Authoring Multimedia in the CMIF environment

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ABSTRACT

We present the user interface to the CMIF authoring environment for constructing and playing multimedia presentations. Within the environment an author constructs a presentation in terms of its structure and additional synchronization constraints, from which the actual timing information is derived.

The CMIF authoring environment presents three main views of a multimedia presentation: a *hierarchy view* for manipulating and viewing a presentation's hierarchical structure; a *channel view* for managing logical resources and specifying and viewing precise timing constraints; and a *player* for playing the presentation.

KEYWORDS: multimedia authoring, hypermedia authoring, composition, synchronization

INTRODUCTION

Creating multimedia presentations can be a complex and time-consuming process. We believe that a key to reducing the authoring burden is the use of structure-based authoring tools. These allow the explicit manipulation of the structure of a presentation rather than the implicit manipulation of this structure via, for example, a time-line. The CMIF authoring environment was designed to support the composition of CMIF-based multimedia presentations from existing media items. CMIF (CWI Multimedia Interchange Format) [1] is a system-independent representation of multimedia documents. We present the three different views of a multimedia presentation supported in the CMIF environment.

Since the authors are based in Amsterdam, we invite attendees of InterCHI '93 to contact us for a visit and demo during the conference. A full version of this paper [3] has been submitted to the Multimedia '93 conference. A description of the architecture and implementation of the CMIF environment is given in [5].

A STRUCTURED APPROACH TO MULTIMEDIA AUTHORING

Paradigms such as scripts and timelines [6] are often supported for authoring multimedia presentations, however, these do not capitalize on the inherent modularity in the structure of a presentation. This leads to fragmentation of the authoring process and unnecessary work when re-using or updating parts of the presentation.

We advocate an explicitly structure-based approach for authoring multimedia, where an author is relieved of the tedium of defining time-constraints explicitly, and instead creates a "scenario-based" structure from which timing constraints are derived.

EXAMPLE

Figure 1 shows a "typical" multimedia presentation, a clip from a walking tour of Amsterdam, which we will refer to throughout this paper. The presentation is formed from a collection of media items displayed on the screen, in this case an image and some text items. A spoken commentary, in either Dutch or English, is given and the subtitles change in time with the spoken words. The boxed text items are linked to other parts of the multimedia presentation.

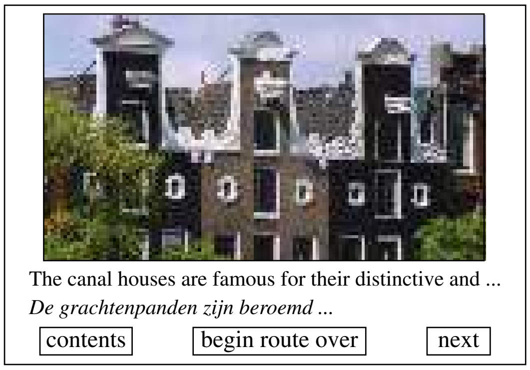

Figure 1 The gables clip from a walking route in Amsterdam

THE CMIF AUTHORING ENVIRONMENT

The CMIF authoring environment separates out different tasks of the authoring process and presents the corresponding information in three separate, but connected, views. The *hierarchy view* allows the author to define the structural relations between the media items making up the presentation. This structure is used to derive basic timing information which is displayed in the *channel view*. The channel view shows the resource usage of the media items composing the presentation, and allows precise synchronization relations to be specified. The *player* is used to preview the presentation.

Hierarchy View

The hierarchy view, figure 2, is the primary authoring view, allowing the author to create multimedia presentations using a top-down or bottom-up approach. The hierarchically structured nodes of the presentation are represented as nested boxes, where children of a node are played either sequentially or in parallel. The function of this view is similar to the editing tool described in [4].

Authoring is carried out by creating parallel and

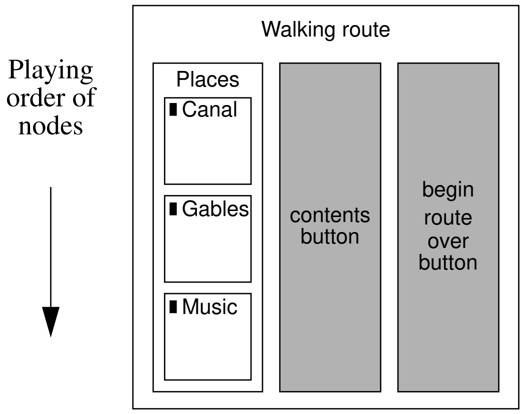

Figure 2 **Hierarchy view for the *Walking route* sequence.** *Places*, *contents...* and *begin...* are played in parallel. *Canal*, *Gables* and *Music* are played one after the other. A small dark box indicates hidden sub-structure.

sequential structures (composite nodes) and assigning media items as the leaf nodes of this structure. Media items assigned at higher levels of the structure are displayed for the duration of the structure in which they are defined, e.g. the *contents...* and *begin...* items in figures 1, 2 and 3.

Channel view

The channel view, figure 3, shows the logical resource usage of a presentation, including timing relations derived from the structure defined in the hierarchy view. More complex timing constraints can be specified using synchronization arcs (the arrows in the figure). The media items making up the presentation are shown in the channel view with their precise durations and timing relationships.

A channel enables the author to define high-level presentation characteristics for each media type, so that presentations can be composed without having to specify details for each item: for example, a text channel defines a rectangular area on the screen and a font. Attribute values assigned to a channel can be overridden by individual items.

Player

The player allows the author to play a selection from the hierarchy or channel view, without having to go through a complete sequence. The author or end user can turn channels on and off, for example allowing the selection of alternative languages, e.g. UK and NL in figure 3.

CONCLUSION

We provide separate views of a multimedia presentation in order to support the different tasks the author needs to carry out. We present a modular method of creating multimedia documents by making the structure of the document explicit, and allowing the author to manipulate this structure, hence the author is relieved of defining timing information for items on an individual basis. Through the use of channels the author is able to define global presentation characteristics.

ACKNOWLEDGEMENTS

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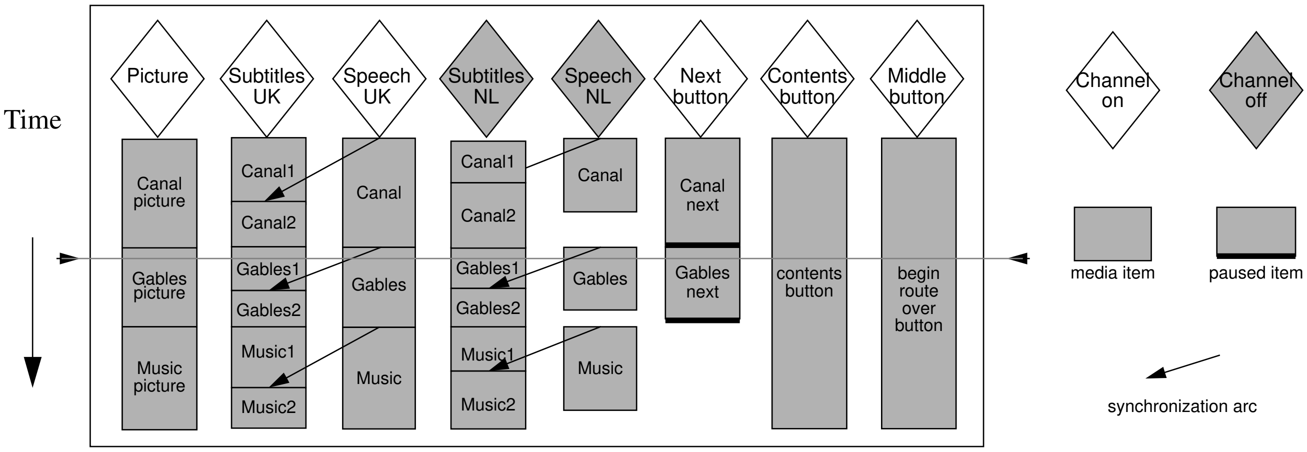

Figure 3 **Channel View for the *Walking route* sequence.** The diamonds at the top of the figure show the channel names. The media items assigned to the channels are represented as boxes beneath the diamonds. The height of a box represents its duration. The media items intersecting with the dotted, horizontal line correspond to the clip shown in figure 1.