



# MPEG-7 Standard for Multimedia Databases

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## ABSTRACT

The Moving Picture Experts Group (MPEG) is developing a new standard called the “Multimedia Content Description Interface,” also known as MPEG-7. The goal of MPEG-7 is to enable fast and effective searching and filtering of multimedia content. The effort is being driven by requirements taken from a large number of applications related to multimedia databases, interactive media services (music, TV programs), video libraries, and so forth. MPEG-7 is achieving this goal by developing an XML-Schema based standard for describing features of multimedia content. In this tutorial, we study the emerging MPEG-7 standard and describe the new challenges for MPEG-7 multimedia databases.

## Keywords

Multimedia databases, MPEG-7, digital libraries, content-based retrieval, indexing, similarity search.

## 1. MPEG-7 MULTIMEDIA DATABASES

With the tremendous growth in multimedia information, it is becoming increasingly important to effectively store, search, and retrieve such information. Recent advances in multimedia databases have resulted in technologies for managing a variety of multimedia formats, including images, video, audio, and text. In particular, advances in content-based retrieval have enabled querying of multimedia based on features such as color, texture, shape, motion, audio energy, and so on. MPEG-7 promises to enable interoperable content-based querying of the semantic and structural content of the multimedia information, as well as interoperable similarity searching of perceptual features.

MPEG-7 is standardizing XML metadata structures called Descriptors and Description Schemes (DS), which are used to describe and annotate multimedia information [1, 2]. The MPEG-7 Descriptors and DSs provide a standardized way of describing multimedia concepts for the purpose of multimedia content description and content management. The

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ACM SIGMOD 2001 May 21-24, Santa Barbara, California, USA  
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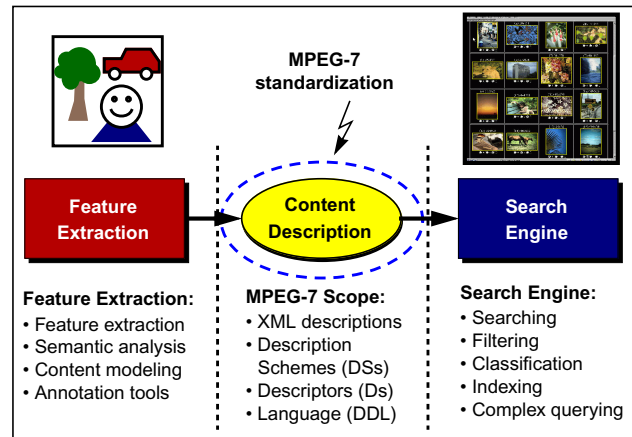


Figure 1: Scope of MPEG-7 Standard.

Descriptors and DSs are defined using the MPEG-7 Description Definition Language (DDL), which is based on the XML Schema Language. The resulting MPEG-7 descriptions can be expressed in a textual form (i.e., human readable XML for editing, searching, filtering), or in a compressed binary form (i.e., for storage, streaming, transmission).

A number of significant technical challenges remain for MPEG-7 multimedia databases. Since MPEG-7 standardizes only the metadata structures (Descriptors and DSs) and description language (DDL), many technologies still need to be developed around the MPEG-7 standard for extracting and searching, as shown in Figure 1. In particular, new methods are needed for analyzing and classifying multimedia content to automatically generate MPEG-7 descriptions at the semantic level. Lastly, new query methods are needed to support the complex MPEG-7 querying of multimedia databases, which involves similarity matching with fuzzy constraints across the different levels of multimedia content description, including features, structure, and semantics.

## 2. REFERENCES

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