ISO/IEC JTC 1/SC 29  
Coding of audio, picture, multimedia and hypermedia information  
Secretariat: JISC (Japan)

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Press Release of the 92nd JPEG meeting

JPEG (ISO/IEC JTC 1/SC 29/WG1)

Coding of Still Pictures

JBIG
Joint Bi-level Image Experts Group

JPEG
Joint Photographic Experts Group

TITLE: Press Release of the 92nd JPEG meeting

SOURCE: JPEG (ISO/IEC JTC 1/SC 29/WG1)

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REQUESTED ACTION: Distribution, publication on JPEG and SC29 websites

DISTRIBUTION: Public

Contact:
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Title: Press Release of the 92nd JPEG Meeting, 7-13 July 2021

Source: JPEG

Press Release
For immediate distribution
Contacts: Antonio Pinheiro, Frederik Temmermans (pr@jpeg.org)

JPEG Committee explores NFT standardization needs

The 92nd JPEG meeting was held online from 7 to 13 July 2021.

The 92nd meeting has consolidated JPEG’s exploration on standardization needs related to Non-Fungible Tokens (NFTs). Recently, there has been a growing interest in the use of NFTs in many applications, notably in the trade of digital art and collectibles.

Other notable results of the 92nd JPEG meeting have been the release of an update to the Call for Proposals on JPEG Pleno Holography and an initiative to revisit opportunities for standardization of image quality assessment methodologies and metrics.

The following provides an overview of the major achievements of the 92nd JPEG meeting.

JPEG NFT

Recently, Non-Fungible Tokens (NFTs) have garnered considerable interest. Numerous digital assets linked with NFTs are either encoded in existing JPEG formats or can be represented in JPEG-developed current and forthcoming representations. Additionally, various trust and security concerns have been raised about NFTs and the digital assets on which they rely. To better understand user requirements for media formats, the JPEG Committee has launched the JPEG NFT exploration initiative. The mission of JPEG NFT is to provide effective specifications that enable various applications that rely on NFTs applied to media assets. A JPEG NFT standard shall be secure, trustworthy, and eco-friendly, enabling an interoperable ecosystem based on NFTs within or across applications. The committee strives to engage stakeholders from diverse backgrounds, including the technical, legal, artistic, and end-user communities, to establish use cases and requirements. In this context, a first JPEG NFT Workshop was held on July 1st, 2021. The workshop's presentations and video footage are now accessible on the JPEG website, and a second workshop will be held in the near future. JPEG encourages interested parties to frequently visit its website for the most up-to-date information and to subscribe to the mailing list of the JPEG NFT Ad Hoc Group (AhG) in order to participate in this effort. Instructions on how to join the AhG established for this purpose can be accessed via http://listregistration.jpeg.org.
JPEG Fake Media

The scope of the JPEG Fake Media exploration is to assess standardization needs to facilitate secure and reliable annotation of media asset creation and modifications in good-faith usage scenarios as well as in those with malicious intent. At the 92nd meeting, the JPEG Committee released an updated version of the “JPEG Fake Media Context, Use Cases and Requirements” document. This new version includes an improved and extended set of requirements covering three main categories: media creation and modification descriptions, metadata embedding & referencing and authenticity verification. In addition, the document contains several improvements including an extended set of definitions covering key terminologies. The JPEG Committee welcomes feedback to the document and invites interested experts to join the JPEG Fake Media AhG mailing list to get involved in the discussion.

JPEG Pleno

Currently a Call for Proposals is open for JPEG Pleno Holography, which is the first standardization effort aspiring to provide a versatile solution for efficient compression of holograms for a wide range of applications such as holographic microscopy, tomography, interferometry, printing, and display, and their associated hologram types. Key desired functionalities include support for both lossy and lossless coding, scalability, random access, and integration within the JPEG Pleno system architecture, with the goal of supporting a royalty-free baseline. In support of this Call for Proposals, a Common Test Conditions document and accompanying software have been released, enabling elaborate stress testing from the rate-distortion, functionality and visual rendering quality perspectives. For the latter, numerical reconstruction software has been released enabling viewport rendering from holographic data. References to software and documentation can be found on the JPEG website.

JPEG Pleno Point Cloud continues to progress towards a Call for Proposals on learning-based point cloud coding solutions with the release at the 92nd JPEG meeting of an updated Use Cases and Requirements document. This document details how the JPEG Committee envisions learning-based point cloud coding solutions meeting the requirements of rapidly emerging use cases in this field. This document continues the focus on solutions supporting scalability and random access while detailing new requirements for 3D processing and computer vision tasks performed in the compressed domain to support emerging applications such as autonomous driving and robotics.

JPEG AI

JPEG AI scope is the creation of a learning-based image coding standard offering a singlestream, compact compressed domain representation, targeting both human visualization with significant compression efficiency improvement over image coding
standards in common use at equivalent subjective quality, and effective performance for image processing and computer vision tasks. At the 92nd JPEG meeting, several activities were carried out towards the launch of the final JPEG AI Call for Proposals. This has included improvements of the training and test conditions for learning-based image coding, especially in the areas of the JPEG AI training dataset, target bitrates, computation of quality metrics, subjective quality evaluation, and complexity assessment. A software package called the JPEG AI objective quality assessment framework, with a reference implementation of all objective quality metrics, has been made available. Moreover, the results of the JPEG AI exploration experiments for image processing and computer vision tasks defined at the previous 91st JPEG meeting were presented and discussed, including their impact on Common Test Conditions.

Moreover, the JPEG AI Use Cases and Requirements were refined with two new core requirements regarding reconstruction reproducibility and hardware platform independence. The second draft of the Call for Proposals was produced and the timeline of the JPEG AI work item was revised. It was decided that the final Call for Proposals will be issued as an outcome of the 94th JPEG Meeting. The deadline for expression of interest and registration is 5 February 2022 and the submission of bitstreams and decoded images for the test dataset are due on 30 April 2022.

JPEG AIC

Image quality assessment remains an essential component in the development of image coding technologies. A new activity has been initiated in the JPEG AIC framework to study the assessment of image coding quality, with particular attention to crowd-sourced subjective evaluation methodologies and image coding at fidelity targets relevant for end-user image delivery on the web and consumer-grade photo archival.

JPEG Systems

JUMBF (ISO/IEC 19566-5 AMD1) and JPEG 360 (ISO/IEC 19566-6 AMD1) are now published standards available through ISO. A request to create a second amendment of JUMBF (ISO/IEC 19566-5) has been produced; this amendment will further extend the functionality to cover use cases and requirements under development in the JPEG Fake Media exploration initiative. The Systems software efforts are progressing on the development of a file parser for most JPEG standards and will include support for metadata within JUMBF boxes. Interested parties are invited to subscribe to the mailing list of the JPEG Systems AhG in order to monitor and contribute to JPEG Systems activities.

JPEG XS

JPEG XS aims at standardization of a visually lossless low-latency and lightweight compression that can be used as a mezzanine codec in various markets. With the second editions of Part 1 (core coding system), Part 2 (profiles and buffer models), and Part 3 (transport and container formats) under ballot to become International Standards, the
work during this JPEG meeting went into the second editions of Part 4 (Conformance Testing) and Part 5 (Reference Software). The second editions primarily bring new coding and signalling capabilities to support raw Bayer sensor content, mathematically lossless coding of images with up to 12 bits per colour component sample, and 4:2:0-sampled image content. In addition, the JPEG Committee continued its initial exploration to study potential future improvements to JPEG XS, while still honouring its low-complexity and low-latency requirements. Among such improvements are better support for high dynamic range (HDR), better support for raw Bayer sensor content, and overall improved compression efficiency. The compression efficiency work also targets improved handling of computer-screen content and artificially-generated rendered content.

JPEG XL

JPEG XL aims at standardization for image coding that offers high compression efficiency, along with features desirable for web distribution and efficient compression of high quality images. JPEG XL Part 3 (Conformance testing) has been promoted to the Committee Draft stage of the ISO/IEC approval process. New core experiments were defined to investigate hardware-based coding, in particular including fixed-point implementations. With preliminary support in major web browsers, image viewing and manipulation libraries and tools, JPEG XL is ready for wide-scale adoption.

JPEG DNA

The JPEG Committee has continued its exploration of the coding of images in quaternary representations, as is particularly suitable for DNA storage. Two new use cases were identified as well as the sequencing noise models and simulators to use for DNA digital storage. There was a successful presentation of the fourth workshop by the stakeholders, and a new version of the JPEG DNA overview document was issued and is now publicly available. It was decided to continue this exploration by organizing a fifth workshop and to conduct further outreach to stakeholders, as well as to continue improving the JPEG DNA overview document. Moreover, it was also decided to produce software to simulate an end-to-end image storage pipeline using DNA storage for future exploration experiments. Interested parties are invited to consider joining the effort by registering to the mailing list of JPEG DNA.

“The JPEG Committee is considering standardization needs for timely and effective specifications that can best support the use of NFTs in applications where media assets can be represented with JPEG formats” said Prof. Touradj Ebrahimi, the Convenor of the JPEG Committee.
**About JPEG**

The Joint Photographic Experts Group (JPEG) is a Working Group of ISO/IEC, the International Organization for Standardization / International Electrotechnical Commission, (ISO/IEC JTC 1/SC 29/WG 1) and of the International Telecommunication Union (ITU-T SG16), responsible for the popular JPEG, JPEG 2000, JPEG XR, JPSearch, JPEG XT and more recently, the JPEG XS, JPEG Systems, JPEG Pleno, JPEG XL and JPEG AI families of imaging standards.

The JPEG Committee nominally meets four times a year. The 91st JPEG Meeting was held online from 19 to 23 April 2021. The next 93rd JPEG Meeting will be held online from 18 to 22 October 2021.

More information about JPEG and its work is available at jpeg.org or by contacting Antonio Pinheiro or Frederik Temmermans (pr@jpeg.org) of the JPEG Communication Subgroup.

If you would like to stay informed about JPEG activities, please subscribe to the jpeg-news mailing list on http://jpeg-news-list.jpeg.org.

Upcoming JPEG meetings are planned as follows:
- No 93, to be held online during 18-22 October 2021.
- No 94, to be held online during 17-21 January 2022.