MPEG-7, MPEG-21

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Purpose of MPEG 7, 21

- To build Multimedia Database Systems (MDBS)
- Enable interoperability between multimedia systems
- Warehouses for multimedia elements
- Stored images, video sequences, audio records, lyrics, ...
Multimedia Database Systems / 2

- Find and retrieve the data (Information retrieval)
- Description (Metadata)
- Indexing
- Protection
Basic idea

- MPEG-7: Describe the multimedia resources
- MPEG-21: Framework for transparent (interoperable) usage of multimedia resources in wide range of networks and devices
MPEG-7

- ISO/IEC 15938
- MPEG
- formally named “Multimedia Content Description Interface”
- Metadata
MPEG-7: types of information

- The form
- Conditions for accessing the material
- Classification
- Links to other relevant material
- The context
- Harmonisation on Dublin Core and others
MPEG-7: types of information example

- Video format: AVI, Video Codec: XviD, Resolution 512x304
- Free to use
- Documentary movie
- Movie from exhibition Prague GI Open 2004, Franta, Pepa, Kiosk, Audience, ...
MPEG-7: range of information / 1

- Creation and production processes of the content (director, title, ...)
- Usage of the content (copyright pointers, usage history, broadcast schedule)
- Storage features of the content (storage format, encoding)
MPEG-7: range of information / 2

- Information about **low level features** in the content (colors, textures, sound timbres, melody description)
- Conceptual information of the **reality captured** by the content (objects and events, interactions among objects)
- Information about how to **browse** the content in an efficient way
MPEG-7: range of information / 3

- Structural information on spatial, temporal or spatio-temporal **components** of the content (scene cuts, segmentation in regions, region motion tracking)
- Information about **collections** of objects
- Information about the **interaction** of the user with the content (user preferences, usage history)
<table>
<thead>
<tr>
<th>Feature</th>
<th>Video Segment</th>
<th>Still Region</th>
<th>Moving Region</th>
<th>Audio Segment</th>
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<tbody>
<tr>
<td>Time</td>
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<td>Camera motion</td>
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<td>Audio features</td>
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</tbody>
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MPEG-7: depth / 2
MPEG-7: depth / 3 segments
MPEG-7: depth / 4 partitions, decompositions
MPEG-7: depth / 6
Collections, Relationship
MPEG-7: depth / 7
Shapes
MPEG-7: depth / 8
Camera motions
MPEG-7: application’s areas

- Architecture, real estate, and interior design (e.g., searching for ideas)
- Digital libraries
- E-Commerce
- Multimedia directory services (e.g. yellow pages, Tourist information, Geographical information systems).
• Framework for access, delivery, management and protection processes
• E-Commerce
• MPEG-21 Multimedia Framework initiative
• Status: Working Draft
MPEG-21: Basics / 2

- Normative open framework
- Multimedia delivery and consumption
- For all the players in the delivery and consumption chain
- The MPEG-21 enabled open market
MPEG-21: Components

- User model (User)
- Digital Item
- Way of interaction
- Distribution and transaction
- Operations
MPEG-21: Parts / 1

- Vision, Technologies and Strategy
- Digital Item Declaration
- Digital Item Identification
- Intellectual Property Management and Protection (IPMP)
Digital item identification

MPEG-21 music album

Identifier:
- GRIid
- Descriptions:
  - Album Title
  - Label

Identifier:
- ISRC
- Descriptions:
  - Lead Singer
  - Orchestra
  - Conductor
  - Concert Hall
  - Engineer
  - Label

Identifier:
- ISMN
- Descriptions:
  - Title
  - Composer
  - Lyricist
  - Duration
  - Singer
MPEG-21: Parts / 2

- Rights Expression Language
- Rights Data Dictionary
- Digital Item Adaptation
- Reference Software
References

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  #MPEG-21