Seminar: Multimedia Coding and Transmission

Multimedia Coding and Transmission

Ifi, UiO, INF5080

Norsk Regnesentral

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Wolfgang Leister

This course ...

- ... is held at Ifi, UiO ...

  Wolfgang Leister

- … contains contributions by

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Course Information

- Web page:
- http://www.uio.no/studier/emner/matnat/ifi/INF5080/
- Handouts will be available on web pages soon after lecture
- Literature list

Topics

(1) Intro + Information Theory
(2) Image Coding (Colour, JPEG, DCT)
(3) Video Coding (MPEG 1+2)
(4) Audio Coding (MP3)
(5) Speech Coding
(6) Wavelet Coding (JPEG 2000)
(7) MPEG 4, MPEG 7

(8) Digital TV, MHP, DAB
(9) DICOM, JPEG-LS
(10) H.263, DivX, Ogg Vorbis, ...
(11) Transmission and protocols, RTP
(12) MIDI
(13) Applications ...
(14) Historic Music Coding

The OBLIG

- The course INF5080 has an OBLIG
- Each student presents a topic in a short lecture (ca. 15-20 minutes).
- The topic of the OBLIG-lecture must be related to INF5080.

OBLIG – topic examples

- MPEG 7, MPEG 21, JPEG-LS, ...
- DICOM, coding/transmission in medical applications, ...
- audio codecs flax, speex, vorbis (ogg)
- video codecs, theora, Windows Media, …
- applications … standards … codecs …
- Watermarking, DRM (digital rights management)

Literature

- Joan L. Mitchell, William B. Pennebaker, Chad E. Fogg, and Didier J. LeGall: "MPEG Video Compression Standard", Chapman&Hill, ISBN 0-412-08771-5, 1996
- Ming-Ting Sun, and Amy R. Reibman:"Compressed Video over Networks", Marcel Dekker, ISBN 0-8247-9423-0, 2001
- Wolfgang Leister, Svetlana Boudko, Ole Aamodt, Peter Holmes: "Digital TV - a survey", NR Report 988, 2002. http://publications.nr.no/digitv.pdf

Literature

- eliens@cs.vu.nl: "A (not so) gentle introduction to multimedia 2001, http://hush.cs.vu.nl/media/
- Peter A. Henning: Taschenbuch Multimedia, Fachbuchverlag Leipzig, 2.ed, 2001.

Pensum

- Selected chapters from literature list
- Content from handouts,
- including oblig presentations
- ...

Standards, Standard Proposals

ATSC (Advanced Televsion Systems Committee)
IEC
H.261, H.263
HyTime
Interactive Multimedia Association (IMA)
Internet (RFCs, drafts, standards, IETF)
IMA RFTs (Interactive Multimedia Association)
MHEG

MIME
National Multimedia Association of America (NMAA)
OMF
PREMO
RTF
SGML
MPC Level 3
MPEG 1
MPEG 2
MPEG 4
MPEG 7
MPEG 21
SMIL
VRML

+ many proprietary standards

MPEG History

- MPEG-1: video and audio (1992)
- MPEG-2: Digital TV and DVD (1994)
- MPEG-3: HDTV (withdrawn)
- MPEG-4: Multimedia applications (1998)
- MPEG-7: MM search and filtering (2001)
- MPEG-21: Multimedia framework

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MPEG-1 • ISO 11172

- Part 1: Systems
- Part 2: Video
- Part 3: Audio (Layer I, II, III)
- Part 4: Conformance
- Part 5: Software Simulation

MPEG-2 • ISO 13818

- Parts 1-5 as in MPEG-1
- Part 6: DSM-CC (Digital Storage Medium Command and Control)
- Part 7: NBC (Non-Backwards Compatible Audio)
- Part 8: 10-bit video extension (withdrawn)
- Part 9: RTI (Real-time interface betw. set-top box and head end server)

MPEG

Which parts of MPEG 2 are of interest for this course?
- Part 2: Video
- Part 3: Audio (Layer I, II, III)
- Part 1: Systems
- Part 6: DSM-CC

MP3

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MPEG-1
Audio Layer 3

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The End of Part 1