

Multimedia Encryption, Transmission and Authentication

Edited by

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Chapter 2

VIDEO CODING: MPEG STANDARDS

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2.1. INTRODUCTION

Moving Picture Coding Experts Group (MPEG) refers to a whole family of international standards for compression of audio-visual digital data. The most well known are MPEG series which are also formally known as ISO/IEC-13818 and ISO/IEC-14496 [ISO/IEC, 2007]. The most important aspects are summarized as follows:

The MPEG-1 standard was published 1992 with aim of providing VHS quality through a bandwidth of 1.5 Mb/s, which allowed to play a video in real time from a CD-ROM. The frame rate in MPEG -1 is locked at 25(PAL) fps and 30(NTSC) fps respectively. Furthermore, MPEG-1 was designed to allow a fast forward and backward search and synchronization of audio and video. A stable behavior, in cases of data loss, as well as allow computation times for encoding and decoding was reached, which is important for symmetric applications, like video telephony.

In 1994 MPEG-2 was released, which allowed a higher quality with a slightly higher bandwidth. MPEG-2 is compatible to MPEG-1. Later it was also used for High Definition Television and DVD, which made the MPEG-3 standard disappear completely. The frame rate is locked at 25 (PAL) fps and respectively, just as in MPEG-1. MPEG-2 is more scalable than MPEG-1 and is able to play the same video in different resolutions and frame rates.

MPEG-4 was released in 1998. This standard provides lower bit rates (10Kb/s to 1Mb/s) with a good quality. It was a major development from MPEG-2 and designed for the use in interactive environments, such as multimedia applications and video communication. It enhances the MPEG family with tools to lower the bit-rate individually for certain applications [2]. Therefore, the MPEG standard is more adaptive to the area of lower video usage. For multimedia producers, MPEG-4 offers a better content reusability as well as a copyright protection.