



International Image Interoperability Framework

Instituto Centrale per il Catalogo e la Documentazione
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Tom Cramer
Chief Technology Strategist
Stanford University Libraries

 @tcramer | @iiif_io

Global

International Image Interoperability Framework

**Image-based
resources:
books, images,
newspapers,
manuscripts,
scrolls, maps,
music, art,
audio-visual
et al.**

**Mutually
usable;
simpatico**

**APIs
Software
Content
Community**

Images are fundamental information carriers for cultural heritage



...day was a big flappy Me
overanxious to please.
XXXXXXXXXXXXXXXXXXXXX sev
another wild day began.
...dy did the explaining--
He stank. I found out w
truck. Freddy always ha
about things. He always
go!" And he went. He



But image delivery on the Web is...

<http://www.loc.gov/pictures/resource/fsac.1a34206/>



- hard
- slow
- expensive
- disjointed
- locked up
- *siloes*



Capabilities

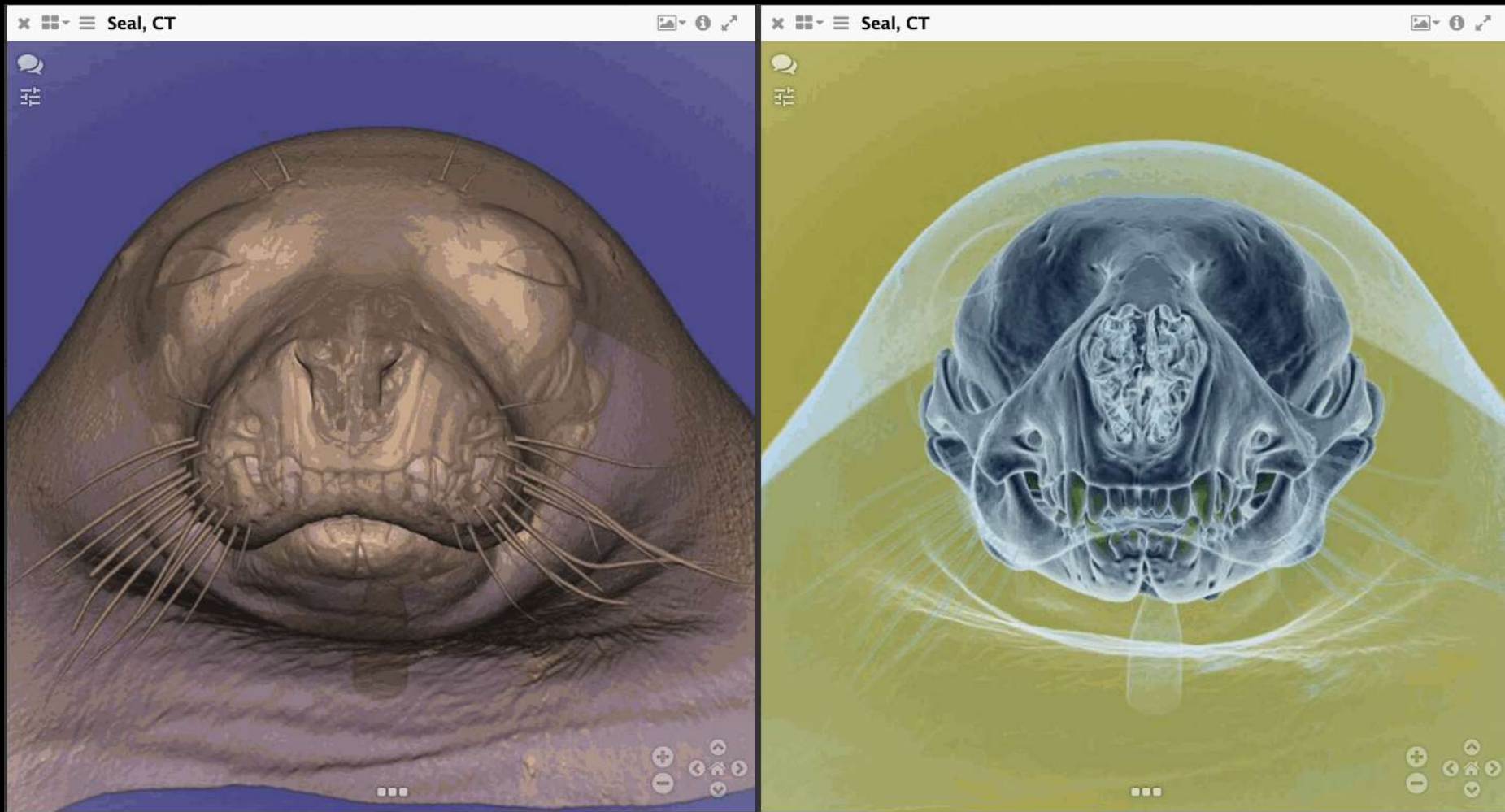
Deep zoom with large images



Cite and share (even regions of interest)



Compare images



Computed Tomography (CT) scans of the head of a seal from the Wellcome Library

<https://wellcomelibrary.org/item/b20433141> | <https://wellcomelibrary.org/item/b2043313x>

Across sites

The screenshot shows the Digital Bodleian website. The main content is a large, colorful circular game board titled "Historical pastime or a new game of the...". The board features concentric circles of small portraits and text, with a central portrait of a man. To the right of the board is a "METADATA" sidebar with the following information:

- ID: 32bb9aa4-43ce-4bf7-b0fb-c9452ca8e40c
- Title: Historical pastime or a new game of the history of England from the Conquest to the Accession of George the Third
- Creator: Harris, J. [author] | Wells, J. [author]
- Format(s): single sheet, 506 x 403 mm
- Date: 1803-12-01
- Language: English
- Alternative title: New game of the history of England from the Conquest to the Accession of George the Third | Hastings | W1-1066 | Britain | Norman | Doomsday book | New Forest | Holy Land | 966, 1067 | Robert D. of Normandy | Royal Forest | Death of Wm. (I) 1100 | Henry seizing his brother's treasure | Anselm | W11 | B. 1138 | War. Madria | H.J. 1184 | Bocket assassinated by four barons
- Collection: Ephemeris
- Description: Game of 1803 entitled Historical pastime or a new game of the history of England from the Conquest to the Accession of George the Third | has 150 circles, each depicting an aspect or event of history. The first twenty are indexed, see examples
- Source: bodp001-ay-0001-0
- Rights: <http://nvalivecommons.org/collections/ncsa/3/0/>
- Permissions: <https://digital.bodleian.ox.ac.uk/inquire/p/32bb9aa4-43ce-4bf7-b0fb-c9452ca8e40c>

At the bottom of the page, there are navigation links: Bodleian Libraries | University of Oxford | Powered by Arandis Systems | About | Privacy | Accessibility | Terms & Conditions | Staffmark Index

The screenshot shows the Stanford SearchWorks catalog. The search results page displays a record for a resource related to Shakespeare. The record title is "Shakespeare, William". Below the title is a thumbnail image of a portrait of William Shakespeare, with the text "W. SHAKESPEARE" visible below the portrait. The page includes a search bar at the top with "All fields" and "books & media" selected. The Stanford Libraries logo is in the top left corner, and "Login My Account Feedback" links are in the top right. A "Menu" button is visible on the left side of the page.

Shakespeare-related resources from Oxford, Stanford & Yale

<https://digital.bodleian.ox.ac.uk/inquire/p/32bb9aa4-43ce-4bf7-b0fb-c9452ca8e40c>

<https://searchworks.stanford.edu/view/zj784pt2430> | <http://collections.britishart.yale.edu/vufind/Record/1667254>

Collect items that belong together



Le manuscrit 5 de la
Bibliothèque municipale de
Châteauroux, c. 1460

Folio in BVMM
Miniature in the BNF



Reunify

Biblissima^{li} PROJET Outils DEMOS DOC

Demos^{li} f t u r

Proto-BBMN 1713 Prototype Bibliothèque de Florus **Grandes Chroniques de France** Mirador Atelier RDF/SPARQL 2014

A propos Afficher les miniatures

[Mort de Gondovald. Entretien entre Gontran et Childebert]

<http://demos.biblissima-condorcet.fr/chateauroux/demo/>

Search within

Bookmark

Change Layout

El Paso herald. (1915-04-14)



IS CONFIDENT

Higher Officials Feel No Misgivings, Despite the Army's Great Setbacks.

Vienna, Austria, April 14.—Not the slightest doubt concerning a final victory in the

in the minds of Austria-Hungary's statesmen. The correspondent of the Associated Press, in more than a month's stay here, has interviewed many of the leaders of the dual monarchy. All seem supremely confident, despite the enormous setbacks which the empire's armies have received.

"Eight months of war also have proved that all know how to fight and the soldiers of all nationalities have

AGAIN

Three Alamogordo Juries Refuse To Impeach Talley For Murder

TWO JURIES GIVE PORTER CLEAR

Third Grand Jury

Page 1 Page 2 Page 3 Page 4 Page 5 Page 6 Page 7 Page 8 Page 9 Page 10 Page 11 Page 12

Analyze

The screenshot displays the Georeferencer web application interface. At the top, there is a navigation bar with the following elements: a logo, the text "Georeferencer", and tabs for "Georeference", "Visualize", "Accuracy", and "This map". A "Sign in" button and a user profile icon are also present.

Below the navigation bar, there is a control area with the text "2D / 3D / Side-by-side" and a small thumbnail of a map labeled "Stanford's map of Scotland." To the right of this thumbnail is a horizontal slider and a double-headed arrow icon. A text box to the right of the slider contains the instruction: "Select this slot and then select map from the sidebar (or simply drag the map here)."

The main map area shows a satellite view of Scotland and surrounding regions. A historical map is overlaid on the satellite view. The historical map is titled "SCOTLAND" and shows a detailed topographical and political map. The overlay is controlled by a toolbar at the top of the map area, which includes buttons for "Affine", "Polynomial", "TPS", and "Cutline". A "Mapa" button and a "Satelitni" button are also visible.

On the left side of the map, there is a vertical zoom control with a plus sign at the top and a minus sign at the bottom. A compass icon is located at the top left of the map area.

At the bottom of the map, there is a copyright notice: "Data map ©2014 GeoBasis-DE/BKG (©2009), Google | Podminky pouziti".

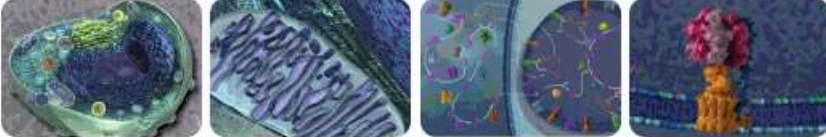
Annotate

← ↻ 🏠 [Secure https://courses.edx.org/courses/course-v1:HarvardX+MCB64.1x+2T2016/d16e07a5cec442eeb7cd9dfcb695dce0/](https://courses.edx.org/courses/course-v1:HarvardX+MCB64.1x+2T2016/d16e07a5cec442eeb7cd9dfcb695dce0/) 🔑 🚀 🗑️ 🖨️ 🌐 📧 📅 📱

Course CellXplorer Syllabus and FAQs


CellXplorer is an interactive and annotated graphic that you can navigate. You can click on the buttons below to zoom in. As each week's content becomes available, you can also navigate to the lesson associated with that part of the cell! The graphic below can sometimes take some time to load.

Support



Show Annotation List

CellXplorer (eukaryotic and prokaryotic cells) ⓘ



Crowd Source

toggle annotations



Name

Name for this person

Charlotte

Date of Birth

Date of Birth of the person identified.

27/07/1965

Occupation

Job title or occupation for the person identified

Teacher

Description

Description of the person identified

Charlotte was 14 in this photo but grew up to be the local teacher

Enrich



Mirador instances on display at McMullen Museum, Boston College.

All with the application of your choice



Mirador



Universal Viewer



IA Book Reader



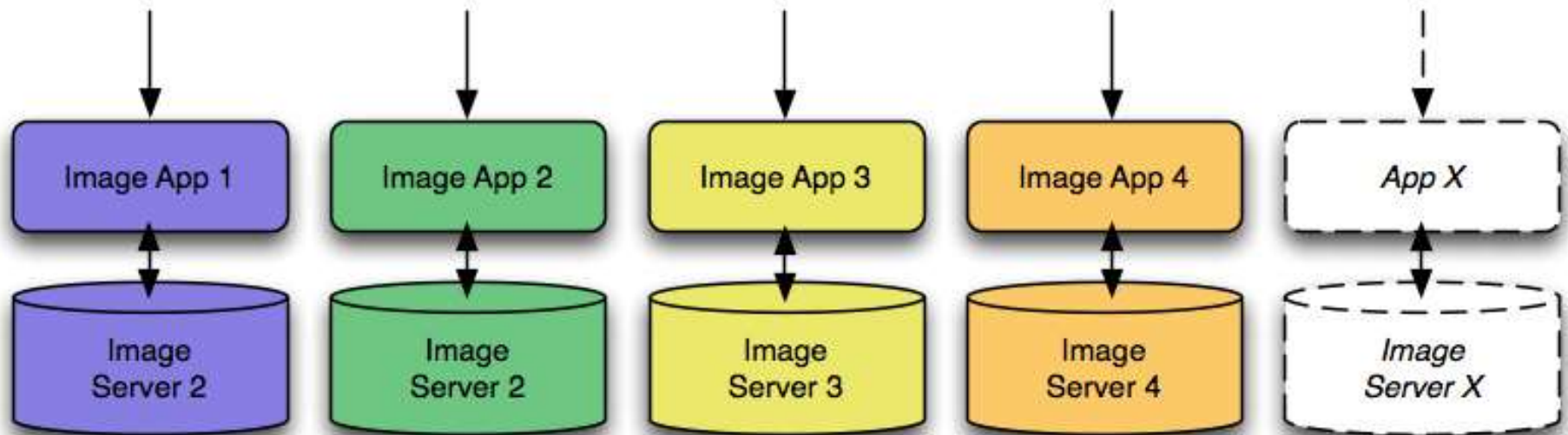
Qatar Digital Library
Archival papers shown in 4
different viewers.

<http://labs.cogapp.com/iiif>



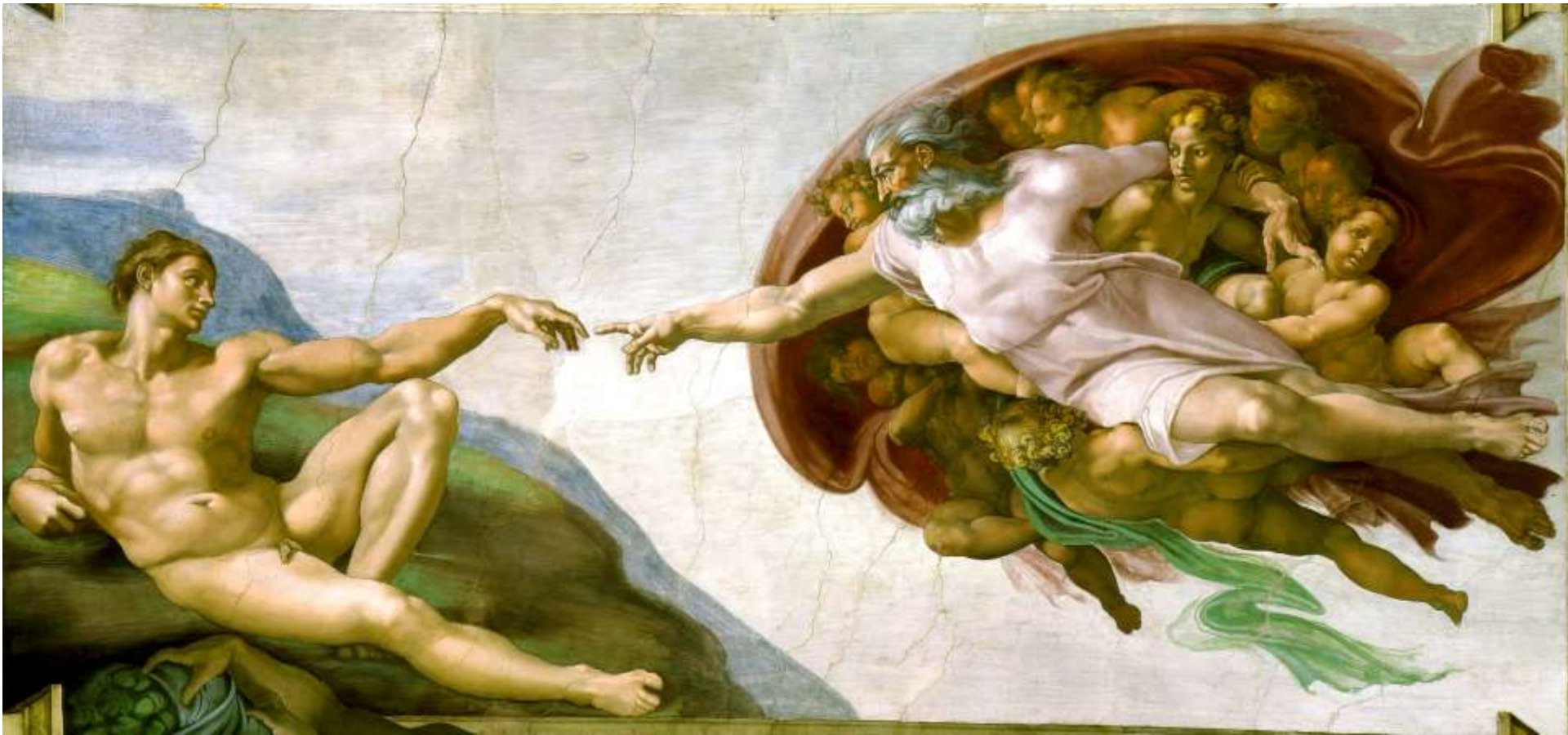
How Does IIF Work?

A world of silos & duplication



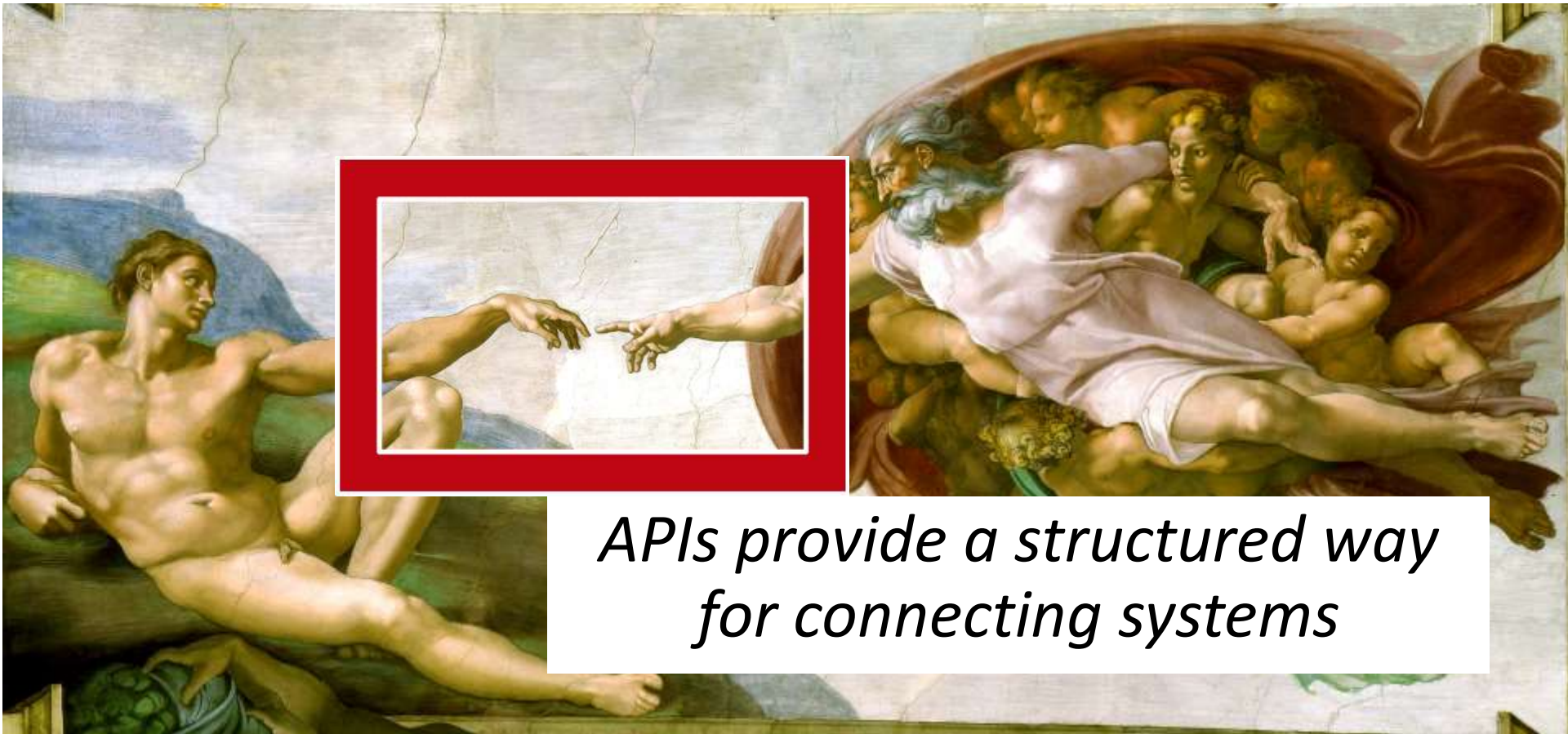
- Every site a silo (→ no interoperability)
- Every app a one-off (→ overhead to code and keep)
- Every user forced to cope (→ many UIs, little integration)

Application Programming Interfaces



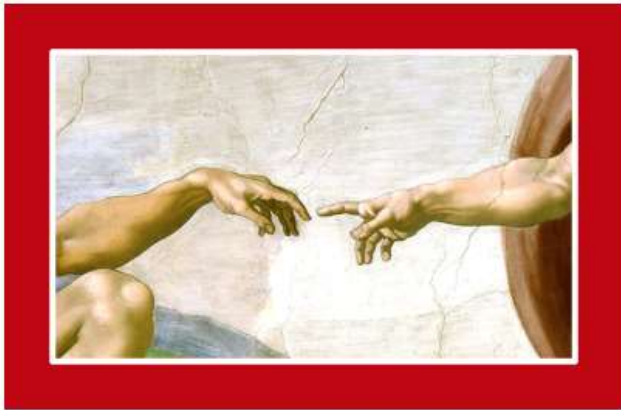
https://commons.wikimedia.org/wiki/File:Creaci%C3%B3n_de_Ad%C3%A1m.jpg

Application Programming Interfaces



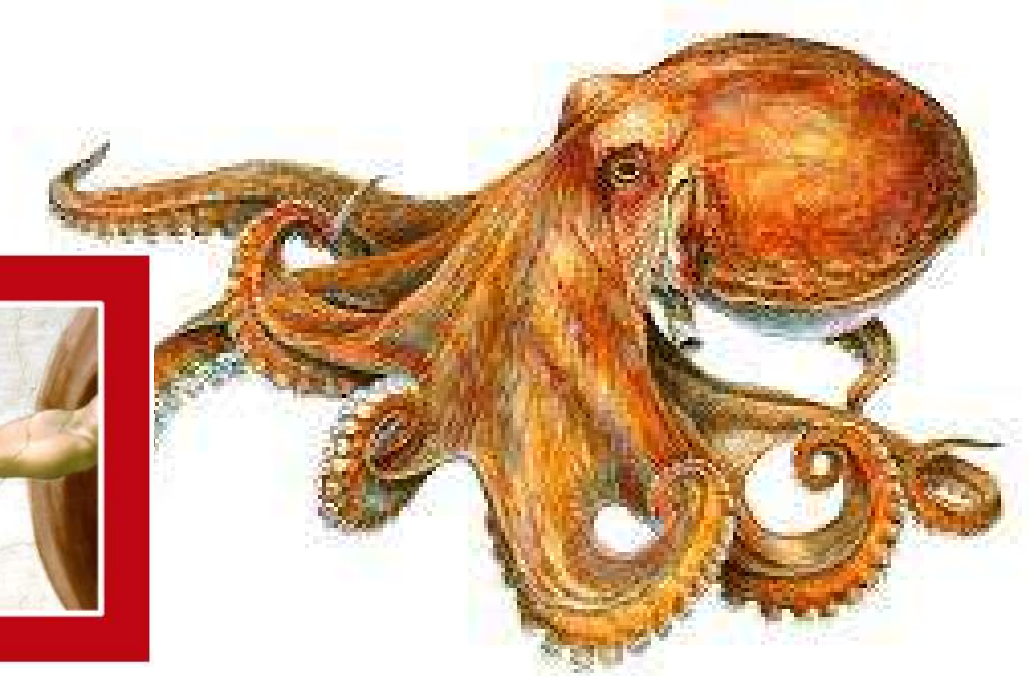
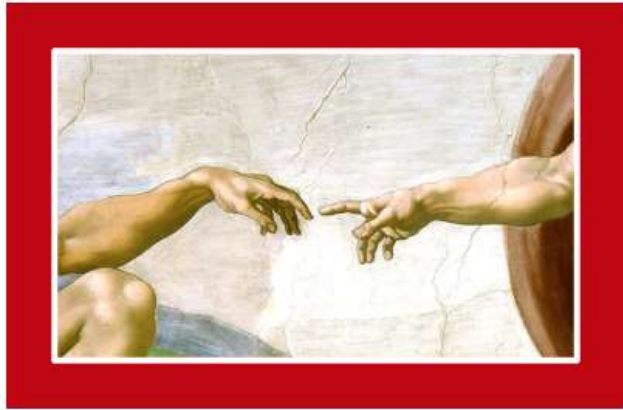
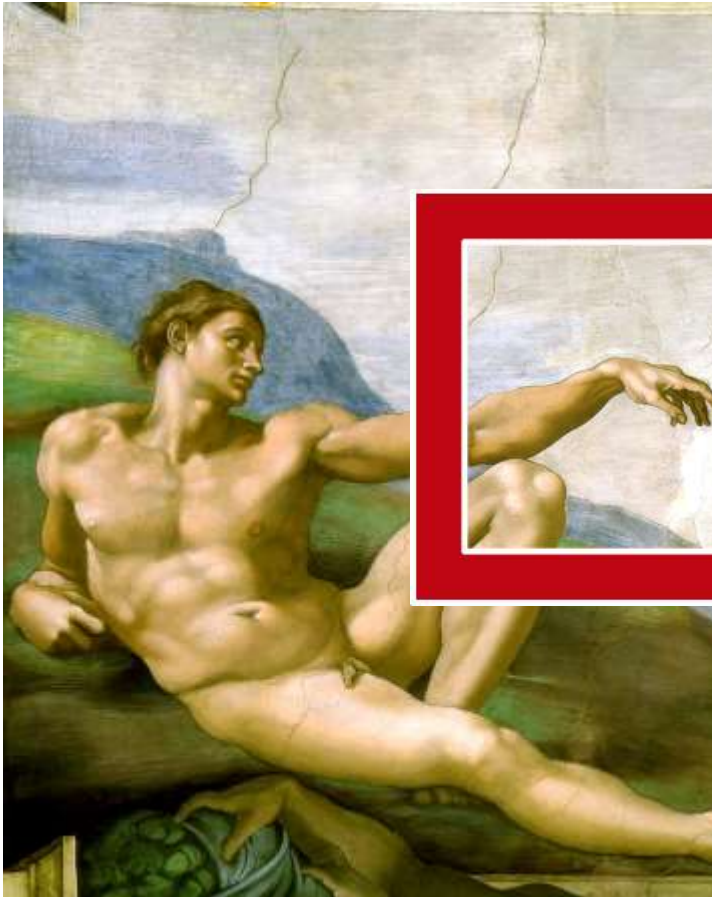
*APIs provide a structured way
for connecting systems*

Application Programming Interfaces

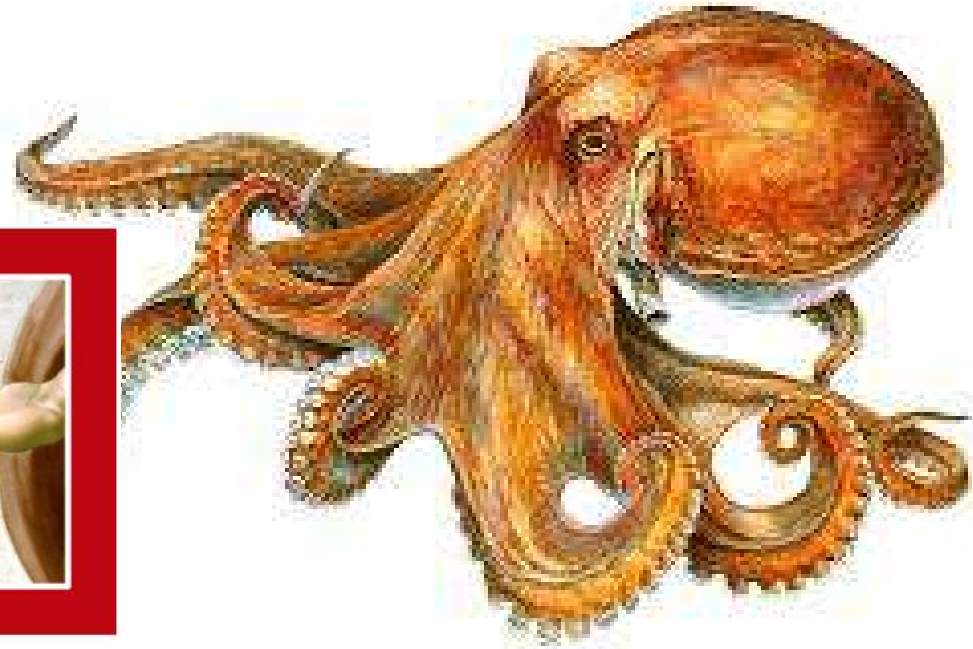
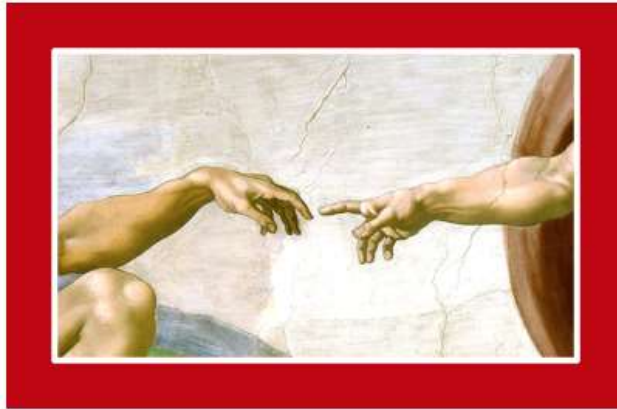


https://commons.wikimedia.org/wiki/File:Creaci%C3%B3n_de_Ad%C3%A1m.jpg

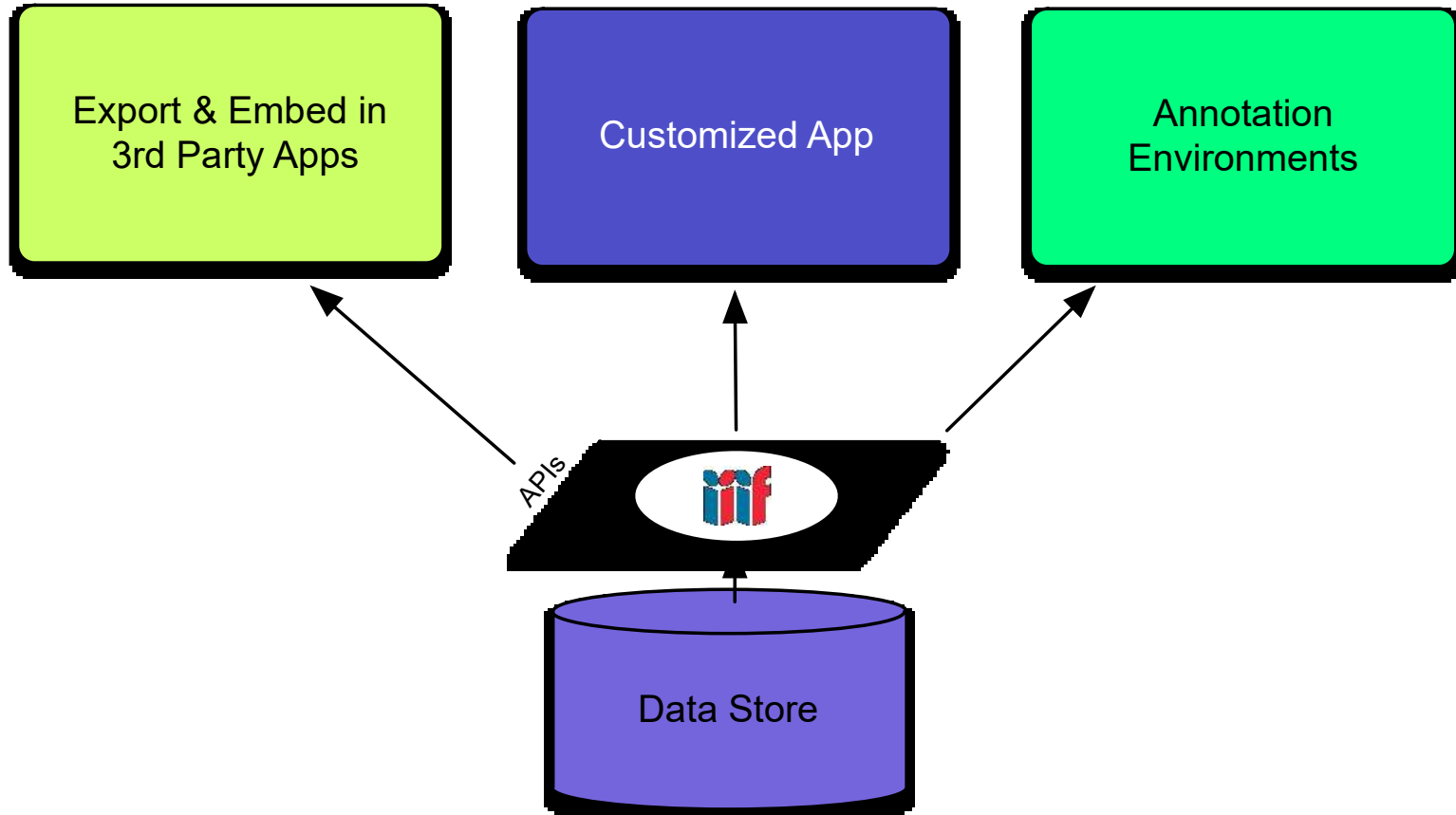
Application Programming Interfaces



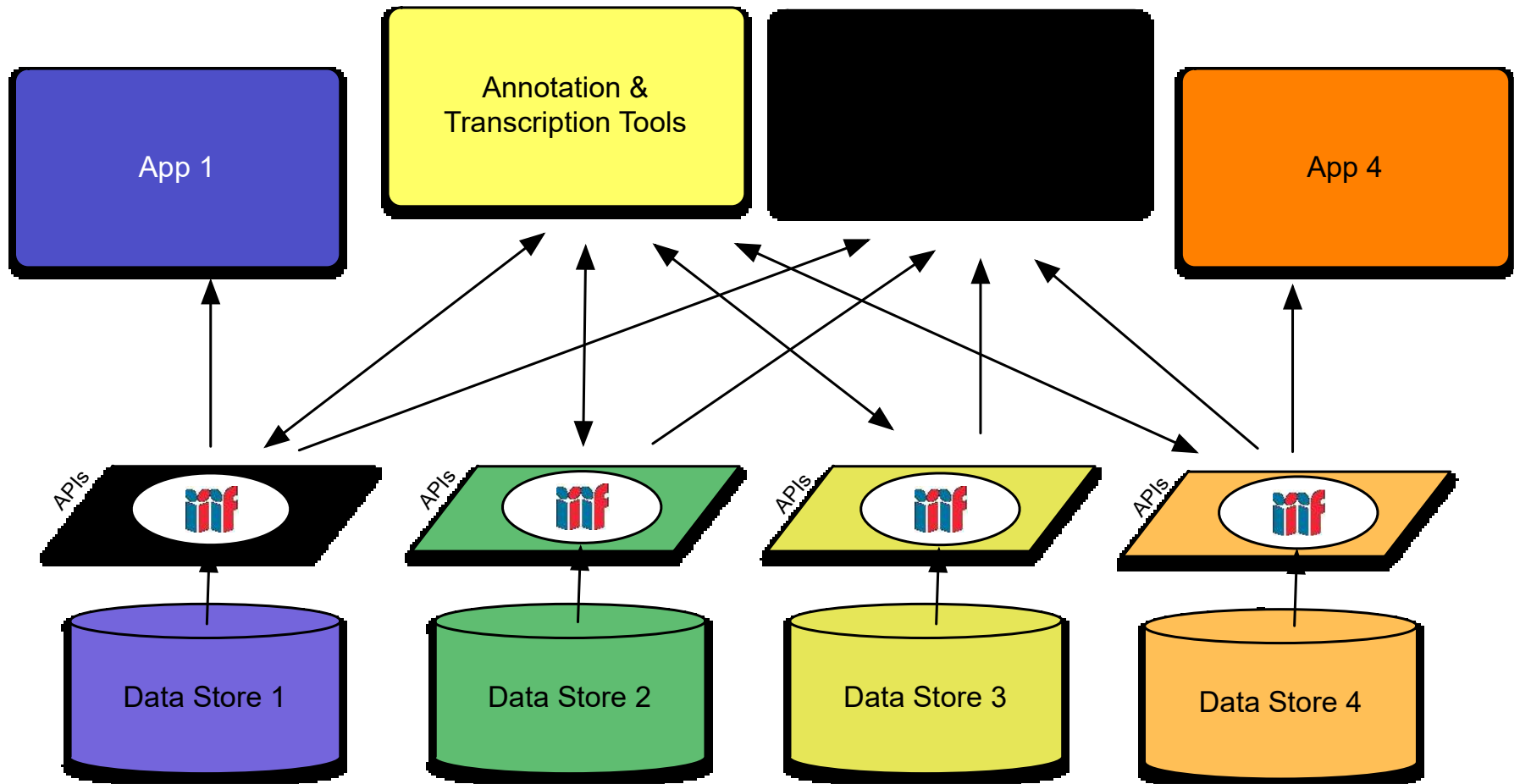
Application Programming Interfaces



APIs enable reuse



APIs -> Framework -> Ecosystem



IIIF Vision

Create a global framework by which image-based **resources** (images, books, maps, scrolls, manuscripts, musical scores, videos, etc.)

...from **any** participating institution can be delivered in a standard way

...via **any** compatible image server

...for display, manipulation and annotation in **any** application,

...to **any** user on the Web.

IIIF Vision, continued

- with **tens of millions** of image-based resources
- backed by a consortium of **world-leading cultural heritage and research institutions**
- supported by a rich and growing suite of **software tools**
- incorporating the **best of current image delivery technology**, and **leveraging Web standards**



So What Is IIIF?



A Community
that develops **Shared APIs**,
implements them in **Software**,
and exposes interoperable **Content**



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IIF is a Global Community



International Leaders

Museums / Galleries

British Museum
National Gallery of Art
The J. Paul Getty Trust
The Walters Art Museum
Yale Center for British Art
Et al.

Aggregators

ARTstor
CONTENTdm
DPLA
Europeana
Internet Archive
Wikimedia Foundation

State / National Libraries

Austria
Bavarian State
British Library
Denmark
Egypt
France
Israel
Japan
Moravian Library
New Zealand
Norway
Poland
Scotland
Serbia
Wales
Qatar
United States (LoC)
Vatican

Universities and Research Institutions

Cambridge
Cornell
Ghent
Gottingen
Harvard
Oxford
Princeton
Stanford
Edinburgh
Toronto
Wellcome Trust
Yale

And many more!

Institutions AND Individuals



IIIF Working Group Meeting, New York, May 2016



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IIIF: Two Core APIs



Image API

“get pixels” via a simple, RESTful, web service

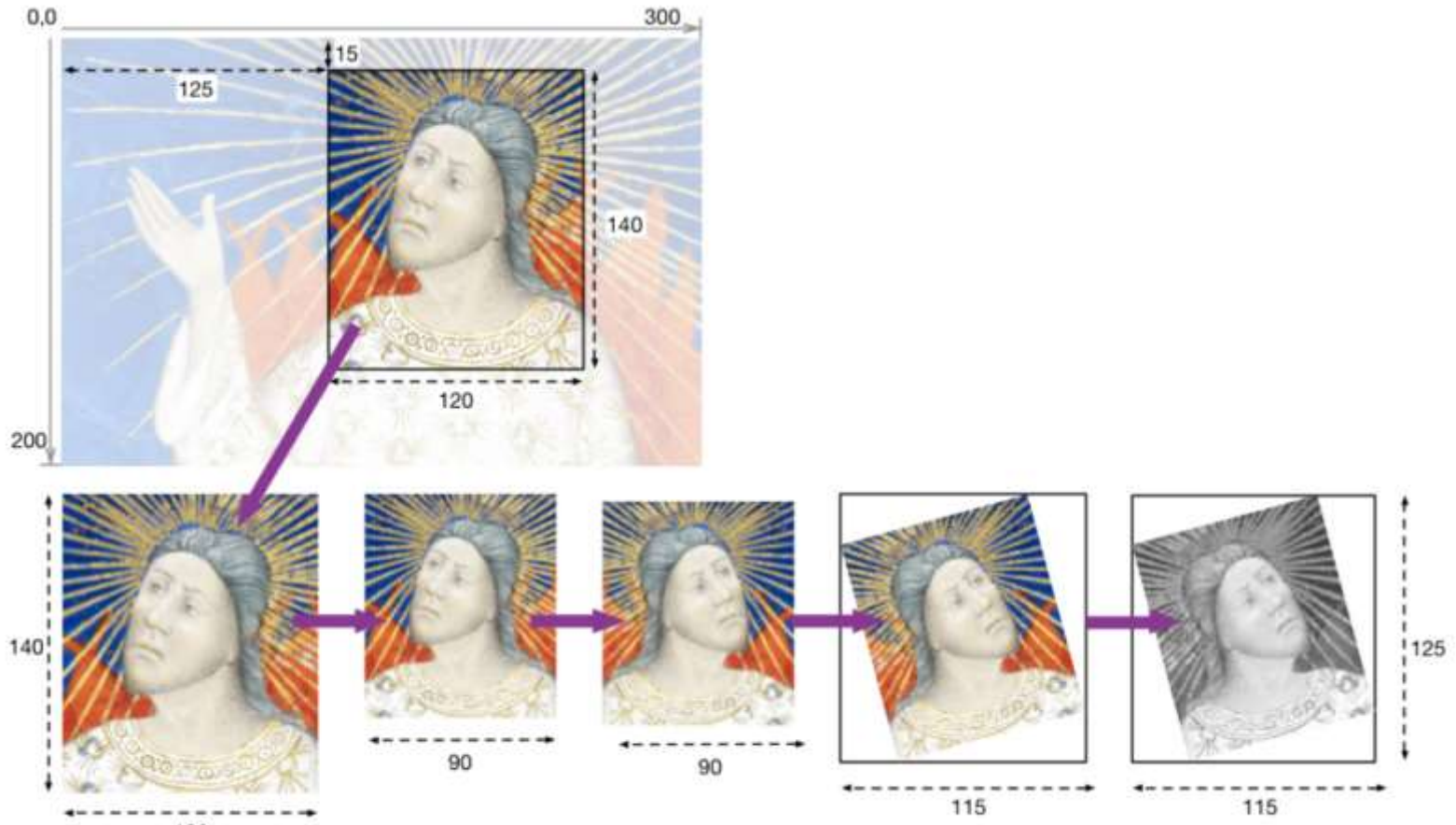


Presentation API

Just enough metadata to drive a remote viewing experience



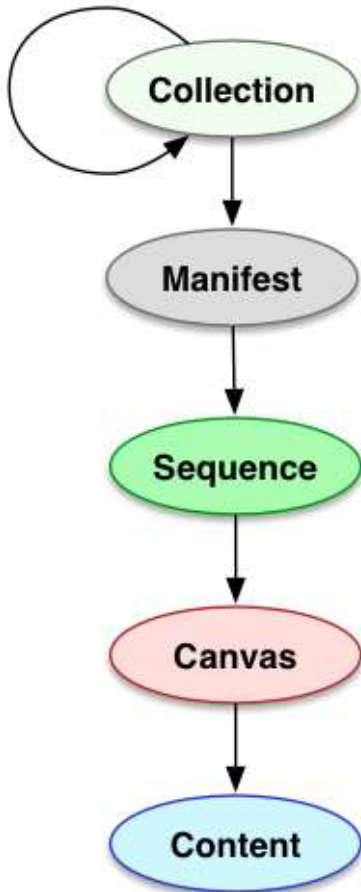
Image Delivery API



`{scheme}://{server}/{prefix}/{identifier}/{region}/{size}/{rotation}/{quality}.{format}`

<http://iiif.io/api/image/2.1/>

Presentation API



- **Structure**
 - Collection, Item, Sequence, Parts
- **Properties**
 - Labels, description, license, attribution, links

<http://iiif.io/api/presentation/2.1/>



Image + Presentation = Object

Bookmark Options Switch Workspace

MS Richardson 7. Houghton Library, Harvard University. Heures d...

- Hours of the Cross (ff. 21-35)
 - Matins (ff. 21-23v)
 - Prime (ff. 23-24v)
 - Terce (ff. 25-26v)
 - f. 25: Flagellation
 - f. 25v.
 - f. 26.**
 - f. 26v.
 - Sext (ff. 27-28v)
 - None (ff. 29-30v)
 - Vespers (ff. 31-32v)
 - Compline (ff. 33-35)
- Passion (ff. 35v-36v)
- Hours of the Holy Spirit (ff. 37-46v)

Et ton no preculz veur & ignouir.
Dieu exaudi.
Et d'auoir meus.
Dieu ihesu xpe.
filz de dieu le nre amoureux
ihesu crist pour eldore tourmens
gemissementz & cris entre lame de moy
mer & to iugement ta passio ta mort
& ta croix humblement de pit & a leur
qui me faura mouir ton fait ange
soit pres pour elle secourir fait le
ton suppli. et repartir ta place.

f. 24v. f. 25: Flag... f. 25v. f. 26. f. 26v. f. 27



Image + Presentation = Object

The screenshot shows a digital manuscript viewer interface. At the top, a browser address bar displays the URL: "MS Richardson 7. Houghton Library, Harvard University. Heures d...". Below the address bar, a sidebar on the left lists the manuscript's structure, including sections like "Hours of the Cross (ff. 21-35)", "Matins (ff. 21-23v)", "None (ff. 29-30v)", "Vespers (ff. 31-32v)", "Compline (ff. 33-35)", "Passion (ff. 35v-36v)", and "Hours of the Holy Spirit (ff. 37-46v)". A red box highlights this sidebar, and a red box also highlights the browser address bar. A central panel displays a manuscript page with a large illuminated initial 'D' and text in Gothic script. The page is surrounded by a decorative border of colorful leaves and flowers. A blue box highlights this central panel, and a blue box also highlights the text "Image API" and "Image Data" overlaid on the page. At the bottom, a horizontal strip shows a sequence of thumbnail images representing different pages in the manuscript, with labels such as "f. 24v.", "f. 25: Flag...", "f. 25v.", "f. 26.", "f. 26v.", and "f. 27". A red box highlights this thumbnail strip.

MS Richardson 7. Houghton Library, Harvard University. Heures d...

Hours of the Cross (ff. 21-35)

- Matins (ff. 21-23v)
- None (ff. 29-30v)
- Vespers (ff. 31-32v)
- Compline (ff. 33-35)
- Passion (ff. 35v-36v)
- Hours of the Holy Spirit (ff. 37-46v)

Presentation API

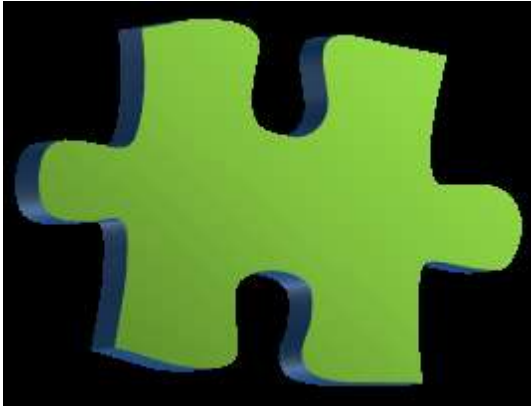
- Title Label
- Structure (TOC)
- Sequence

Image API

- Image Data

f. 24v. f. 25: Flag... f. 25v. f. 26. f. 26v. f. 27

IIIF: Two More APIs



Search Within API

Search within an object, such as the full text of a book or newspaper



Authentication API

To support login, and differential access to resources.



A Community

that develops Shared APIs,

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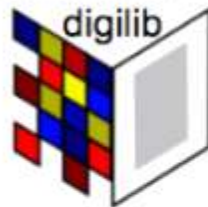
IIIF Compatible Software



Cantaloupe

High-performance dynamic image server in Java

go-iiif



OpenSeadragon



dhlab-basel / Sipi

Riiif

gem version 1.7.0 coverage 93%

A Ruby IIIF image server as a rails engine

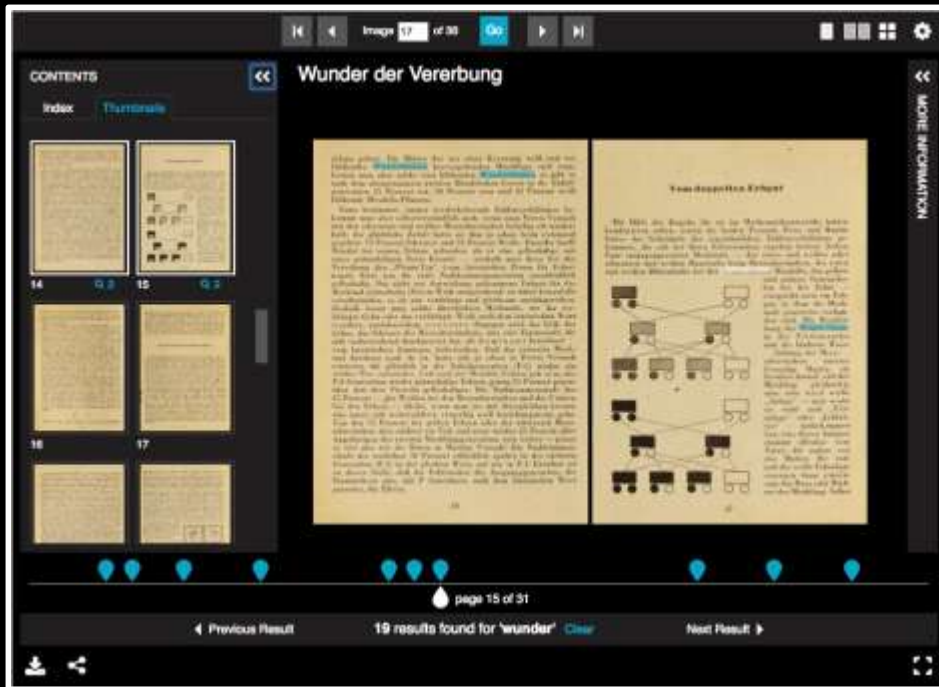


divajs

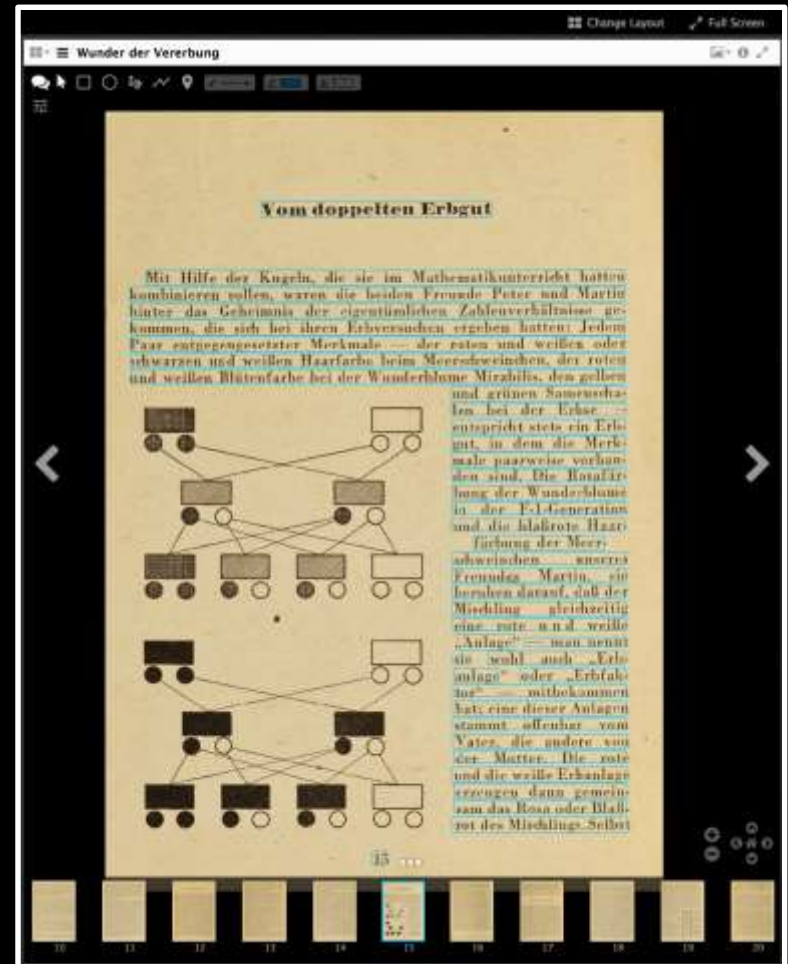
uoregon-libraries / rais-image-server

KLOKAN TECHNOLOGIES

IIF lets you choose the application

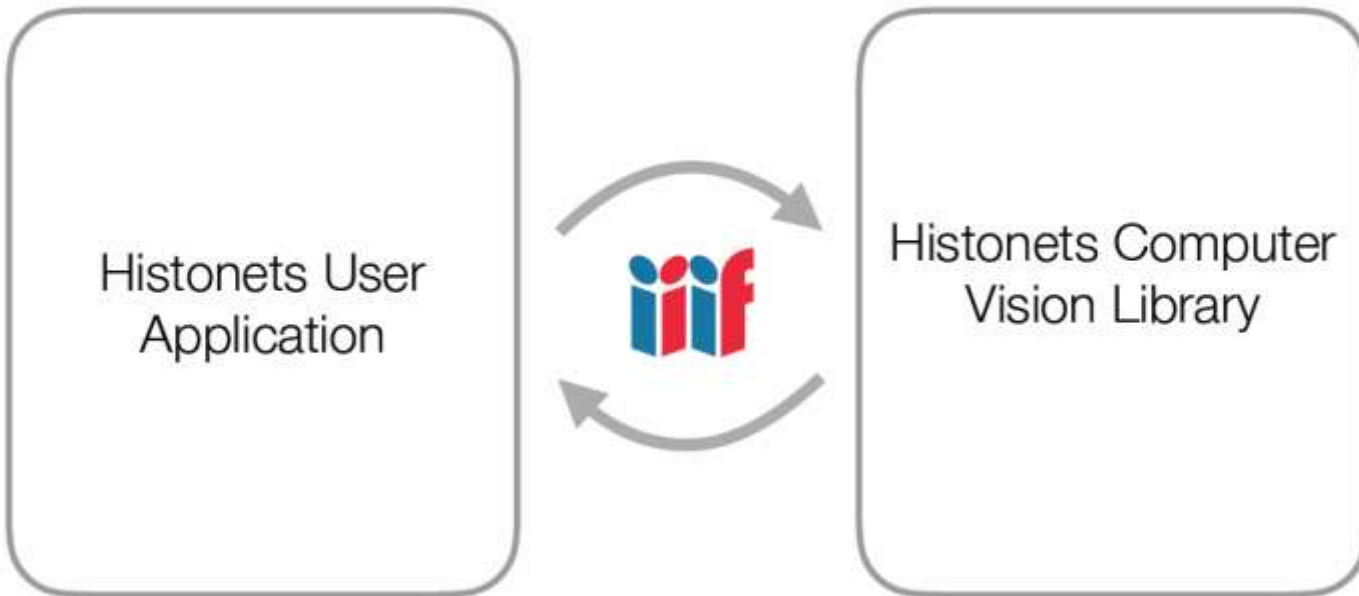


Universal Viewer



Mirador

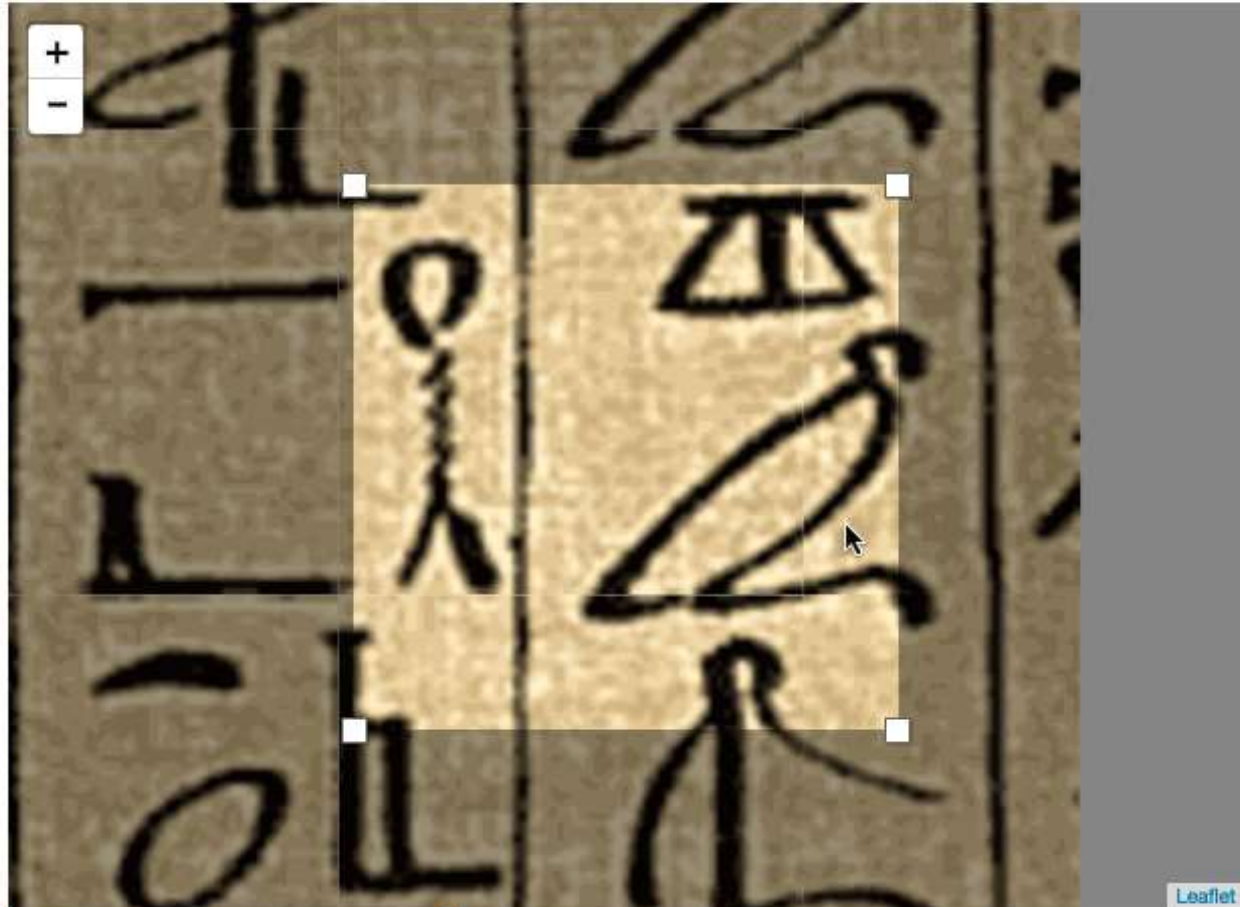
Machine learning and IIF



- Web native API's provide a consistent way to access images (and parts of images)
- IIF speaks annotations out of the box, useful for classification and shape detection

Create Image Templates

Move around the image to find templates to use for intersection finding.



Add template of cropped area

Next Step





```
$ histonets match waldo.png -th 90 puzzle.png
```

```
[[[94, 567], [116, 610]]]
```






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1,000,000,000+
Images

from

100+ Institutions

Libraries, Archives, Museums, Projects



Hundreds of adopters

Scores of applications

Millions of digital objects

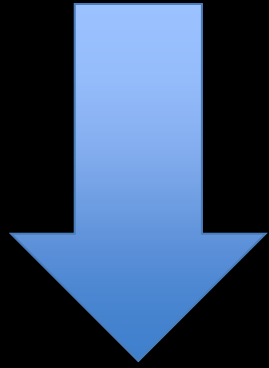
Revolutionary promise

How to Participate

1. Expose your collections via IIF
2. Use IIF-compatible software
3. Ask your software suppliers to become IIF-compatible
4. Participate in the IIF community
5. Join the IIF Consortium

IIIF Communication Channels

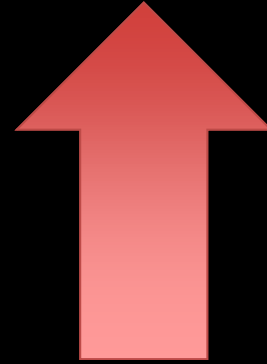
- IIIF Website: <http://iiif.io>
- iiif-discuss@googlegroups.com
- IIIF Slack Team – Join at <http://bit.ly/iiif-slack>
- Twitter: [@iiif_io](https://twitter.com/iiif_io) and [#IIIF](https://twitter.com/iiif)
- Awesome-IIIF on [Github](#)
- IIIF [YouTube Channel](#)
- IIIF Events



Friction

- Better, faster, deeper, cheaper delivery
- Plug-and-play software
- Publish once, reuse often

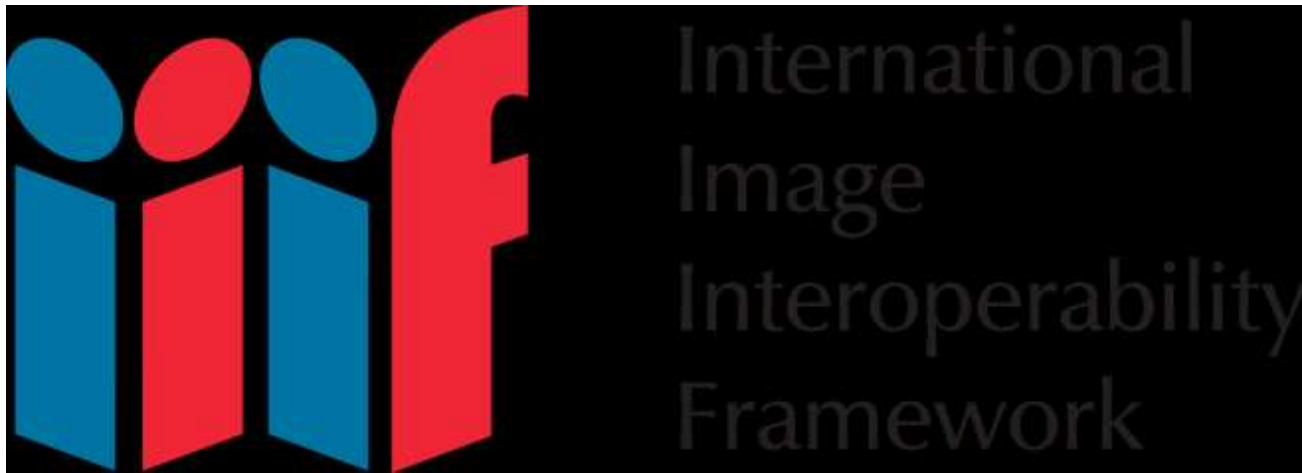
Interaction



- Zoom, pan, manipulate
- Compare, reunite, remix & overlay
- Cite, share, annotate
- Apply machine learning and AI

Why embrace IIF?

1. State of the art functionality
2. Cheaper, faster and more efficient
3. Benefits of an international standard
4. Maximize impact, use and value of your content
...without giving it away
5. Be at the forefront of digital innovation
...with a global community of leaders



iiif.io

 @iiif_io