CMIFed: A Transportable Hypermedia Authoring System

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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 [1], [2]. 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 system supports the composition of hypermedia presentations from existing media data objects. CMIF (CWI Multimedia Interchange Format) is a system-independent representation for hypermedia presentations; CMIFed (CMIF editor) is the main tool for creating CMIF presentations [3].

CMIF presentations can contain text, images, video and audio. These are referred to as (media) data objects. The data objects are generally kept in separate files, which may use a number of standard formats (e.g. GIF, TIFF and JPEG images are all acceptable). The author can impose structure by placing data objects in a tree. Rough synchronization (presenting data objects in parallel) is obtained by marking a tree node as parallel. Fine synchronization (the specification of precise delays) can be added in the form of specific synchronization constraints.

Interactivity is added to a presentation by creating hyperlinks, which can be attached to stretches of text or areas of images. The author has considerable freedom in the effect of activating a hyperlink — it may replace all or part of the current context or initiate an activity in a different context (a context can be thought of as part of the screen [4]). It is also possible to run external programs or scripts.

CMIF defines (logical) "channels" to capture the essence of resources — a channel represents a particular screen area or another resource such as an audio channel. A media data object must be bound to a channel in order to be displayed or otherwise presented to the end user. The channel specifies default values for a variety of media-specific attributes such as fonts and colors. Thus, when a presentation style is changed in a channel, this change is propagated throughout the whole presentation.

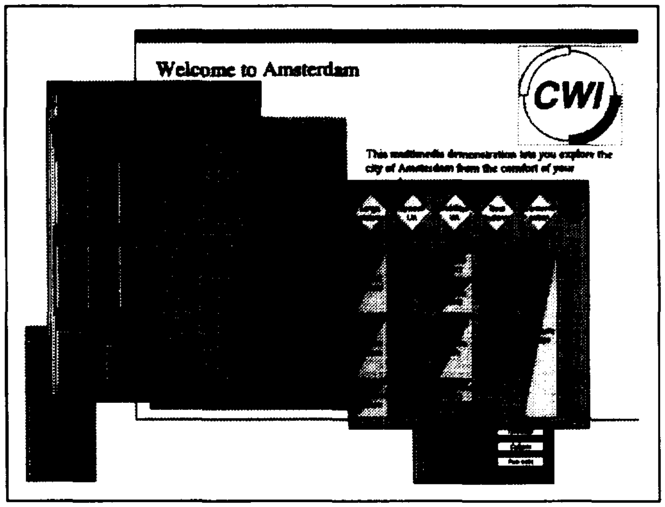
Channels form the key to the transportability of presentations created with CMIFed — essentially, when a presentation has to be mapped to a new environment, only the channels have to be mapped, not all individual media data objects.

In the video we show the basics of structure editing using the two main editing views of CMIFed: the Hierarchy View and the Channel View. The third main view, the Player, is also shown.

THE HIERARCHY VIEW

The Hierarchy View (on the left in the figure below) 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.

Authoring is carried out by creating parallel and sequential structures (composite nodes — displayed in gray) and assigning media data objects as the leaf nodes of this structure (displayed in orange). Although the size of the boxes bears no relation to their duration, time flows from top to bottom — nodes played sequentially are displayed one above the other, while nodes played in parallel are displayed next to each other. Independent contexts (displayed in blue) can be placed anywhere in the tree — their position determines when they are active.


Welcome to Amsterdam

This multimedia demonstration lets you explore the city of Amsterdam from the comfort of your

A typical view of the CMIFed environment, showing the hierarchy view and the channel view, with the presentation and control panels in the background.

THE CHANNEL VIEW

The Channel View (bottom right in the figure) shows the logical resource usage of a presentation, including timing relations derived from the structure defined in the Hierarchy View. The media data objects making up the presentation are shown in the Channel View with their precise durations and timing relationships. More complex timing constraints can be specified using synchronization arcs (the arrows in the figure).

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 object: 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 media data objects.

THE PLAYER

The Player is used to play the finished presentation or to preview it while authoring. (A separate playing program, without editing facilities, is also available.) The author or end user can turn channels on and off, for example allowing the selection of alternative languages.

The Player also allows the author to preview a selection from the Hierarchy or Channel View without having to go through a complete sequence. Finally, the Player can be used to rearrange the lay-out of channels on the screen.

REFERENCES

[1] Structured Multimedia Authoring, by Lynda Hardman, Guido van Rossum and Dick C A Bulterman (ACM Multimedia '93, Anaheim, Aug '93, 283 - 289)

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[3] CMIFed: A Presentation Environment for Portable Hypermedia Documents, by Guido van Rossum, Jack Jansen, K.Sjoerd Mullender and Dick C.A. Bulterman (ACM Multimedia '93, Anaheim, Aug '93, 183 - 188)

[4] Links in Hypermedia: the Requirement for Context, by Lynda Hardman, Dick C.A. Bulterman and Guido van Rossum (ACM Hypertext '93, Seattle WA, Nov '93, 183-191)