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Press Release of the 93rd JPEG meeting

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

Joint Bi-level Image Experts Group

JPEG

Joint Photographic Experts Group

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Press Release
For immediate distribution
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**JPEG Committee launches a Call for Proposals on Learning based Point Cloud Coding**

The 93\textsuperscript{rd} JPEG meeting was held online from 18 to 22 October 2021. The JPEG Committee continued its work on the development of new standardised solutions for the representation of visual information. Notably, the JPEG Committee has decided to release a new call for proposals on point cloud coding based on machine learning technologies that targets both compression efficiency and effective performance for 3D processing as well as machine and computer vision tasks. This activity will be conducted in parallel with JPEG AI standardization. Furthermore, it was also decided to pursue the development of a new standard in the context of the exploration on JPEG Fake News activity.

Considering the response to the Call for Proposals on JPEG Pleno Holography, a first standard for compression of digital holograms has entered its collaborative phase. The response to the call for proposals identified a reliable coding solution for this type of visual information that overcomes the limitations of the state of the art coding solutions for holographic data compression.

The following provides an overview of the major achievements carried out during the 93\textsuperscript{rd} JPEG meeting.

**JPEG Pleno Point Cloud Coding**

JPEG Pleno is working towards the integration of various modalities of plenoptic content under a single and seamless framework. Efficient and powerful point cloud representation is a key feature within this vision. Point cloud data supports a wide range of applications for human and machine consumption including autonomous driving, computer-aided manufacturing, entertainment, cultural heritage preservation, scientific research and advanced sensing and analysis. During the 93rd JPEG meeting, the JPEG Committee released a Draft Call for Proposals on JPEG Pleno Point Cloud Coding. This call addresses learning-based coding technologies for point cloud content.
and associated attributes with emphasis on both human visualization and
decompressed/reconstructed domain 3D processing and computer vision with
competitive compression efficiency compared to point cloud coding standards in
common use, with the goal of supporting a royalty-free baseline. A Final Call for
Proposals on JPEG Pleno Point Cloud Coding is planned to be released in January
2022.

JPEG Pleno Holography
At its 93rd JPEG meeting, the committee reviewed the response to the Call for
Proposals on JPEG Pleno Holography, which is the first standardization effort aspiring
to 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. The coding technology selected provides
excellent rate-distortion performance for lossy coding, in addition to support for lossless
coding and random access via a space-frequency segmentation approach. The
selected technology will serve as baseline for the standard specification to be
developed. This final specification is planned to be published as an international
standard in early 2024.

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.

During the 93rd JPEG meeting, the JPEG AI project activities were focused on the
analysis of the results of the exploration studies as well as refinements and improvements
on common training and test conditions, especially the performance assessment of the
image classification and super-resolution tasks. A related topic that received much
attention was device interoperability which was thoroughly analyzed and discussed. Also,
the JPEG AI Third Draft Call for Proposals is now available with improvements on
evaluation conditions and proposal composition and requirements. A final call for
proposals is expected to be issued at the 94th meeting (17-21 January 2022) and to
produce a first Working Draft by October 2022.

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 93rd meeting,
the JPEG Committee released an updated version of the “JPEG Fake Media Context, Use Cases and Requirements” document. The new version includes an extended set of definitions and a new section related to threat vectors. In addition, the requirements have been substantially enhanced, in particular those related to media asset authenticity and integrity. Given the progress of the exploration, an initial timeline for the standardization process was proposed:

April 2022: Issue call for proposals  
October 2022: Submission of proposals  
January 2023: Start standardization process  
January 2024: Draft International Standard (DIS)  
October 2024: International Standard (IS)

The JPEG Committee welcomes feedback on the working document and invites interested experts to join the JPEG Fake Media AhG mailing list to get involved in this standardization activity.

JPEG NFT

Non-Fungible Tokens (NFTs) have recently attracted substantial interest. Numerous digital assets associated with NFTs are encoded in existing JPEG formats or can be represented in JPEG-developed current and future representations. Additionally, several trust and security concerns have been raised about NFTs and the underlying digital assets. The JPEG Committee has established the JPEG NFT exploration initiative to better understand user requirements for media formats. JPEG NFT’s mission is to provide effective specifications that enable various applications that rely on NFTs applied to media assets. The standard shall be secure, trustworthy, and environmentally friendly, enabling an interoperable ecosystem based on NFT within or across applications. The group seeks to engage stakeholders from various backgrounds, including technical, legal, creative, and end-user communities, to develop use cases and requirements. On October 12th, 2021, a second JPEG NFT Workshop was organized in this context. The presentations and video footage from the workshop are now available on the JPEG website. In January 2022, a third Workshop will focus on commonalities with the JPEG Fake Media exploration. JPEG encourages interested parties to visit its website frequently for the most up-to-date information and to subscribe to the JPEG NFT Ad Hoc Group’s (AhG) mailing list to participate in this effort.

JPEG AIC

During the 93rd JPEG Meeting, work was initiated on the first draft of a document on use cases and requirements regarding Assessment of Image Coding. The scope of AIC activities was defined to target standards or best practices with respect to subjective and objective image quality assessment methodologies that target a range from high quality to near-Visually lossless quality. This is a range of visual qualities where artifacts are not
noticeable by an average non-expert viewer without presenting an original reference image but are detectable by a flicker test.

JPEG XS

The JPEG Committee created an updated document “Use Cases and Requirements for JPEG XS V3.0”. It describes new use cases and refines the requirements to allow improving the coding efficiency and to provide additional functionality w.r.t. HDR content, random access and more. In addition, the JPEG XS second editions of Part 1 (Core coding system), Part 2 (Profiles and buffer models), and Part 3 (Transport and container formats) went to the final ballot before ISO publication stage. In the meantime, the Committee continued working on the second editions of Part 4 (Conformance Testing) and Part 5 (Reference Software), which are now ready as Draft International Standards. In addition, the decision was made to create an amendment to Part 2 that will add a High420.12 profile and a new sublevel at 4 bpp, to swiftly address market demands.

JPEG XL

Part 3 (Conformance testing) has proceeded to DIS stage. Core experiments were discussed to investigate hardware coding, in particular fixed-point implementations, and will be continued. Work on a second edition of Part 1 (Core coding system) was initiated. With preliminary support in major web browsers, image viewing and editing software, 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. An important progress in this activity is the implementation of an experimentation software to simulate the coding/decoding of images in quaternary code. A thorough explanation of the package has been created, and a wiki for documentation and link to the code can be found here [www.i3s.unice.fr/~am/JpegDNA/](http://www.i3s.unice.fr/~am/JpegDNA/). A successful fifth workshop on JPEG DNA was held prior to the 93rd JPEG meeting 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 validating and extending the JPEG DNA experimentation software to simulate an end-to-end image storage pipeline using DNA for future exploration experiments, as well as improving the JPEG DNA overview document. Interested parties are invited to consider joining the effort by registering to the mailing list of JPEG DNA.
“Aware of the importance of timely standards in AI-powered imaging applications, the JPEG Committee is moving forward with two concurrent calls for proposals addressing both image and point cloud coding based on machine learning.” 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 Organisation 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 92nd JPEG Meeting was held online from 7 to 13 July 2021. The next 94th JPEG Meeting will be held online from 17 to 21 January 2022.

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-mailing lists on http://listregistration.jpeg.org/.

Future JPEG meetings are planned as follows:
- No 94, will be held online during 17-21 January 2022.