



TITLE: Final Call for Proposals for JPEG Fake Media

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Final Call for Proposals for JPEG Fake Media

Summary

Recent advances in media creation and modification technologies allow the production of near realistic media assets that are often, to the human eye, indistinguishable from original assets. These developments open opportunities for creative production of new media in the entertainment and art industry. However, the intentional or unintentional spread of manipulated media, such as modified media with the intention to induce misinterpretation, also imposes risks such as social unrest, spread of rumours for political gain or encouraging hate crimes.

Clear and transparent annotation of media asset creation and modifications is a crucial element in many usage scenarios bringing trust to the users. This has already triggered various organizations to develop a wide range of mechanisms that can detect and/or annotate modified media assets when they are shared. However, these annotations should be attached to the media in a secure way to deter them from being altered. In addition, to achieve a wide adoption of such an annotation ecosystem, interoperability is essential and this clearly calls for a standard.

This document is a final call for proposals on *JPEG Fake Media*. The scope of JPEG Fake Media is the creation of a standard that can facilitate the secure and reliable annotation of media asset creation and modifications. The standard shall address use cases that are in good faith as well as those with malicious intent.

Final Call for Proposals for JPEG Fake Media

1. Introduction

Current technologies permit the modification or synthetic creation of media assets. Some, like deep learning methods, can create media assets that are hard to distinguish from natural media assets to the human eye. These developments open new, creative opportunities that are useful for the entertainment industry and other business usage. However, this also leads to issues relating to the use of manipulated media to spread disinformation. Misuse of manipulated media can cause social unrest, spread rumours for political gain, or encourage hate crimes.

In many application domains, creators may want or need to declare the type of modifications that were performed on the media asset, in opposition to other situations where the intention is to hide the existence of manipulations. Media modifications are not always negative as they are increasingly a normal and legal component of the production pipeline. This is already leading various governmental organizations to plan new legislation. Some companies, including social media platforms and news outlets, are developing mechanisms that would clearly detect and annotate manipulated media when they are shared, attempting to avoid negative impacts.

While growing efforts are noticeable in developing technologies, there is a need to have a standardized way to annotate media assets (regardless of the intent) and securely link the assets and annotations together. Therefore, the JPEG standardization committee (under auspices of ISO, IEC, and ITU) calls for contributions to address the standardization needs related to the facilitation of the secure and reliable annotation of media assets through an in-depth analysis of various usage scenarios. While the initiative is called *JPEG Fake Media*, it is important to stress that it addresses both good faith and malicious usage scenarios.

In preparation of this call, the JPEG committee conducted an exploration study to interact with stakeholders and to better understand applications and scenarios relevant to JPEG Fake Media. In this context several workshops were organized. The proceedings and video recordings are available on the [JPEG website](#):

- 1st JPEG Fake Media Workshop Proceedings, ISO/IEC JTC1/SC29/WG1, WG1N90026, Online, December 15th, 2020.
- 2nd JPEG Fake Media Workshop Proceedings, ISO/IEC JTC1/SC29/WG1, WG1N91019, Online, March 25th, 2021.
- 3rd JPEG NFT and Fake Media Workshop Proceedings, ISO/IEC JTC1/SC29/WG1, WG1N100102, Online, January 11th, 2022.
- 4th JPEG NFT Fake Media Workshop Proceedings, ISO/IEC JTC1/SC29/WG1, WG1N100159, Online, April 12th, 2022.

As a result of the exploration study, the JPEG committee identified key requirements for a standard in this domain. More specifically, a set of requirements in three key categories were identified:

- Media creation and modification descriptions
- Metadata embedding and referencing
- Authenticity, integrity, and trust model

A detailed overview of the Use Cases and Requirements for JPEG Fake Media can be found in [document number WG1N100156](#) [1]. The document also defines the terms and concepts as used throughout this call for proposals.

2. Scope

The scope of JPEG Fake Media is the creation of a standard that can facilitate a secure and reliable annotation of media asset creation and modifications. The standard shall address use cases that are in good faith as well as those with malicious intent.

3. Use Cases and Requirements

The JPEG committee has identified use cases related to the following topics:

- **Misinformation and disinformation**
 - Deepfakes
 - Manipulated media
 - Media intentionally used out of context
- **Forgery / Media forensics**
 - Document authenticity & forgery (e.g. IDs and passports)
 - Insurance fraud (e.g. pictures of accidents)
 - KYC (Know Your Customer) (e.g. fake identity)
 - Impostering (e.g. impersonating a celebrity)
- **Media creation**
 - Authenticity & integrity in photography & videography
 - Use of deepfakes for special effects
 - Green screens, media processing and composition
 - GAN (Generative Adversarial Network) images
 - Short content bursts
 - UGC (User Generated Content) e.g. TikTok, Triller, Adobe Spark
 - Picture and movies production
- **Media modification**
 - Media asset editing software
 - Movie preservation
 - Film enhancement
 - Restoration of old movies or photographs

Based on the use cases, the JPEG committee identified key requirements in three key categories:

- Media creation and modification descriptions
- Metadata embedding and referencing
- Authenticity, integrity, and trust model

More elaborate use cases and associated requirements are defined in the associated [“Use Cases and Requirements for JPEG Fake Media” document \(WG1N100156\)](#) [1].

4. Evaluation Conditions and Processes

4.1. Proposal phase

- Proposals shall address at least one of the specified requirements in any of the three requirements categories specified in the “Use Cases and Requirements for JPEG Fake Media” document (WG1N100156) [1].
- Respondents are not required to be accredited JPEG experts at the time of submission.
- JPEG encourages proposals that include implementations in conjunction with the proposal.

4.2. Evaluation phase

- The respondents shall present their proposal during a JPEG meeting and participate in the discussion.
- The proposals will be evaluated by accredited JPEG experts.
- Experiments might be designed to compare specific elements among proposals.

4.3. Standardization phase

- After the evaluation phase, a collaborative process for standardization will be initiated.
- During the standardization phase, elements of complementary proposals may be combined into a single coherent specification.
- Respondents of selected proposals are expected to engage with JPEG as part of the development of the standard.

NOTE: All decisions during the evaluation and standardization phases will be made by consensus in line with the ISO processes.

5. Timeline

Currently, the following timeline is targeted:

- 2022-01-21: issue Draft Call for Proposals
- 2022-04-29: issue Final Call for Proposals
- **2022-07-20 registration of interest**
- **2022-10-19 submission of proposals**
- **2022-10-24 to 2022-10-28 evaluation of proposals**
- 2023-01: first Working Draft (WD)
- 2024: Draft International Standard (DIS)
- **2025: International Standard (IS)**

NOTE: This timeline is indicative and may be updated in the future.

6. Proposal Composition and Requirements

6.1. Proposal Elements

1. Brief summary of the proposal.
2. Detailed technical description of the proposal.
3. Requirements compliance table: proponents must indicate which requirements they address and how they are addressed via the attached “JPEG Fake Media Requirements Compliance Table” sheet.
4. Optional evidence to support the proposal, including used technologies, documentation, ...
5. Optional implementation for demonstration of the proposal.

6.2. Proposal Registration of Interest

Proponents are highly encouraged to express their interest to submit a proposal to this call before the deadline specified in Section 5 of this document. The registration of interest shall be made by filling in [this form \(https://fake-media-registration.jpeg.org\)](https://fake-media-registration.jpeg.org) and/or by sending an e-mail to the JPEG Convenor, JPEG Requirements Subgroup Chair and the JPEG Systems & Integration Subgroup Chair, see contacts in Section 9. The mail should contain the following information:

- Proposal main contact person(s) first name(s) and last name(s)
- Affiliation(s) (optional)
- Contact email address
- Proposal working title
- Additional information (optional)

An acknowledgment of receipt will be sent to the proponent.

6.3. Proposal Submission

Proposals shall be submitted by the deadline specified in Section 5 of this document and shall contain the documents listed in Section 6.1. All proposal documents should be uploaded to the WG1 document registry. Proponents without access to the registry should contact the JPEG Convenor, JPEG Requirements Subgroup Chair and the JPEG Systems & Integration Subgroup Chair, see contacts in Section 9. An acknowledgment of receipt will be sent to the proponent.

6.4. IPR Conditions (ISO/IEC Directives)

Proponents are advised that this call is being made in the framework and subject to the common patent policy of ITU-T/ITU-R/ISO/IEC and other established policies of these standardization organizations. The persons named below as contacts can assist potential submitters in identifying the relevant policy information.

6.5. Contribution to Standardization

Proponents are informed that based on the submitted proposals, a standard specification will be created. If they submit a proposal and (part of) the proposed technology is accepted for inclusion in the standard, they will hence have to attend subsequent WG1 meetings and contribute to the creation of the different standard documents. Within this process, evolution and changes are possible as several technologies may be combined to obtain a better performing solution.

7. Privacy

JPEG is aware that there are legal protections in place in many countries to protect the privacy of individuals and locations and that, in several use cases certain information such as the creator of the image cannot be revealed. Therefore, taking privacy into account is explicitly included in the requirements and will have high priority during the evaluation phase.

8. Royalty-free Goal

The royalty-free patent licensing commitments made by contributors to previous standards, e.g., JPEG 2000 Part 1, have arguably been instrumental to their success. JPEG expects that similar commitments would be helpful for the adoption of future JPEG standards.

9. Participation

Relevant work is conducted by the JPEG Fake Media Ad hoc Group (AhG). Interested parties are invited to join the JPEG Fake Media mailing list via <http://listregistration.jpeg.org> and regularly consult the JPEG.org website for the latest news.

10. Contacts

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References

1. ISO/IEC JTC 1/SC29/WG1, [WG1N100156](#), Use Cases and Requirements for JPEG Fake Media, April 2022.