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Highly successful evaluation promises bright future for new multimedia description standard MPEG-7

First MPEG-4 Internet camera; work on studio quality started

Seoul, Korea, 19 March 1999 - Development of the MPEG-7 Standard has started at the 47th MPEG meeting held in Seoul, South Korea from 15-19 March. The Call for Proposals for MPEG-7 technology, issued in October '98, resulted in a total of 392 submissions from 59 different companies, institutions and industrial consortia. They represent main players in the field of consumer electronics, content holders and leading academic institutions. Often, these proposals represent years of research work in multimedia retrieval. The best proposals were chosen as the basis of the MPEG-7 Standard, which will now be further developed in a collaborative effort, to be finally issued in the third quarter of 2001.

With MPEG-4 Version 1 finalized, MPEG expected product plans to be revealed soon, but it was still a surprise to see the first hardware announced by Sharp. The company will start selling an MPEG-4 video camera in April. It records up to an hour on a 32 Mbyte memory card. The material can be easily transferred to a PC, and sent as a videomail, or published on a homepage: Microsoft's Windows® Media Player will play the file 'as is'. The camera, which employs MPEG-4's Simple Profile and can also record digital (JPEG) pictures, is offered for 60.000 Yen, about $600.

MPEG-4 Version 2 'Committee Draft' sent out for Ballot

The second version of MPEG-4, which is issued in the form of a number of additions to the already finalized version 1, was completed and will shortly be sent to National Standardization Bodies for voting and comments. These will be reviewed at the 48th MPEG meeting, which will take place in Vancouver, Canada in July. Version 2 adds error resilience and fine-grain scalability to the audio coding tool set. Fine-grain scalability is also being developed for Video coding, but will debut only after version 2, albeit only shortly. Using it, content that has been encoded and stored once can be played out at various bitrates, adapting to available network resources. Layers of extra information can be dynamically added or deleted, increasing or decreasing the quality in fine steps. Up to seven of the steps will be supported in video coding, and audio supports even more. "As not only servers, but also routers can decide to drop layers, the technique has an obvious application area in Internet multimedia, said Rob Koenen of KPN Research in the Netherlands, chairman of MPEG's Requirements Group. According to Mr. Koenen, more application areas exist, such as real-time adaptive multiplexing of pre-encoded content in broadcast systems."Currently, adaptive or 'statistical' multiplexing on-the fly is

only possible with real-time encoders, and not with content stored in encoded form. Fine-grain scalability can change this situation", Mr. Koenen explained.

MPEG is now expanding the bitrates covered in MPEG-4 all the way up to 1 Gigabit per second, for use in multi-generation studio coding systems that could handle very large picture sizes (up to 4k x 4k pixels). Dr. Thomas Sikora of the Heinrich Hertz Institute in Germany, chairman of MPEG's Video Group, commented that "it is remarkable to see that the single coding technology used in MPEG-4 can span the entire range of quality levels, essentially from ten to one million kilobits per second."

On the transport side, two important specifications are being finalized for MPEG-4 content. Firstly, the Audio/Video Transport (AVT) Working Group of the Internet Engineering Task Force (IETF) and MPEG jointly work on specifying the carriage of MPEG-4 over the Real-Time Protocol (RTP). IETF and MPEG experts met over the telephone during the week in Korea. The second specification is for MPEG-4 over MPEG-2 Systems. This specification will allow MPEG-4 program elements, such as interactive advertisements, to be added to digital (MPEG-2 based) television programs. It will also support the transportation of complete MPEG-4 programming in MPEG-2 broadcast multiplexes. MPEG-2 transport is an important environment since it is used around the world in digital television.

Subjective tests have shown that MPEG-4's object based functionalities do not come at the expense of efficiency. The formal tests demonstrated that there was no difference between the quality of object-based coded and frame-based coded material. These tests were carried out at low rates (64-384 kbit/s) and at rates from 512-1150 kbit/s.

Work on MPEG-7 started

The new MPEG-7 standard will define a Description Definition Language for multimedia content and so-called Descriptors, the components used to build the composite structures termed Description Schemes. A set of commonly useful Description Schemes will also be provided by MPEG. Additionally, the standard will define the necessary elements to use the standard in hardware and software implementations, and on telecommunications networks. A reference software implementation and a set of conformance tests make the set of standardized elements complete.

Organizations that are working on MPEG-7 and want to use it when it is ready include archive owners, content managers, manufacturers of multimedia systems, organizations dealing with intellectual property rights and CE companies. They believe an international standard will make it easier to exchange information about content and the content itself. Also, searches for content beyond an organization's boundaries, currently very difficult to effect, will become much easier with MPEG-7. Other areas of use include automatic processing of audiovisual information by computers (e.g. for surveillance purposes) and the creation of 'intelligent content' that can adapt itself to the increasing multitude of multimedia access devices with very different bandwidth and display capabilities.

The head start with the development of MPEG-7 was possible because 132 people met for a full week in February, in a special evaluation meeting held in Lancaster, UK. There, 13 teams of expert evaluators closely scrutinized the 392 proposals, and picked the best pieces from each of them as candidates for inclusion in the MPEG-7 standard. The work now entails combining these chosen elements, or devising tests to see which one of multiple comparable techniques works best.

The 47th MPEG meeting, with an attendance of over 350, was organized by the Korean National Institute of Technology and Quality, the Korean National Body of ISO and IEC and the Korean Industrial Standards Institute. The special February MPEG-7 evaluation meeting was organized and hosted by the Distributed Multimedia Research Group of Lancaster University in the UK.

The first technical MPEG-7 experiments have started on Descriptors for color (e.g. a histogram),

various types of motion descriptors and on descriptors for shape. Already now, products are available that use such descriptors for similarity-based search, but no standardized solution exists yet. A Description Scheme (DS) could for instance describe a complete movie as a hierarchical structure of scenes, shots and frames —all Description Schemes in their own right. Such a DS could describe things like duration, author, title and actors. It could also contain descriptors for, e.g., dominant color frequency, shapes of objects and musical structure. Users of the MPEG-7 Standard will be able to define their own Description Schemes with the Description Definition Language (DDL), but efficient, standardized DSs will be provided by MPEG for, e.g., broadcast applications and small devices with limited computational power. A majority of the proposed DDL candidates were built on the eXtensible Markup Language as defined by the W3C (www.w3c.org), and indeed XML was adopted for developing the DDL.

The ‘convenor’ of MPEG, Dr. Leonardo Chiariglione of CSELT in Italy, said he was happy to see companies and institutes ready to bring their state-of-the-art technology to MPEG. "Technology has been under development for quite some time in many research institutes, and we think the time is right for standardizing the pieces that will allow different systems to talk to each other. Dr. Chiariglione stressed that MPEG would not standardize search engines and information extraction mechanisms. "We only standardize what is needed for interworking. The rest should be left to competition in the market place."

Head of the US delegation Mr. Peter Schirling of IBM, which had several submissions to the MPEG-7 evaluation, said he was very pleased with the progress in MPEG-7. "Like many other companies, IBM has worked on intelligent multimedia retrieval systems for a number of years, and we have products in the market today. But we see great benefit in harmonizing a format for content description, that will s allow IBM and others to build our own products" said Mr. Schirling.

Further information

Future MPEG meetings will be held in Vancouver, Canada (12-16 July '99), Melbourne, Australia (October '99), Hawaii, US (December '99) and the Netherlands (March 2000).

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This press release and much other MPEG-related information can be found on the MPEG homepage:

http://www.cselt.it/mpeg

The MPEG homepage has links to other MPEG pages, which are maintained by MPEG’s subgroups. It also contains links to public documents, available for download also to non-MPEG members.

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More information about Sharp's MPEG-4 'VN-EZ1 Internet ViewCam' can be found at http://sharp-world.com/sc/gaiyou/news-e/990317.html

Annex - Alphabetical list of parties (companies, consortia, universities, projects) that have submitted a proposal in response to the MPEG-7 Call for Proposals

1. ACTS - Custom TV
2. ACTS - Diceman
3. ACTS - MODEST
4. AT&T
5. Audio Consortium
6. Avid Technology
7. BBC R&D
8. Canon Inc.
9. Carnegie Mellon University
10. Columbia University
11. CUIDAD Working Group
12. DiamondBack Systems, Inc.
13. Digital Imaging Group
14. Distributed Systems Technology Centre
15. ETRI
16. GMD-IPSI
17. Hanyang University
18. Heinrich Hertz Institute
19. Hyundai Electronics Industries Company
20. IBM
21. Inesc-Porto
22. Information Broadcasting Labs., Inc.
23. Institut National des Telecommunications
24. IPAL, KDRL
25. IRISA/INRIA
26. Kent Ridge Digital Labs
27. Korea University
28. Kwang-Ju Institute of Science & Technology
29. LG Corporate Institute of Technology
30. LG Electronics Research Center of America Inc.
31. LIGIM
32. MIT Media Lab
33. Mitsubishi Electric Corporation
34. National Research Council

35. NEC Corporation
36. NHK (Japan Broadcasting Corp)
37. Philips
38. Ricoh Company, Ltd.
39. Samsung Electronics
40. Sarnoff Corporation
41. Sharp Laboratories of America
42. Siemens AG
43. Sony Corporation
44. Starlab
45. TASC, Inc.
46. Tektronix Inc.
47. Telecommunications Advancement Organization of Japan
48. Toshiba Corporation R&D Center
49. TU-Munich, Institute for Integrated Circuits
50. Univ. of California, Santa Barbara
51. Universidad Politecnica de Madrid,
52. Universite Pierre et Marie Curie
53. University of Brescia
54. University of British Columbia
55. University of Illinois at Urbana Champaign
56. University of Rochester
57. University of Southern California
58. University of Southern California, HRL Laboratories
59. University of Washington, Dept. of Electrical Engineering