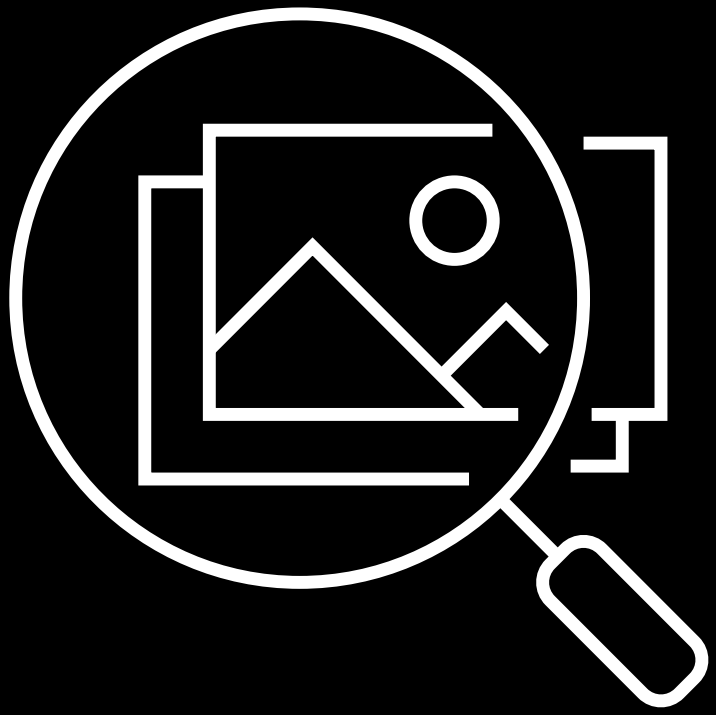
Content Authenticity Initiative x Adobe



CAI and Creating Trust in Media

WENDY A. DINOVA-WIMMER
OFFICE OF THE PUBLIC SECTOR CTO | ADOBE

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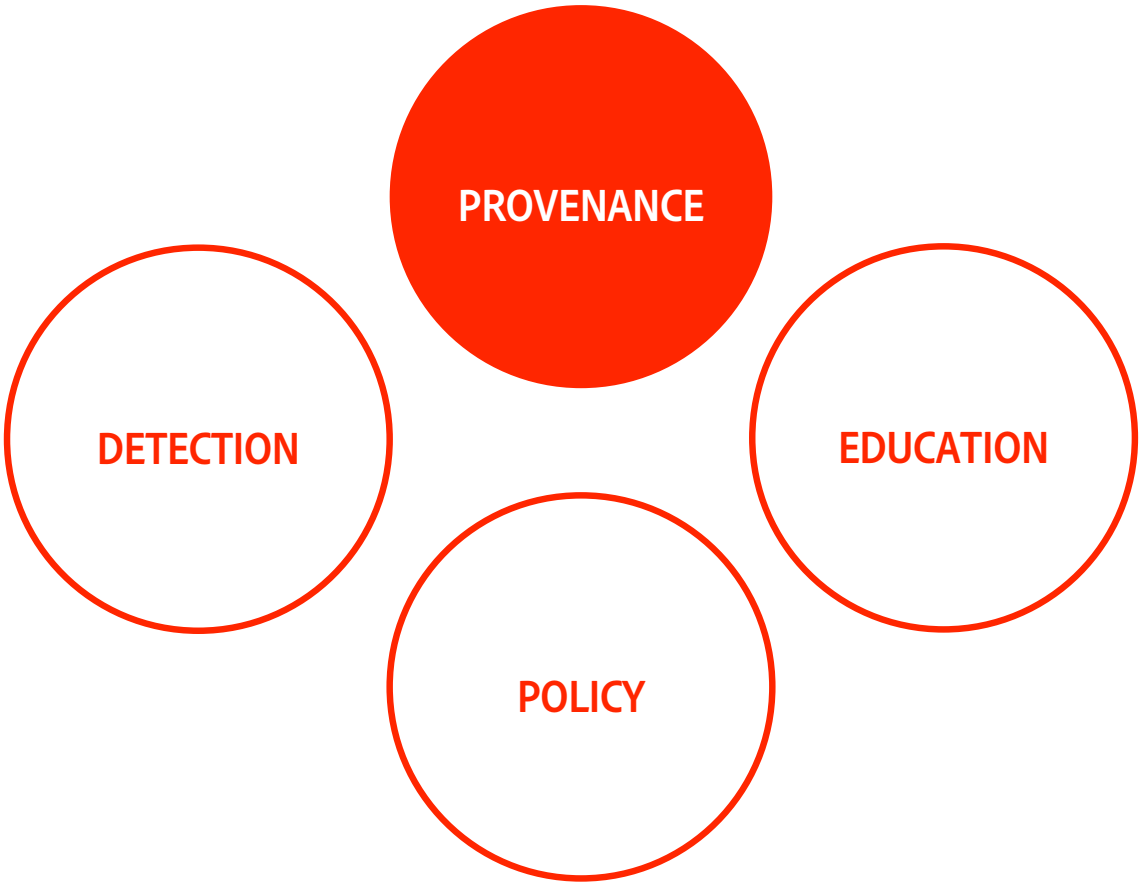
WHAT DOES IT TAKE TO FIGHT MANIPULATED AND SYNTHETIC MEDIA



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PHOTOS AND FAMILY HISTORY

Use this tool because it is very hard to get access to a Google account after death.
https://support.google.com/accounts/answer/3036546?hl=en

Follow the link to see how to set up your legacy person today. This is part of estate planning.
https://www.facebook.com/help/1568013990080948?ref=shareable

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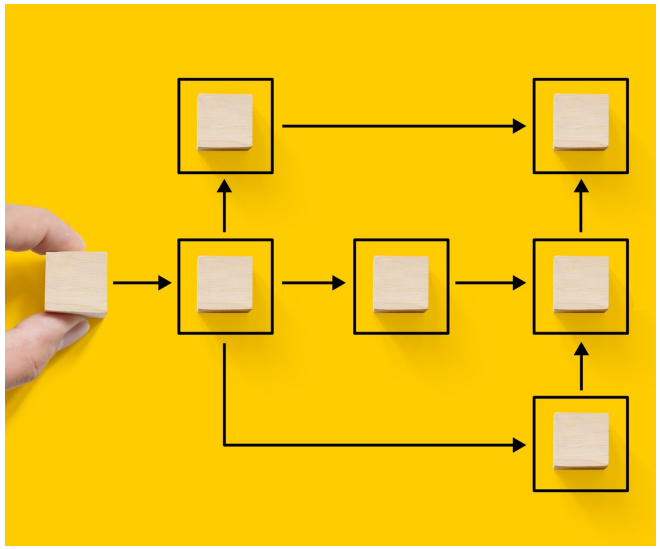

Provenance refers to the basic, trustworthy facts about the origins of a piece of digital content (image, video, audio recording, document).

Provenance: The records describing the possession of, and changes to, components, component processes, information, systems, organization, and organizational processes. Provenance enables all changes to the baselines of components, component processes, information, systems, organizations, and organizational processes, to be reported to specific actors, functions, locales, or activities.

Source(s):

NISTIR 7622 under Provenance

https://contentauthenticity.org/

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CAI & C2PA

Content Authenticity Initiative (CAI)

https://contentauthenticity.org/

Coalition for Content Provenance and Authenticity (C2PA)

https://c2pa.org/

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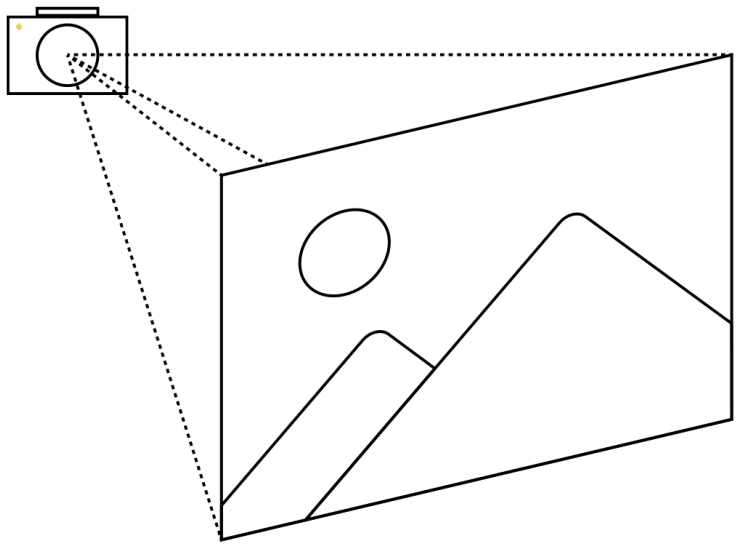
1-CREATE



We use cryptographic asset hashing to provide verifiable, tamper-evident signatures that the image and metadata hasn't been unknowingly altered. At creation, choose what information to attach to the content being created. Throughout this process, the creator of content can choose to preserve attribution or to remain anonymous. Privacy and security of photojournalists and other creators are of the utmost consideration in our work.

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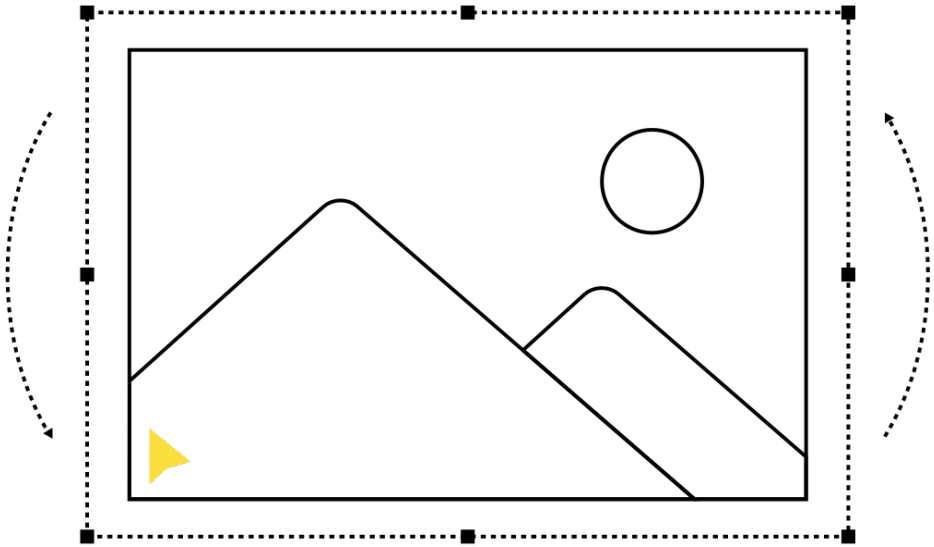
2-EDITING



Using tools like Photoshop, secure capture metadata will be preserved and amended with history data of any alterations to content.

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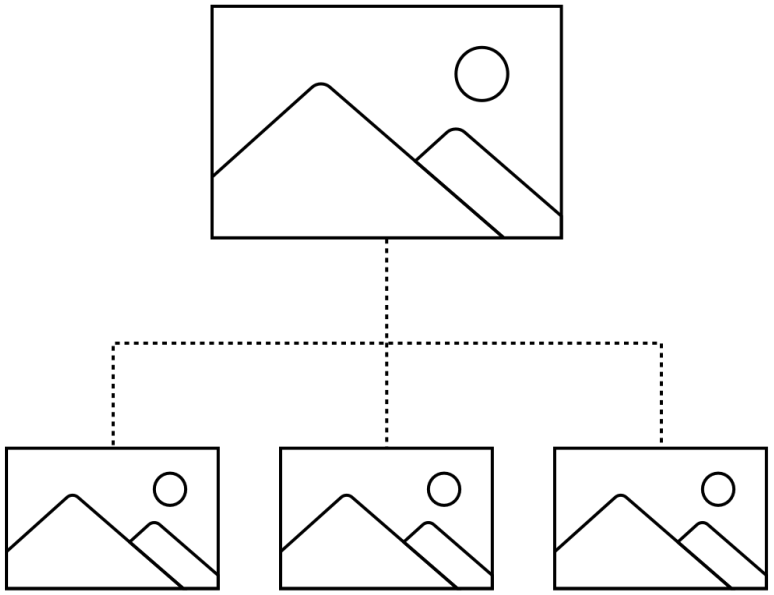
3-PUBLISHING AND SHARING



Through partnerships with news organizations, see secure capture information and any relevant content edits preserved through the publishing process, through integration with publishers' CMS. When content is shared on social networks, the product flow will preserve CAI metadata.

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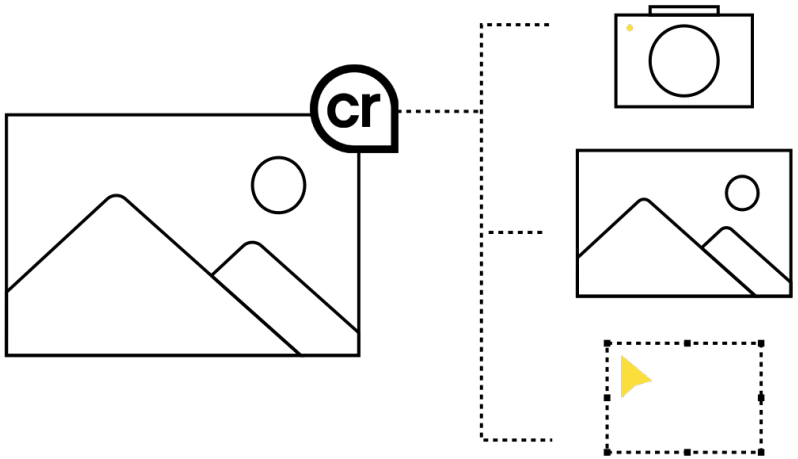
4-VIEWING



As a consumer of digital content, anyone can view historical information about content with CAI metadata through the Verify site.

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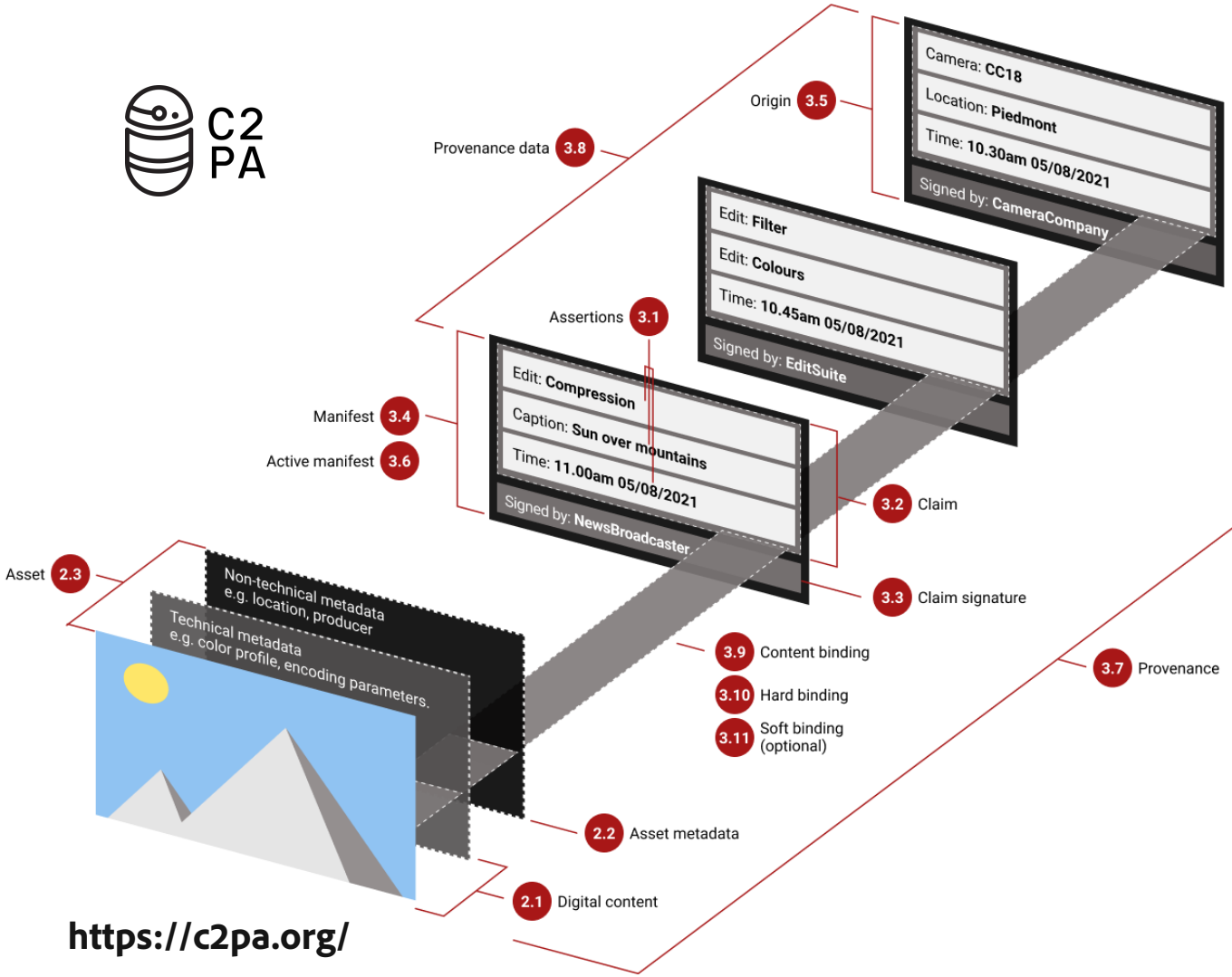

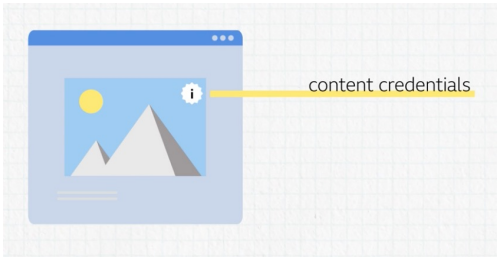

Permanently binding provenance securely to media involves:

Assertions - What was done to an image, by whom, when etc.

Manifest - Package of assertions, asset hashes & signatures

Asset Bindings - Cryptographically connect manifests to media and support recovery

Provenance – chain(s) of Manifests

Verification – protocol for ensuring nothing has been altered

https://c2pa.org/

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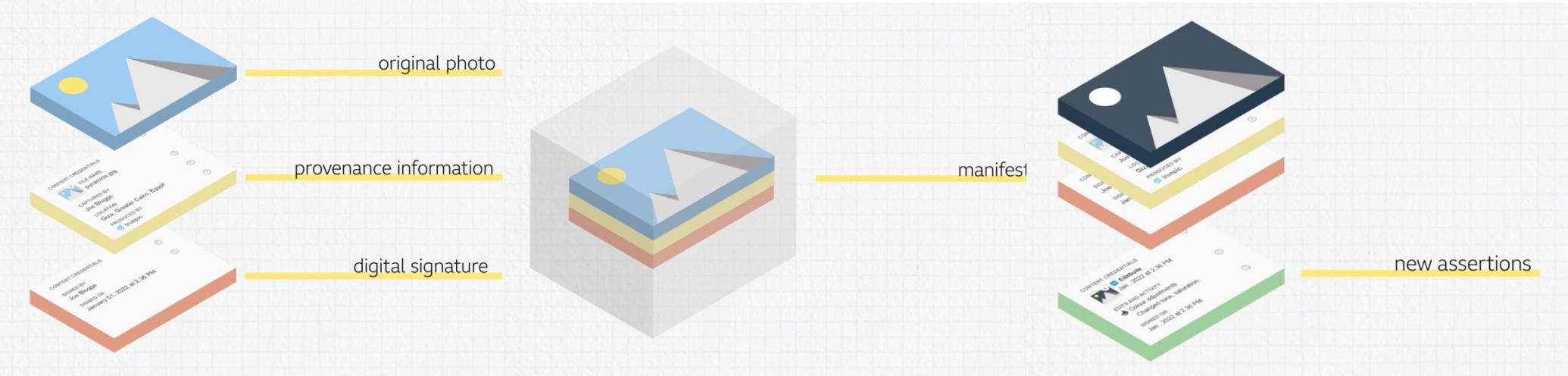
COALITION FOR CONTENT PROVENANCE AND AUTHENTICITY (C2PA)



Signing C2PA manifests requires an end-entity certificate that complies with the C2PA Trust Model. C2PA follows the Public Key Infrastructure (PKI) using your private key and public certificates in the signing process.

https://c2pa.org/

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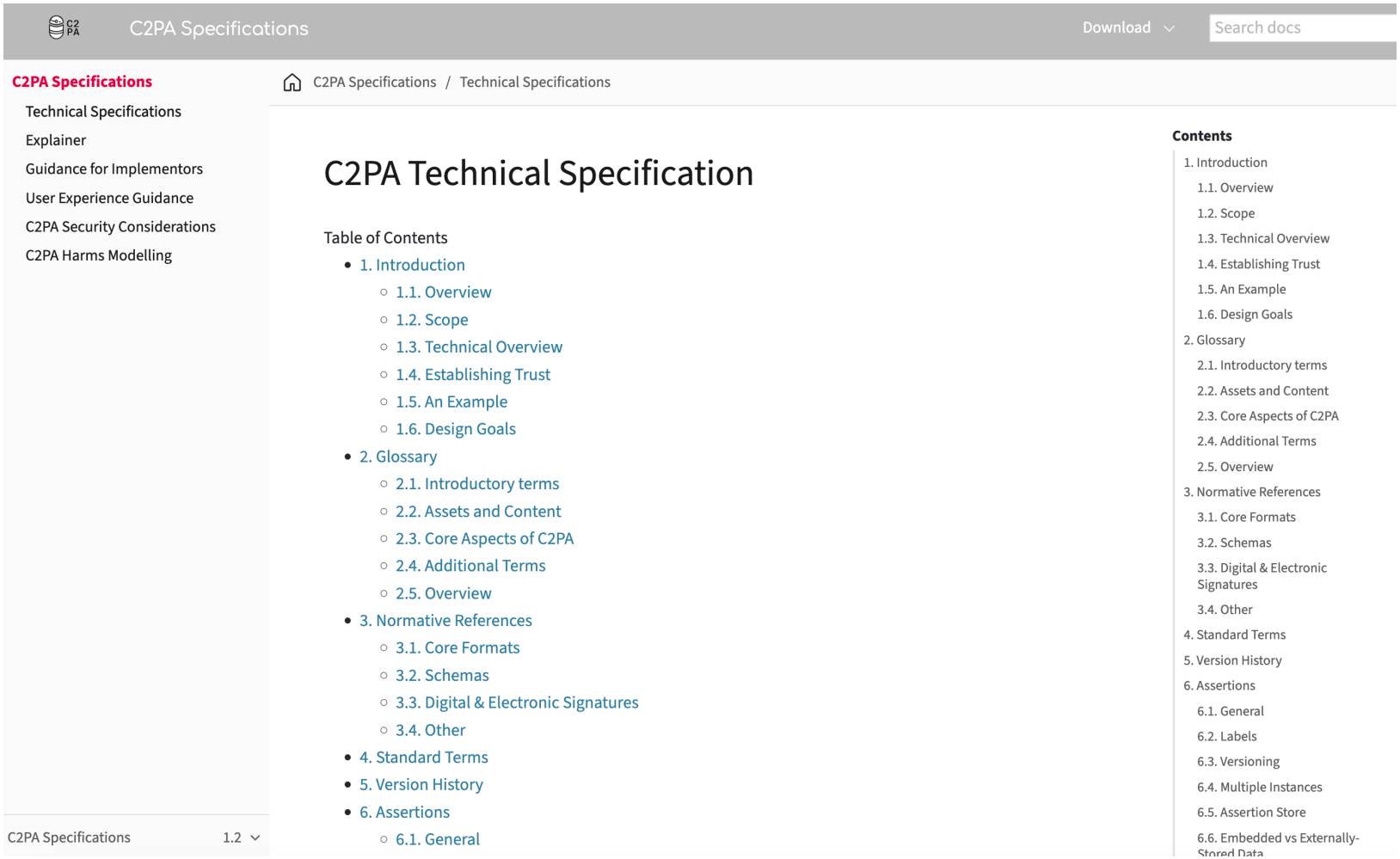

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C2PA Specifications

The Coalition for Content Provenance and Authenticity (C2PA) addresses the prevalence of misleading information online through the development of technical standards for certifying the source and history (or provenance) of media content. C2PA is a Joint Development Foundation project, formed through an alliance between Adobe, Arm, Intel, Microsoft and Truepic.

This site contains the various specifications and documents produced by the C2PA.

- Technical Specifications
- Explainer
- Guidance for Implementers
- User Experience Guidance
- Security Considerations
- Harms Modelling
- Guidance for Artificial Intelligence and Machine Learning

PDF Versions of these documents are also available via the Download button in the page header.

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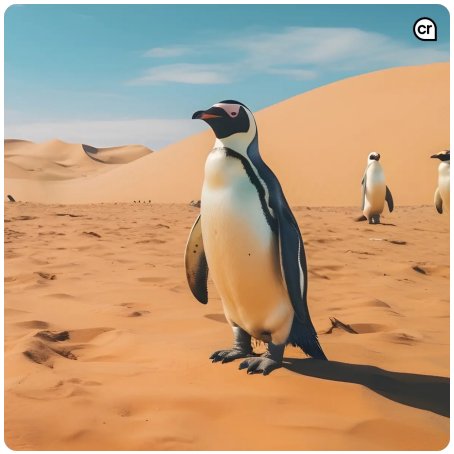
ICON OF TRANSPARENCY

Official Content Credentials "icon of transparency," a symbol that will become the ultimate signal of transparency in digital content.



https://contentcredentials.org/

Truly Open Standards

Content Credentials are based on an open technical specification developed and maintained by the C2PA, a cross-industry standards development organization. You can review the specification anytime.

Clear Tampering Detection

Content Credentials use technology that makes it clear if content has been altered since its Content Credentials were created. Up-to-date context travels with the content, wherever it goes.

Accountability

Devices, software, and organizations that issue Content Credentials identify themselves in the Content Credentials they issue. Issuers therefore stake their reputations on their ability to record information accurately.

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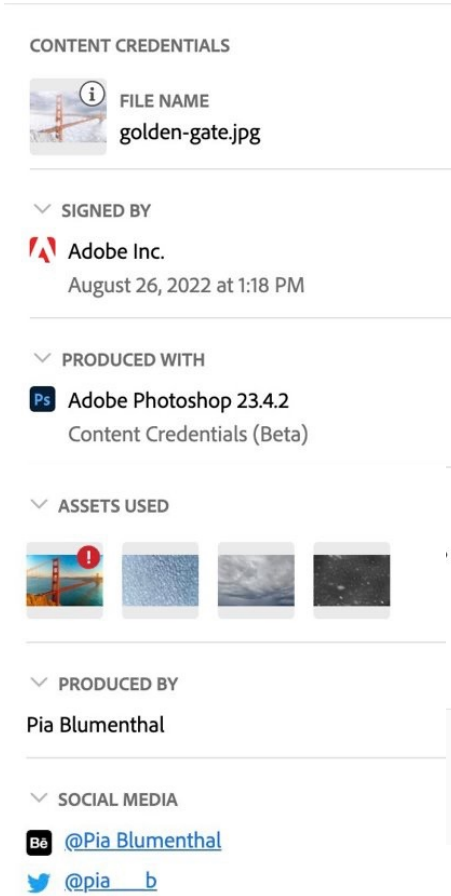
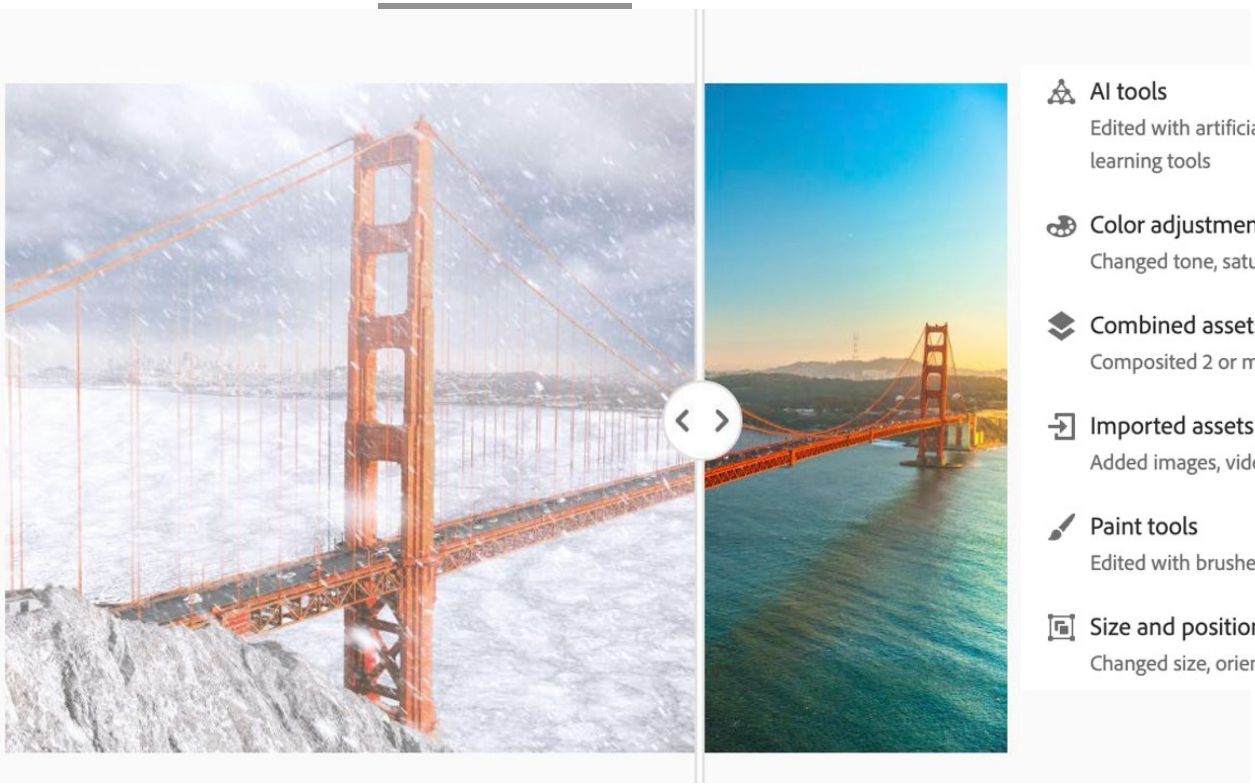
VERIFY





verify.contentauthenticity.org/

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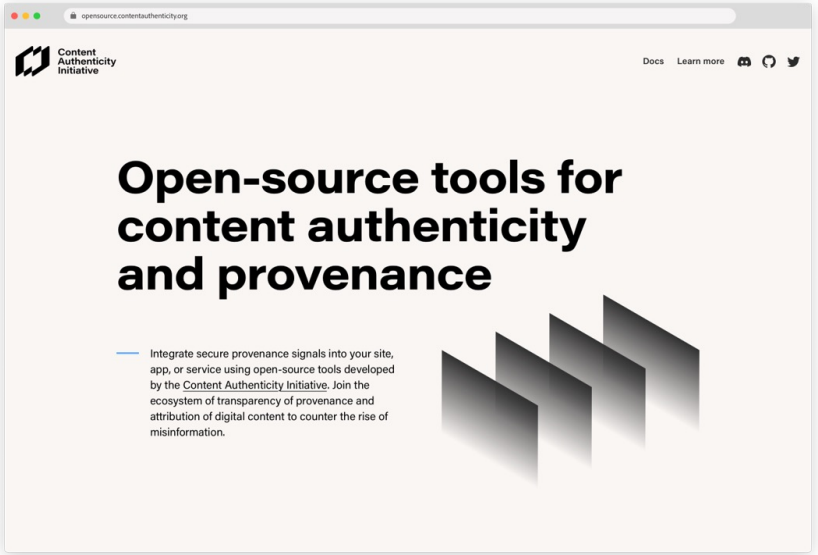
CAI OPEN SOURCE TOOLS

C2PA Tool -- Install this tool to create, verify and explore content credentials on the command line.

JavaScript SDK -- Everything you need to develop rich, browser-based experiences with content credentials.

Rust SDK -- Develop custom applications across desktop, mobile, and services that create, verify, and display content credentials via our Rust library.



Opensource.contentauthenticity.org/

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CAI OPEN SOURCE TOOLS

Implementation	JavaScript SDK	C2PA Tool	Rust SDK
Display C2PA data on your site or app	✓	✓	✓
Link C2PA data displayed on your site to Verify	✓	✓	✓
Write C2PA data into files		✓	✓
Quickly create and inspect C2PA data		✓	✓
Customize displaying and creating C2PA data			✓
Deploy on Web, mobile, and desktop			✓

Opensource.contentauthenticity.org/

- **Creation and signing of C2PA manifests**
- **Embedding manifests in media**
- **Cloud and sidecar manifests**
- **Parsing and validation of manifests**
- **Building trees of ingredient manifests**

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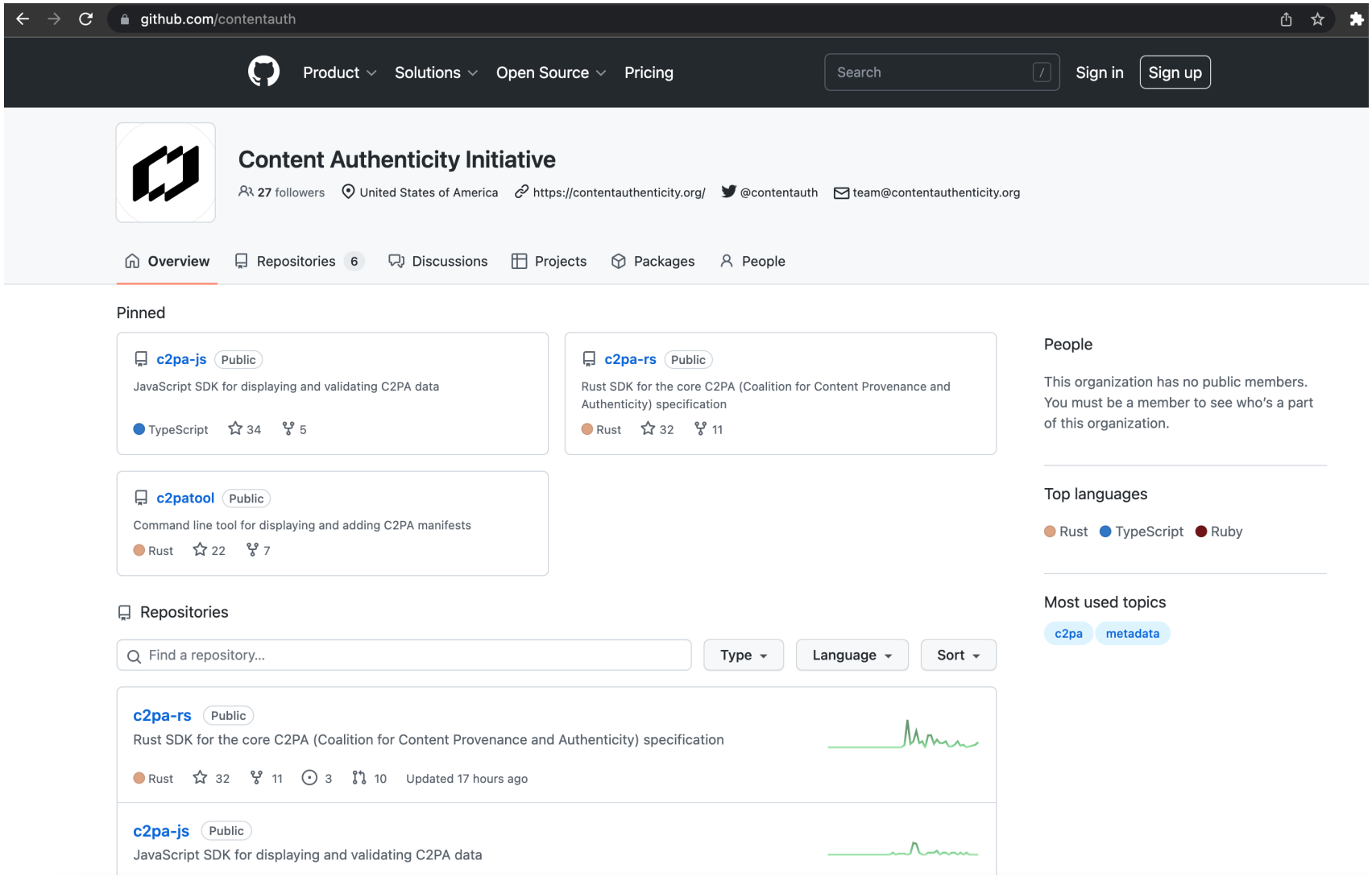

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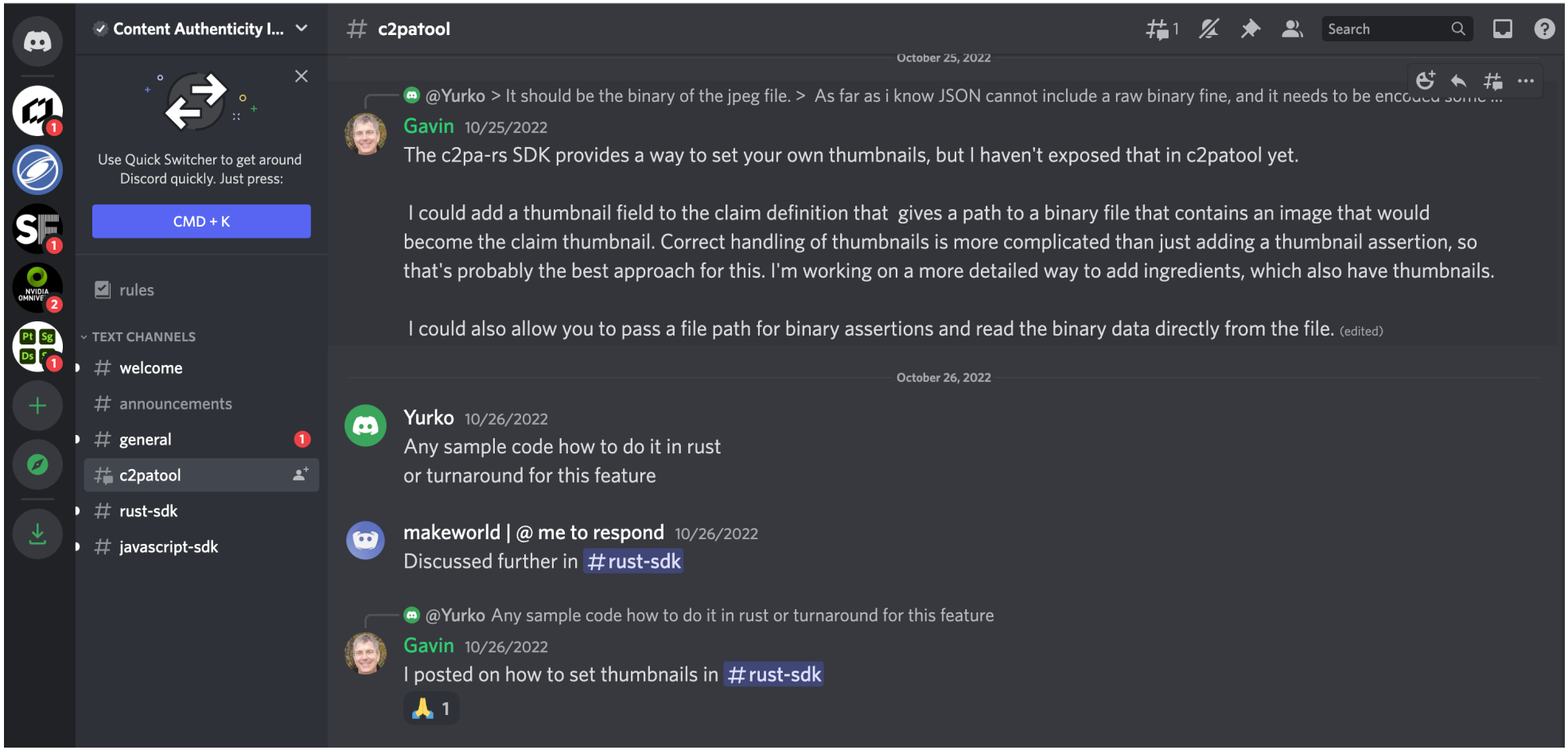
13 Makefile

```
@@ -35,7 +35,6 @@ c2patool-package:
35 35           cp README.md target/c2patool/README.md
36 36           cp sample/* target/c2patool/sample
37 37           cp CHANGELOG.md target/c2patool/CHANGELOG.md
38    -         cp tests/fixtures/IMG_0003.jpg target/c2patool/image.jpg
39 38
40 39   # These are for building the c2patool release bin on various platforms
41 40   build-release-win:
@@ -57,14 +56,14 @@ build-release-linux:
57 56
58 57   # Builds and packages a zip for c2patool for each platform
59 58   ifeq ($(PLATFORM), mac)
60    - c2patool-release: build-release-mac-universal c2patool-package
61    -         cd target && zip -r c2patool_mac.zip c2patool && cd ..
   59 + release: build-release-mac-universal c2patool-package
   60 +         cd target && zip -r c2patool_mac_universal.zip c2patool && cd ..
62 61   endif
63 62   ifeq ($(PLATFORM), win)
64    - c2patool-release: build-release-win c2patool-package
65    -         cd target && tar.exe -a -c -f c2patool_win.zip c2patool && cd ..
   63 + release: build-release-win c2patool-package
   64 +         cd target && tar.exe -a -c -f c2patool_win_intel.zip c2patool && cd ..
66 65   endif
67 66   ifeq ($(PLATFORM), linux)
68    - c2patool-release: build-release-linux c2patool-package
69    -         cd target && tar -czvf c2patool_linux.tar.gz c2patool && cd ..
   67 + release: build-release-linux c2patool-package
   68 +         cd target && tar -czvf c2patool_linux_intel.tar.gz c2patool && cd ..
70 69   endif
```


https://github.com/contentauth/c2patool



https://discord.com/invite/CAI

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CONTENT CREDENTIALS-ENABLED DEVICES

Leica M11-P

Available

SONY

α9 III

Sony a9iii

Preorder…

Nikon z9

Announced In 2022

truepic

C2PA Partner

TRUEPIC LENS

Build your apps on content authenticity Seamlessly integrate Truepic's secure camera technology directly into your existing iOS, Android, or mobile web applications with the Truepic Lens software development kit (SDK).

Truepic Unveils Watershed Gen-AI Transparency Directly on Devices Powered by Snapdragon Mobile Platform

Microsoft adds Content Credentials to AI-generated images in Bing Image Creator

Microsoft announced Content Credentials as a service, part of a sweeping announcement on the company's commitment to protecting elections.

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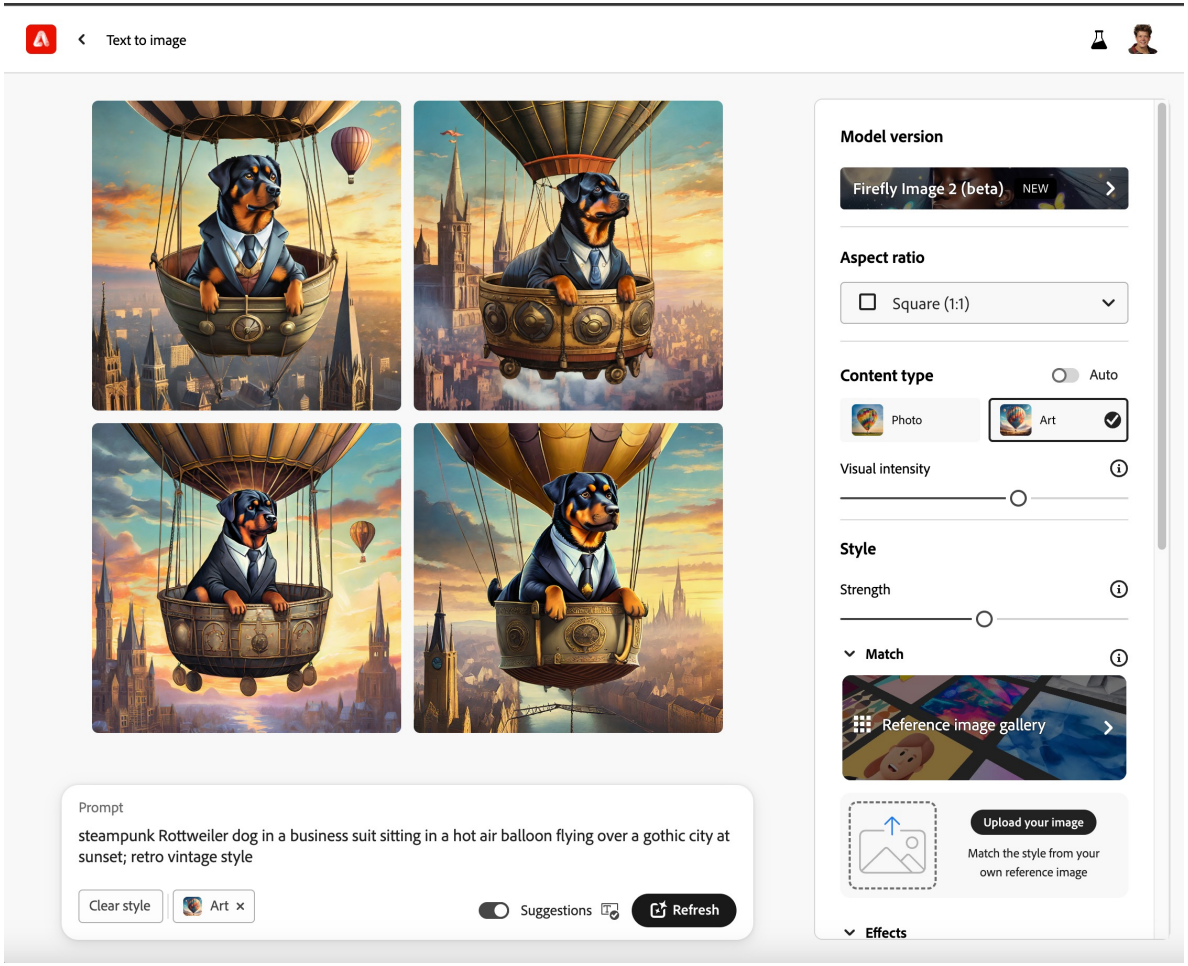
ADOBE FIREFLY



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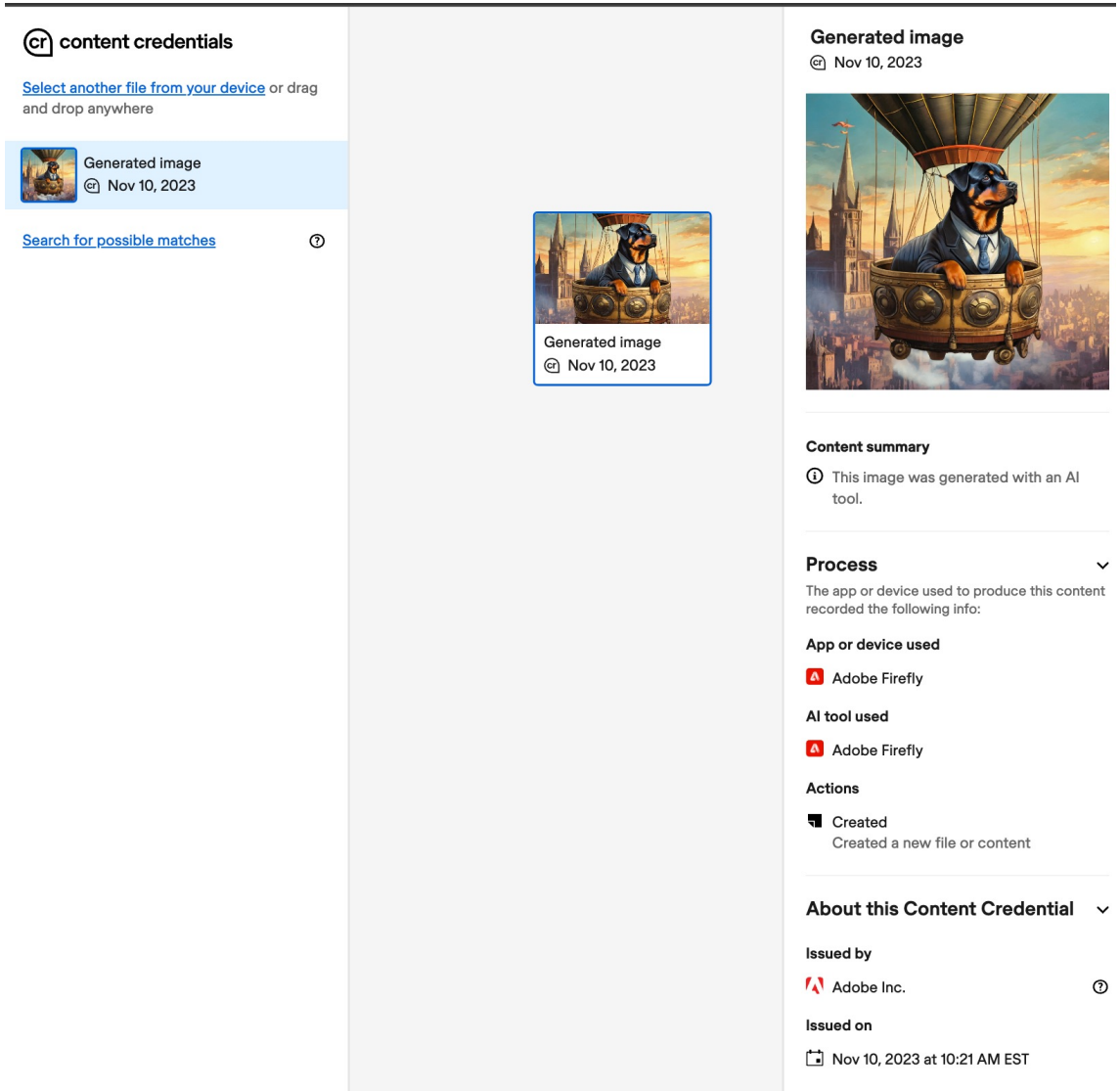
FIREFLY IMAGE IN VERIFY



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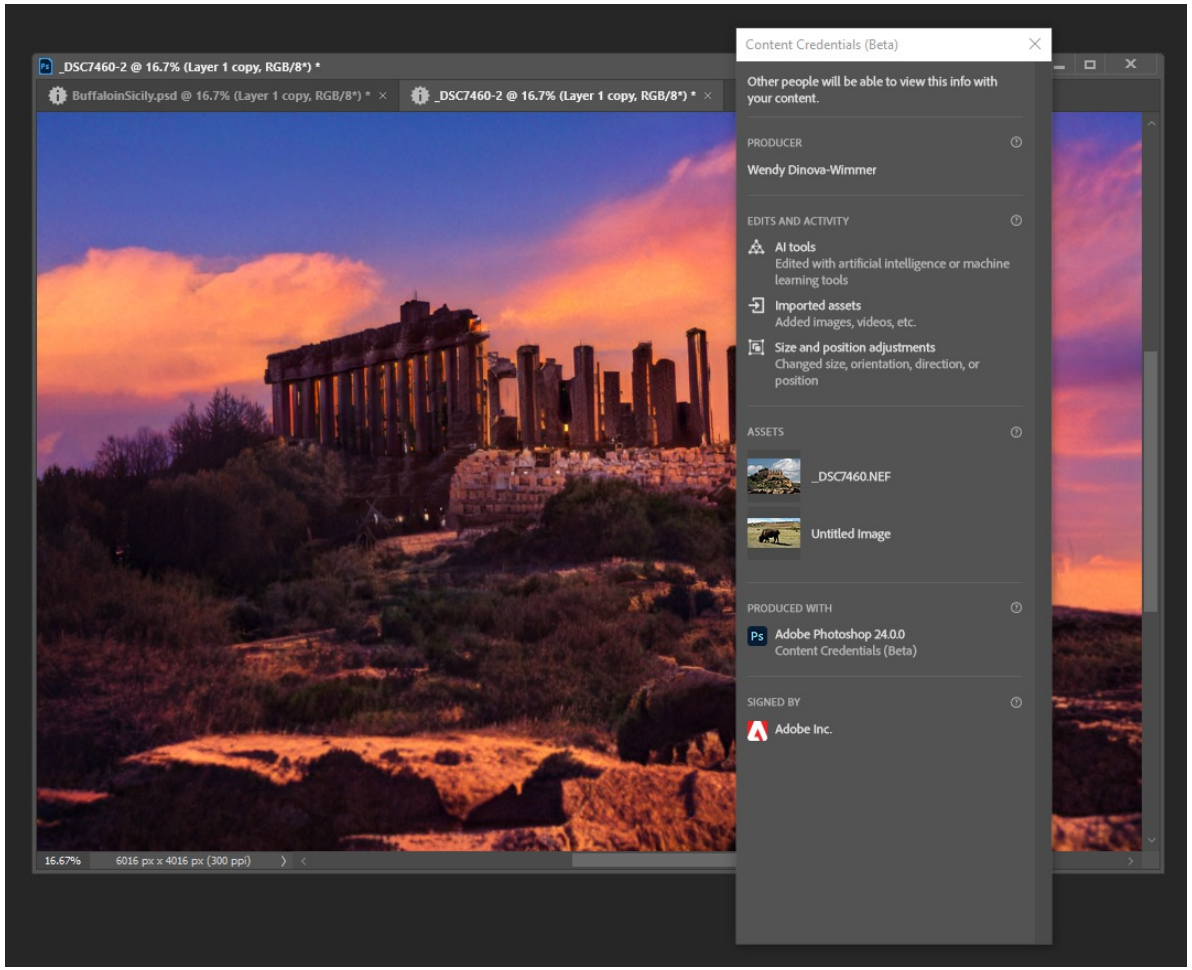
PHOTOSHOP CONTENT CREDENTIALS (BETA)



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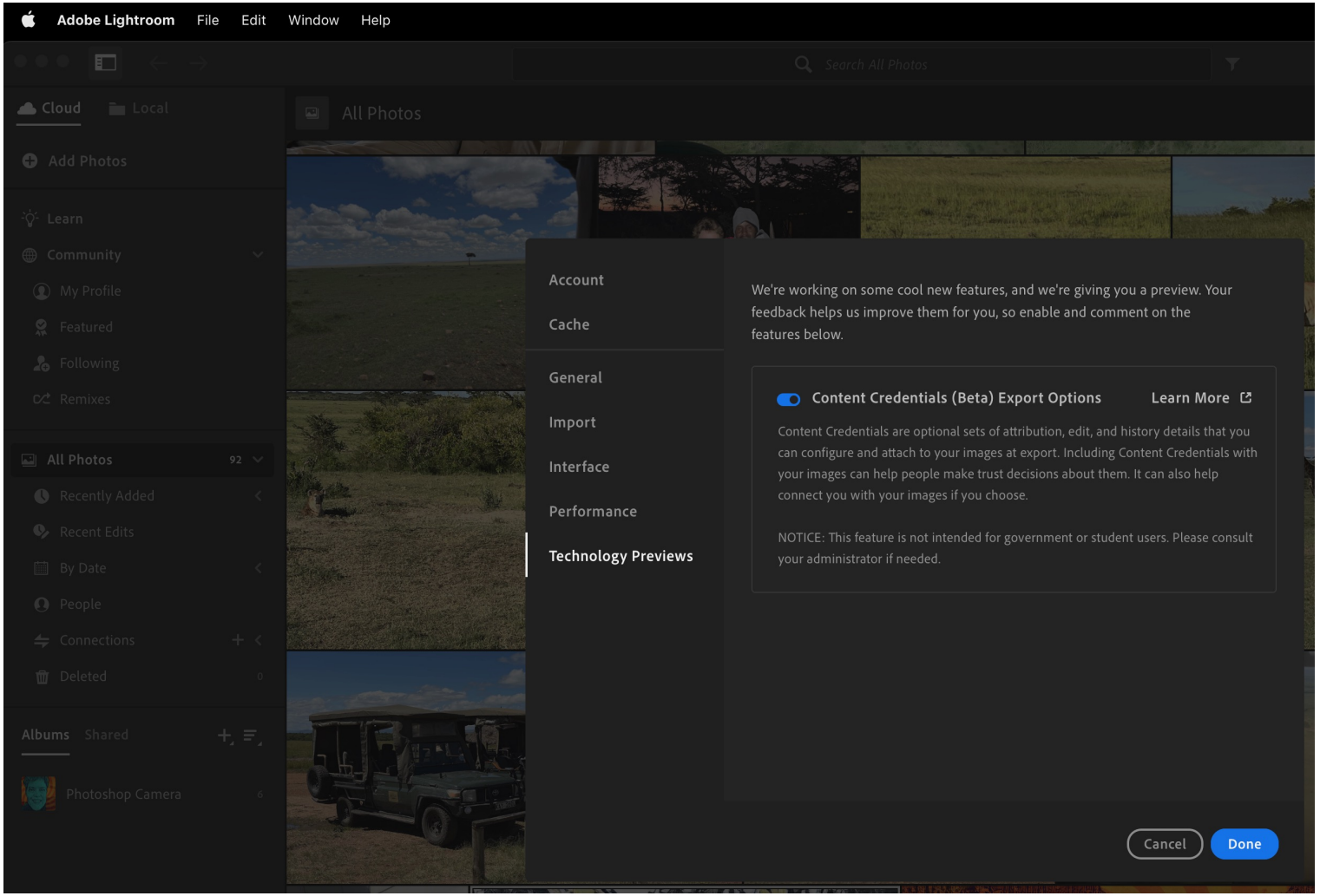

LIGHTROOM

Note: To add RAW files, import our images as DNG. DNG is in the specification

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CAI Media Literacy Curriculum

The Content Authenticity Initiative (CAI) is an Adobe-led community of major media and technology companies (and others) working to combat mis/disinformation by establishing the open-source industry standard for digital content provenance.

https://edex.adobe.com/cai

https://contentauthenticity.org/media-literacy

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Standards About us News Taking part Store Search

ISO/IEC AWI 21617-1

JPEG Trust

Part 1: Core Foundation

Status : **Under development**

General information

Status : Under development
Stage : New project registered in TC/SC work programme [20.00]

Edition : 1

Technical Committee :
ISO/IEC JTC 1/SC 29

RSS updates

ISO: JPG FRAMEWORK

https://www.iso.org/standard/86831.html

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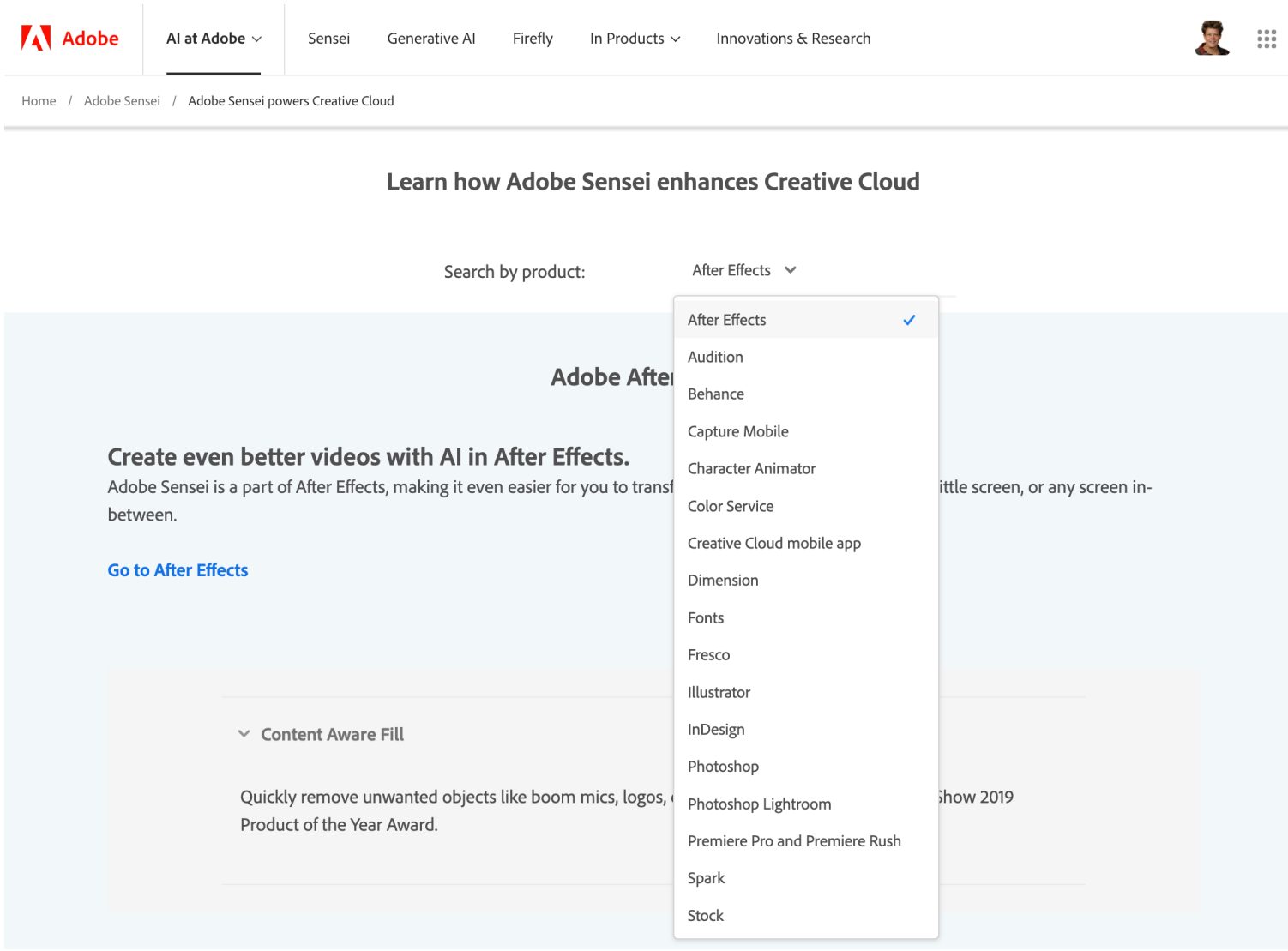

ADOBE SENSEI

https://www.adobe.com/sensei/creative-cloud-artificial-intelligence.html

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THIS IS WHERE WE WANT CAI CONTENT CREDENTIALS

- Provenance starts at the sensor
- But we also have synthetic media—Provenance starts at creations includes training data, 3d objects or other sources
- What about the metaverse?
  —can CAI be used in a virtual world

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PUBLIC SECTOR AREAS OF INTEREST

- **Official Photography**
- **Forensics/Crime Photography**
- **Archival and Historical Collections**
- **Scientific/Research Integrity**
- **Artificial Intelligence Training Data**
- **Overhead Imagery**

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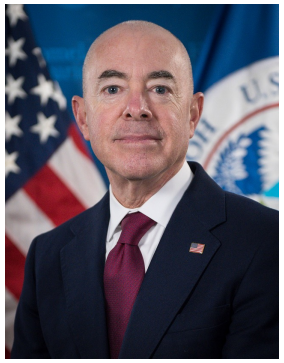

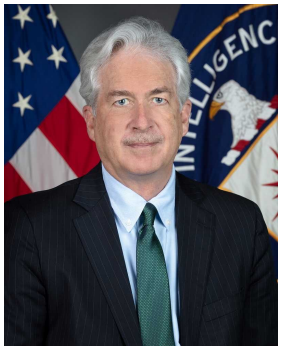

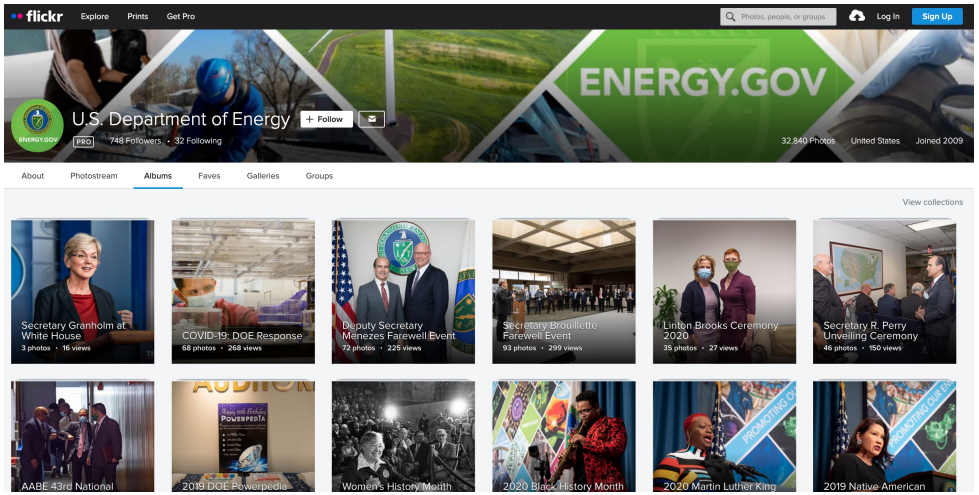

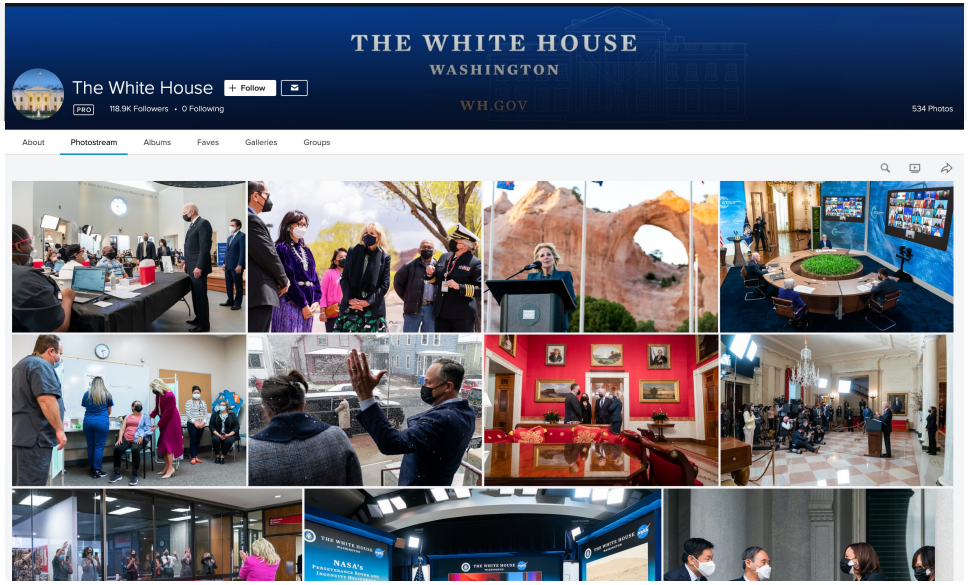

OFFICIAL PHOTOGRAPHY

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FORENSICS/CRIME SCENE PHOTOGRAPHY

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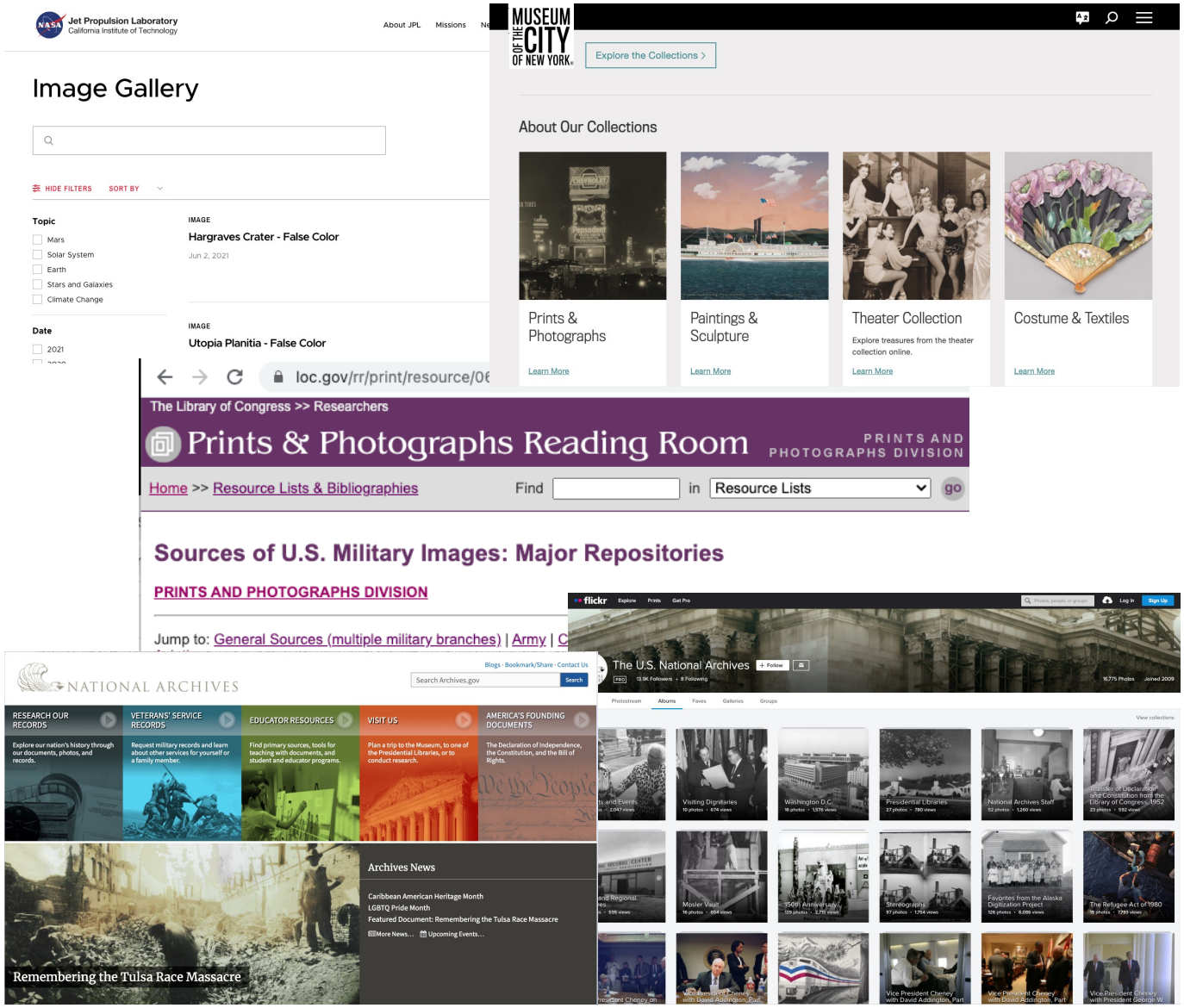

ARCHIVAL AND HISTORICAL COLLECTIONS

- National Archives
- Library of Congress
- Agency Libraries
- Smithsonian
- Federal, State and Local Museums

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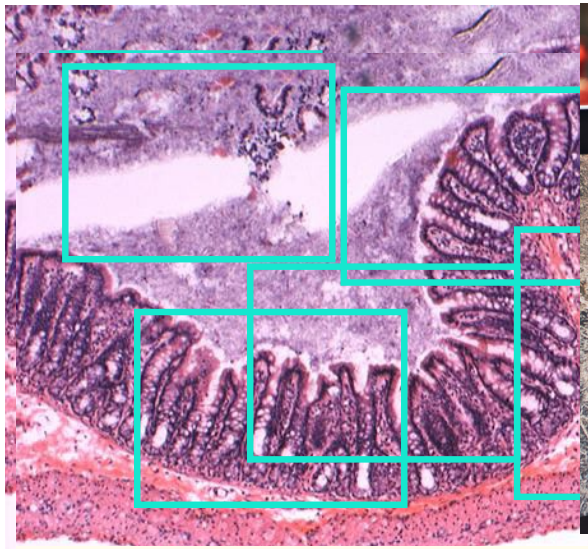
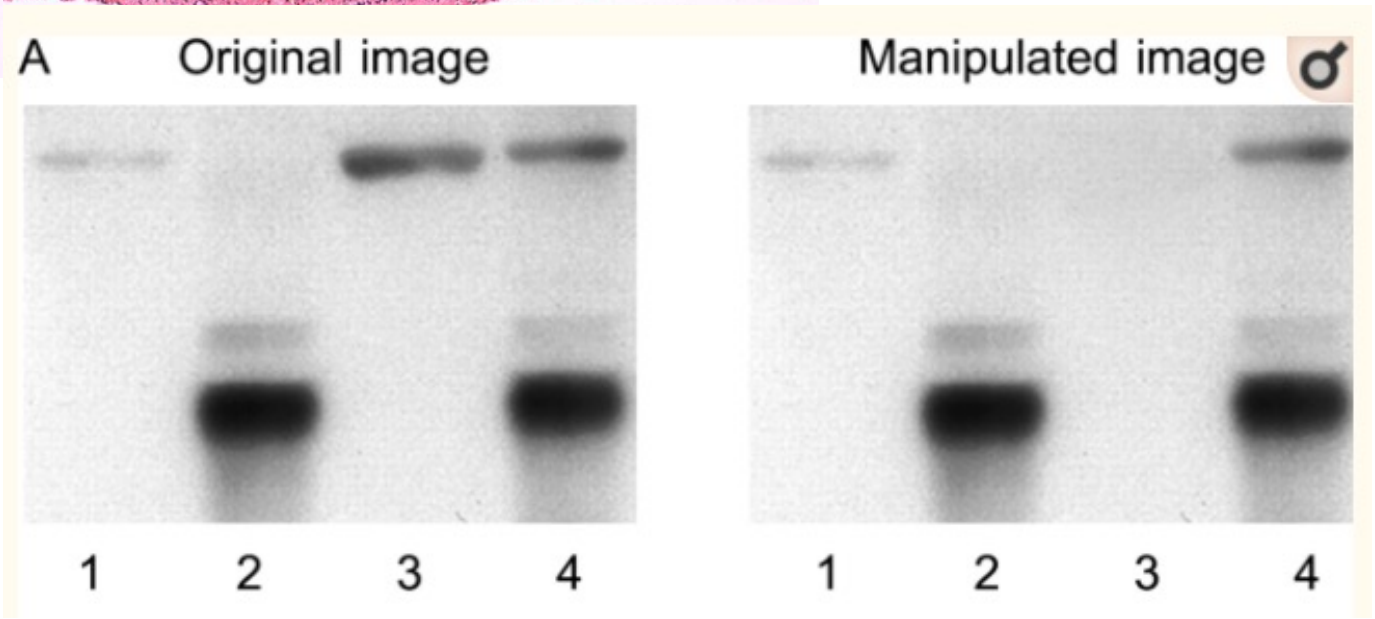


SCIENTIFIC/RESEARCH INTEGRITY



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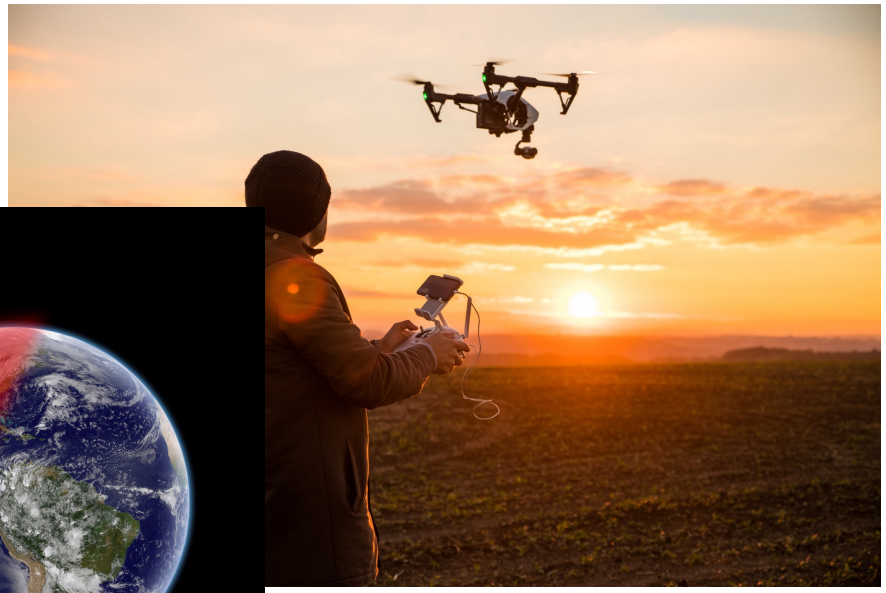

OVERHEAD IMAGERY

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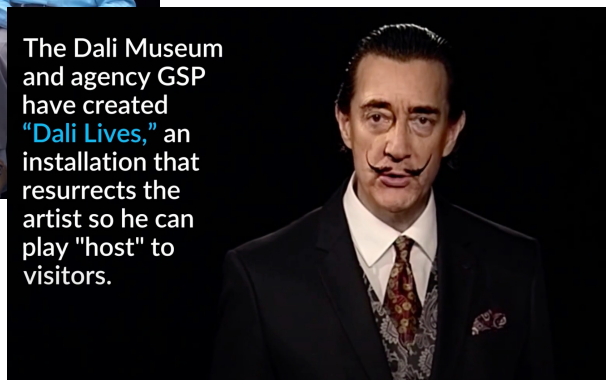
The Dali Museum and agency GSP have created "Dali Lives," an installation that resurrects the artist so he can play "host" to visitors.



SPECIAL COLLECTIONS

What type of attribution should be used for manipulated images, audio and videos?

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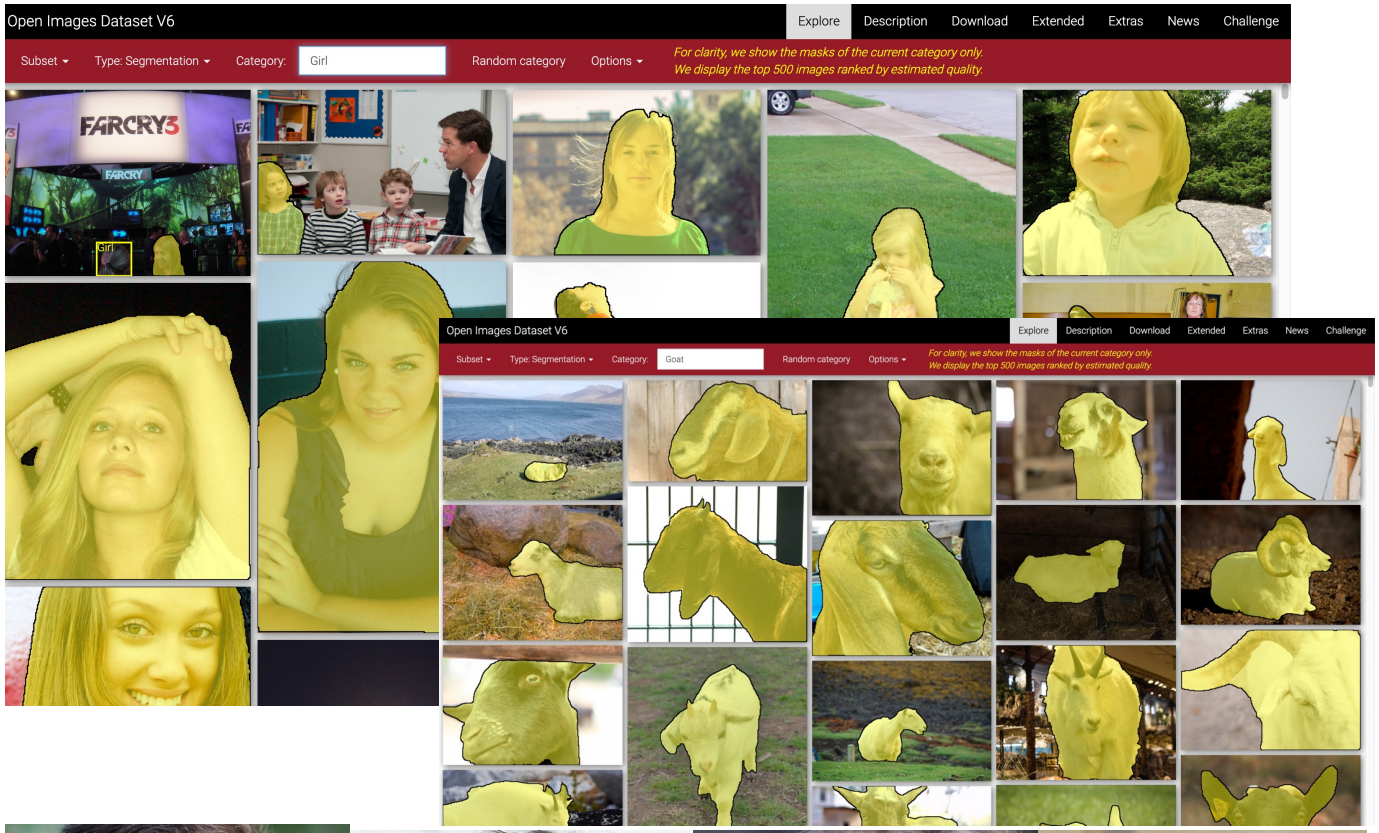

ARTIFICIAL INTELLIGENCE TRAINING DATA

- All Levels of Government
- Universities/Researchers

These faces are from https://thispersondoesnotexist.com/

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YOUR ROLE—BUILD OR ANALYZE TRANSPARENCY

Do you own the images?

Are you analyzing the images?

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CAI/C2PA References *(as of 11 November 2023)*

Important CAI/C2PA Websites

https://contentauthenticity.org/

https://contentcredentials.org/

https://c2pa.org

https://contentauthenticity.org/media-literacy

https://blog.adobe.com/en/publish/2023/10/10/new-content-credentials-icon-transparency

https://edex.adobe.com/cai

https://helpx.adobe.com/photoshop/using/content-credentials.html

https://helpx.adobe.com/lightroom-cc/using/content-credentials-lightroom.html

Content Credential-Enabled Devices

Nikon (2022 announcement)
https://blog.adobe.com/en/publish/2022/10/18/major-steps-forward-cai-partnerships-leica-nikon-new-content-credentials-features-photoshop-beyond-max-2022

Sony Alpha 9 iii
https://www.prnewswire.com/news-releases/sony-electronics-releases-the-alpha-9-iii-the[...]l-frame-camera-with-a-global-shutter-systemi-301980040.html

Leica M11-P
https://leica-camera.com/en-US/photography/content-credentials

Truepic Lens
https://truepic.com/a-case-study-in-c2pa-interoperability/

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REFERENCE PDF

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EXCERCISE

Grab a slip a paper and answer these questions them put away.

Original question:

What do you think synthetic media will be in 5 years?

2 years, 1 year, 6 months or 3 months?

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THANK YOU

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