

Mediterranean Space of Technology and Innovation

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Multimedia standards: History - State of Art

Peter Stanchev

Professor at Kettering University, Michigan, USA

1. Why is this topic important?"

Standardization is important. It always has been. Even in ancient times, units of measure had to be established and held as the standard. No other technology than the MPEG and W3C standards has the potential to become as deeply developed and widely supported by multiple industries, vendors and service providers, and to be trusted by end users with their multimedia needs.

2. Why should one attend this tutorial?

The aim of this tutorial is to review some of the standards connected with multimedia and their metadata. Using and working with movies, video, animation, music, voice, web application everybody need to use and understood the multimedia standards. MPEG, which stands for Moving Picture Experts Group, is the name of a family of standards used for coding audiovisual information in a digital compressed format. The major advantage of MPEG compared to other formats is that MPEG files are much smaller for the same quality. W3C standards define an open Web Platform for application development that has the unprecedented potential to enable developers to build rich interactive experiences, powered by vast data stores that are available on any device. The tutorial will cover also open standards for interactive TV, audiovisual media, metadata standards, museum, archives, and libraries metadata.

3. What can the attendees learn from this tutorial?

The main standards for multimedia. Many demos will be provided.

4. Who should attend this tutorial?

Computer science Ph.D. students, researchers, people willing to work with multimedia and their metadata. Not special preliminarily knowledge is required.

5. What does the speaker plan to give in the tutorial?

1. MPEG (Moving Picture Experts Group - Multimedia Framework) family standards.

- MPEG-1, the standard for such products as Video CD and MP3 are based;
- MPEG-2, the standard for such products as Digital Television set top boxes and DVD are based;
- MPEG-4, the standard for multimedia for the fixed and mobile web;
- MPEG-7, the standard for description and search of audio and visual content;
- MPEG-21, the Multimedia Framework;
- MPEG-C, a collection of Video specific standards;
- MPEG-D, a collection of Audio specific standards;
- MPEG-DASH, the standard for video streaming over the internet;
- MPEG-E, a standard (M3W) providing support to download and execution of multimedia applications;
- MPEG-H, a standard (HEVC) that will provide significantly increased video compression performance compared to AVC;
- MPEG-M, a standard (MXM) for packaging and reusability of MPEG technologies;
- MPEG-U, a standard for rich-media user interface;
- MPEG-V, a standard for interchange with virtual worlds.
- Reconfigurable Video Coding (RVC) standard

2. W3C Standards

- Web Design and Applications involve the standards for building and rendering Web pages, including HTML5, CSS, SVG, Ajax, and other technologies for Web Applications;
 - Web Architecture focuses on the foundation technologies and principles which sustain the Web, including URIs and HTTP;
 - Semantic Web technologies enable people to create data stores on the Web, build vocabularies, and write rules for handling data. Linked data are empowered by technologies such as RDF, SPARQL, OWL, and SKOS;
 - XML Technologies including XML, XQuery, XML Schema, XSLT, XSL-FO, Efficient XML Interchange (EXI), and other related standards;
 - Web of Services refers to message-based design frequently found on the Web and in enterprise software. The Web of Services is based on technologies such as HTTP, XML, SOAP, WSDL, SPARQL, and others;
 - Web of devices. This includes Web access from mobile phones and other mobile devices as well as use of Web technology in consumer electronics, printers, interactive television, and even automobiles;
 - Browsing and authoring tools. Web agents are intended to serve users.
3. Open standards for interactive TV (ITV). MHEG (Multimedia and Hypermedia Information Coding Expert Group), DAVIC (Digital Audio-Video Council), Java TV (an extension of the Java platform), MHP (Multimedia Home Platform), GEM (Globally Executable Multimedia Home Platform), OCAP (OpenCable Application Platform), ACAP (Advanced Common Application Platform).
 4. Standards in the audiovisual media. DPX (Digital Picture Exchange), MXF (Material Exchange Format), Engineers (SMPTE), DCP (Digital Cinema Package), Dublin Core, EBU P Meta
 5. Metadata standards: Dublin Core, TEI (Text Encoding Initiative), METS (Metadata Encoding & Transmission Standard), MODS (Metadata Object Description Schema), EAD (Encoded Archival Description), LOM (Learning Object Metadata) standard, MARC Standards, VRA Core Categories, CSDGM (Content Standard for Digital Geospatial Metadata)
 6. Standards for museum metadata: Categories for the Description of Works of Art (CDWA), Museumdat, Object ID, SPECTRUM, Light Information Describing Objects (LIDO), FDAGuide
 7. Standards for archives: General International Standard Archival Description: ISAD(G), Describing Archives: A Content Standard (DACS), Encoded Archival Description – EAD, Reference Model for an Open Archival Information System – OAIS
 8. Standards for libraries: Standard Functional Requirements for Bibliographic Records – FRBR, MAB2, MARC 21 (MARC), Standard Metadata Encoding & Transmission Standard – METS, MODS, MIDAS

Keywords: Multimedia Standards, MPEG, W3C, Interactive TV, Video-Stream Filtering, Audiovisual Media, Metadata

Biography: Peter Stanchev is currently professor at Kettering University, Flint, Michigan, USA and professor and chair at the Institute of Mathematics and Informatics, Bulgarian Academy of Sciences, Sofia, Bulgaria. He publish 2 books, more than 200 chapters in monographs, journal and conference peer-reviewed papers, more than 200 conference papers and seminars, and have more than 600 citations. His research interests are in the field of multimedia systems, database systems, multimedia semantics, and medical systems. Serving also on many database and multimedia conference program committees, he is currently editor of chief and on the editorial boards of several journals. He has presented similar tutorial on several conferences.