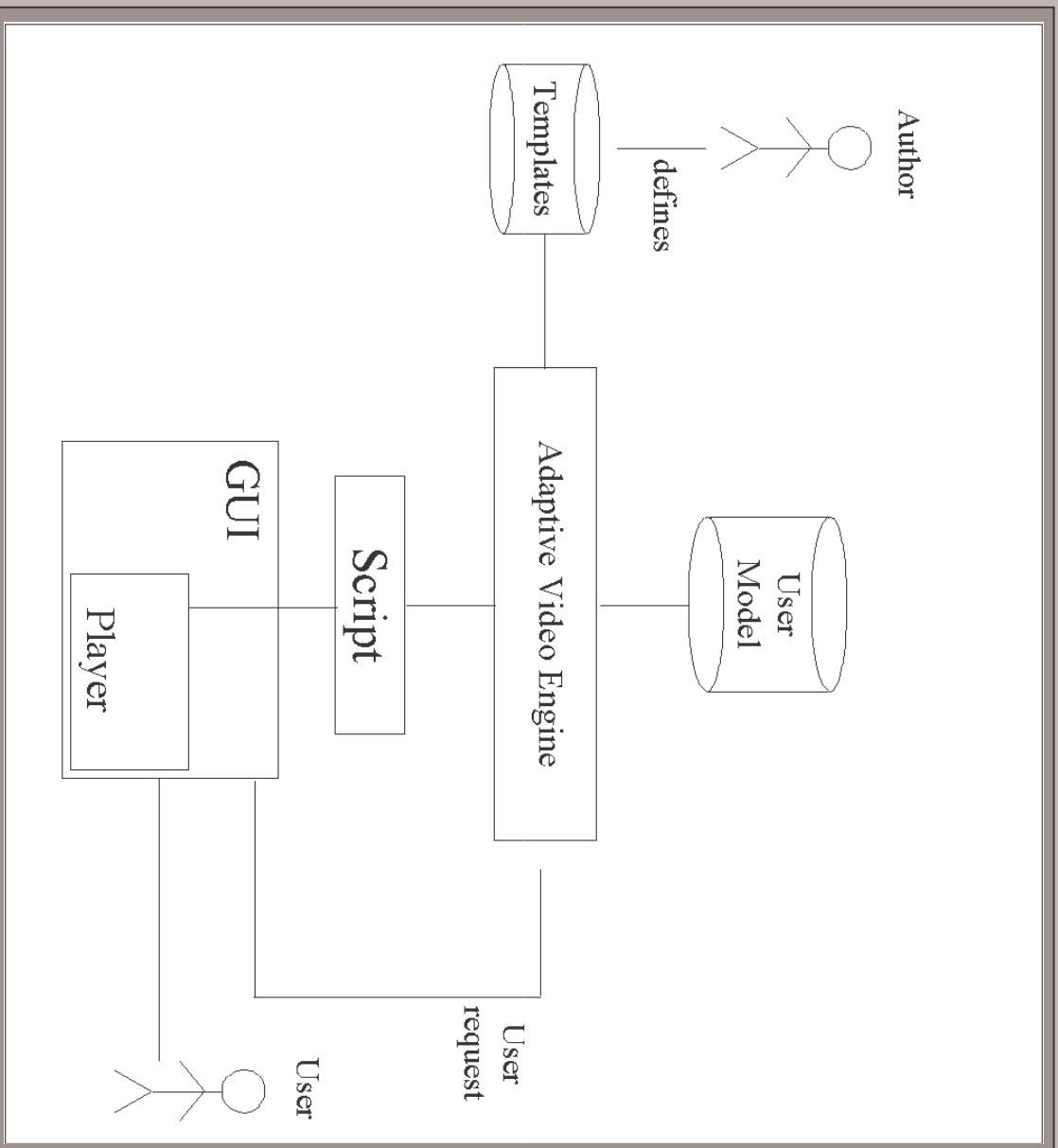
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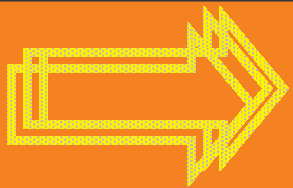
- A language for the definition of templates
  - intensional descriptions of a set of potential documentaries
  - with multiple-choice points on user-dependent parameters
  - Based on XScript
- An adaptation rule is a <condition, action> pair, where the condition tests the requirements and the action composes the pieces of the documentary

# Basic Architecture

## Template-based Adaptive Video Documentaries

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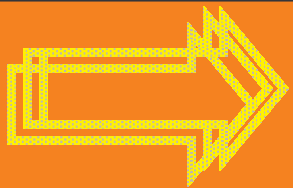




# Adaptation Rules

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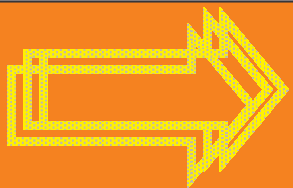
- A rule is a <condition-action> structure
- Grouping by logical operators <and> and <or>
- Rules can be applied in the editing part only
  - Define as many shots as you want ...
  - ... join the most appropriate ones ...
  - ... by applying the most appropriate transitions!



# Adaptation to the UM

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```
<rule>  
  <UM-expression>  
    $user.hasSeen('shot01')  
  </UM-expression>  
  <fade-in shot="shot02" duration="2"/>  
  <display shot="shot03"/>  
</rule>
```



# Adaptation to the context

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```
<rule>
```

```
  <EDIT-expression>
```

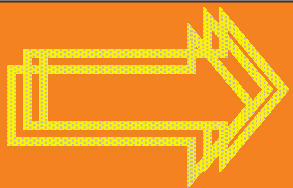
```
    $user.getLastTransition() == "fade-in"
```

```
  </EDIT-expression>
```

```
  <display shot="sh02"/>
```

```
  <fade-in shot="shot603" duration
```

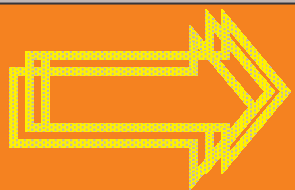
```
</rule>
```



# Supported features

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- **Spatial position:** the current position of the visitor and the history of her movements;
- **Interests:** a model of user's interest with respect to the items and the topics of the domain;
- **Discourse History:** a model of what the visitor has already seen and heard;
- **Background knowledge:** information about user's previous knowledge about the subject of the visit;
- **Device:** the device the visitor is using (PDA, Desktop PC);
- **Skills:** information about user's skills with technological tools and hypermedia interfaces;
- **Visiting style:** observations and inferences about the browsing style of the user;
- **Expertise:** the user is a novice, an expert, a child.
- **Dependencies among content units:** e.g. the selection of a shot requires another shot to be selected;
- **Dependencies among presentation forms:** e.g. the selection of a fade requires the precedent effect to be not a cut.

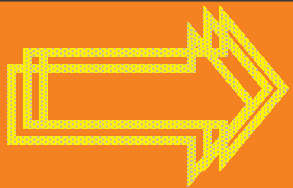


# An application

- A mobile museum guide
  - Location-aware
  - Torre Aquila, Castello del Buonconsiglio, Trento
- Integrates life-like characters and adaptive video composition



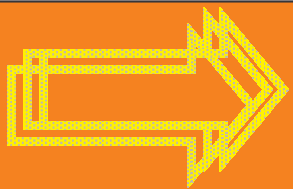
Rocchi C., Stock O., Zancanaro M., Kruppa M., and Krüger A. The Museum Visit: Generating Seamless Personalized Presentations on Multiple Devices. In Proceedings of Intelligent User Interfaces 2004. Madeira, January 2004.



# Authoring of documentaries

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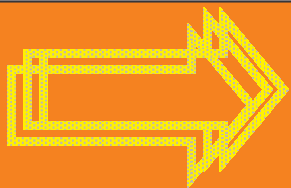
- Graphical interfaces help but
  - do not help focusing the adaptation strategies
  - authors are distracted by low-level issues
- An interesting approach is relying on the notion of pattern



# Patterns for adaptivity

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- During the writing of templates for adaptive presentations, designers have to face recurrent problems
  - Eg. Comparisons maximize the extent to which a visitor's understanding of an exhibit coheres with her other knowledge, and help to prevent the hearer from forming misconceptions. How to refer to previously mentioned material  $m$ , related to the current topic?

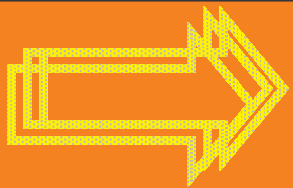


# Rhetorical Patterns

<b>Name:</b>	Suggestion
<b>Problem:</b>	Lead the user to visit an exhibit.
<b>Conditions:</b>	<ol style="list-style-type: none"> <li>1. The current exhibit <math>e</math> is related to another one <math>o</math> (e.g. they share the same style, they depict the same scene)</li> <li>2. The user has not visited <math>o</math>.</li> </ol>
<b>Motivation(s):</b>	The user is explicitly told (via audio or video) to go visiting $o$ . This helps her to understand similarities and/or differences between the two exhibits and contextualize her information absorption.
<b>Solution:</b>	At the end of the video presenting $e$ , insert a shot which represents $e$ and an audio file which points the user to $o$ . If needed insert also spatial references to help the visitor finding $o$ location.
<b>Related Patterns:</b>	Comparison. If condition 2 does not hold maybe a comparison applies.

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# Further work

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- A repository of patterns for presenting information
- A graphical authoring tool which supports patterns