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Title: **MPEG-7 Requirements to Highlight and Order Description items**
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1 Introduction

This document proposes some additional requirements to the MPEG-7 Requirements Document [2]. We think that some very important MPEG-7 requirements should deal with the concepts of (1) highlighting description items (e.g. images, sounds, events, objects etc.) which are most relevant to characterize a multimedia document and (2) of information ordering. In other words, due to a possible high amount of description items, an entity who will create descriptions of multimedia (MM) documents, according to MPEG-7 standard specifications (i.e. a **description provider**), shall highlight the items most representative for the kind of document being described in order to facilitate user needs (such as queries, navigation etc.). Besides, we consider the need of providing users with ordering mechanisms a very relevant issue to MPEG-7. Such ordering mechanisms can be derived by combining descriptor values (e.g., a set of key – frames ordered on the basis a color descriptor or a set of sounds ordered by means of their loudness descriptor). However the possible large variety of descriptors forming a description could consequently lead to a high number of ordering criteria for every description item of a subset of these items. Therefore we propose that the description provider should also highlight a reduced set of descriptors allowing to order some elements (e.g., key frames, events etc.) of a certain description in a proper manner for the MM document being described.

The document is organized as follows: we explain the motivation behind our proposals in Section2 and we present the new requirements in Section 3.

2 Motivation

By reviewing the MPEG-7 Requirements Document [1],[2], it can be noticed that there are no mechanisms for limiting the size and the level of details of descriptions. For instance, e.g. by referring to MPEG-7 Generic DS [3], there can be descriptions with an arbitrarily high number

of key-frames, mosaics, events, objects etc. which may create some difficulties to be efficiently exploited by users. However it does not seem sensible to propose a limitation in the size of the description since a high level of details could be useful in some cases. We believe that such a problem could be overcome by introducing a requirement stating to highlight the description items most relevant to a particular document. In this way, users can be facilitated in their queries by knowing, e.g., the relevant topics of the documents being described and at the same time they could have all the necessary level of details.[1] The kinds of highlighted items (i.e. **key-items**) could vary according to the category of document being described and the purpose for which the description has been created (i.e. application context) For instance, in a documentary about flowers the key items can be images of the flower being presented.

The concept of key-items for MM documents can be seen as a generalization of the concept of key-words for text documents. As in a book or a scientific paper, key-words are selected by the editor and/or the author (rarely by the readers), similarly the MM documents key-items can be highlighted by a description provider in a suitable way for the category of the described document.

Another issue deals with the ordering mechanisms applied to key-items (but possibly to other elements of the description). It is easy to understand that a suitable ordering of items can help user queries and that the ordering can be based on the values of several descriptors (e.g. color histogram, shape descriptors, audio loudness etc.). However in an MPEG-7 description, there can be many kinds of Ds and therefore an extreme large set of possible ordering criteria can be considered also depending on the key-items to order. Hence we believe that in this case as well it is responsibility of a description provider to suggest a possible set of **ordering keys** (i.e. Ds to be combined to create an order of the key-items).

The proposed requirement of having an ordering functionality for key-items is necessary for generic multimedia data, as this ordering may not be purely alphabetical. To facilitate any selection process (especially when interactive) we also think that in this case, the description provider should propose the most useful ordering-keys given a certain application context. It does not mean which mathematical criteria are involved in combining descriptor values to reach the final ordering. This remains a non-normative issue. Besides, it must be pointed out that we are not proposing here to standardize all the possible ordering ways for every application context, since this number could be very large. We are only proposing that the description provider shall indicate some ordering keys suitable for a certain MM document.

3 Requirements

By referring to the Requirements Document V.9 [2], we propose to add the following requirements.[2]

To Section 4.2 – REQUIREMENTS ON DESCRIPTION SCHEMES

[1] Obviously a linking mechanism is necessary. By the way, this linking functionality is already foreseen by the actual requirement document.

[2] By referring to the Requirements Document V.8 [1], these requirements must be put in the General Requirements (Section 4.1.1).

7. Key items

Definition:
Description Schemes shall support mechanisms such that the most relevant items, according to the kind of MM document being described, are highlighted in order to facilitate user queries.

Example:
To enhance the description of the video documents, there can be the concept of a key-image. In context of broadcast news programme, these key-images can be linked to all key-frames (or mosaics) associated to shots dealing with a foreign affairs reportage, another one linked to key frames (or mosaics) associated to shots dealing with all sport reportages etc. (see Figure 1).

8. Ordering Keys

Definition:
Description Schemes shall support mechanisms such that it is possible to mark the descriptors most relevant for ordering subsets of description information of a certain type (such as key-items) in a MM document, in order to facilitate user queries.

Example:
A set of key-frames of a violent movie being ordered according to the level of underlying audio loudness.

4 Summary

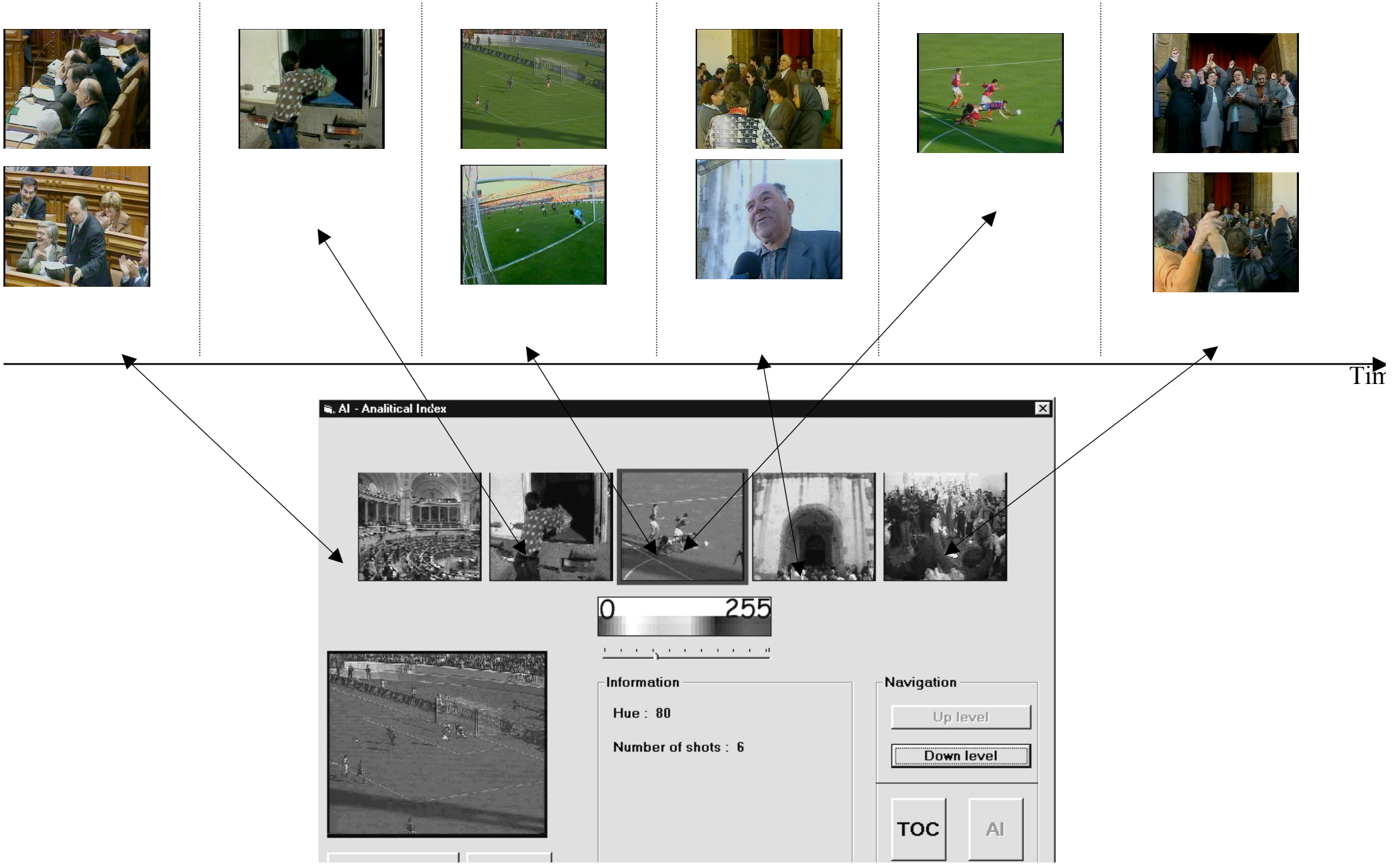
In this document, we have presented some open issues linked with the current MPEG-7 Requirements Document: arbitrarily high number of description items and ordering criteria. Therefore we have proposed two new requirements for the DSs. The former stating to highlight the most relevant description items (descriptor values) in a MM document. The latter stating to highlight the more relevant ordering mechanism (descriptors) for the kind MM documents being described and given a certain list of items that it would appropriate to order. The aim of the aforementioned requirements is to facilitate user queries.

5 References

[1] AHG on MPEG-7 Requirements, “MPEG-7 Requirements Document V.8”, ISO/IEC JTC1/SC29/WG11 MPEG99/N2727 MPEG document, Seoul, Korea, March 1999.

[2] AHG on MPEG-7 Requirements, “MPEG-7 Requirements Document V.9”, Proposal to ISO/IEC JTC1/SC29/WG11 MPEG99/M4650, Vancouver, Canada, July 1999.

[3] Video Group, “Generic Visual Description Scheme for MPEG-7”, ISO/IEC JTC1/SC29/WG11 MPEG99/N2694, Seoul, Korea, March 1999.


Tim
AI - Analitical Index
0
255
Information
Hue : 80
Number of shots : 6
Navigation
Up level
Down level
TOC
AI