



International Image Interoperability Framework

National Library of Korea | November 2023

Tom Cramer
Stanford Libraries
tcramer@stanford.edu

Simeon Warner
Cornell University Library
simeon.warner@cornell.edu

It all started with Parker.stanford.edu

PARKER LIBRARY *on the web*


- Back to search
- Back to page turner
- Back to thumbnails
- Manuscript description
- Print view
- Home

View with scale
View without scale


Manuscript 161
f. 11 R

Manuscript Title
Matthew Paris OSB,
Chronica maiora II


Foliation
ff. a-b + i-v + c-d



« Prev | Next »

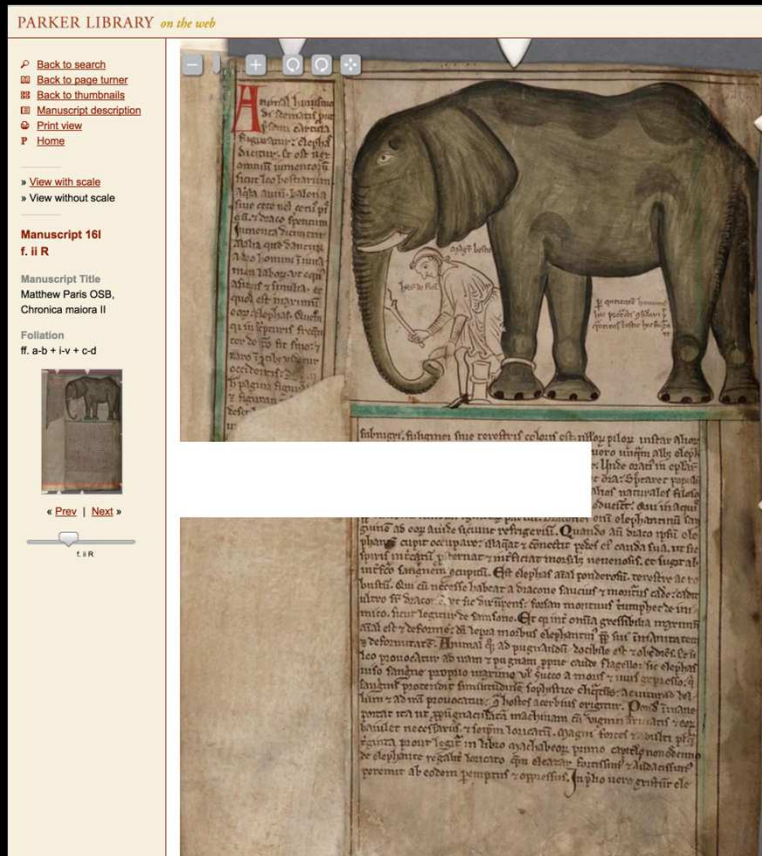


11 R



The image displays a digital view of a manuscript page from Parker Library. The page is divided into two columns of Latin text. The right column features a large, detailed illustration of an elephant, with a man standing beside it, holding a staff. The text is written in a Gothic script. The page is identified as folio 11 R of Manuscript 161, titled 'Chronica maiora II' by Matthew Paris OSB. The interface includes navigation controls such as 'Back to search', 'View with scale', and 'View without scale'.

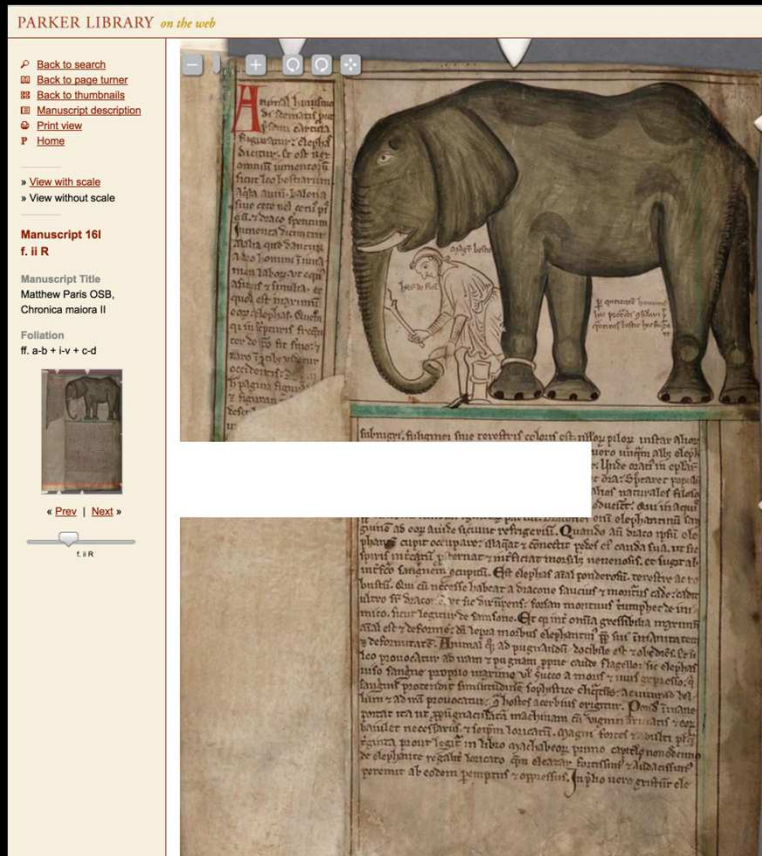
It all started with Parker.stanford.edu



A beautiful digital library collection

...that was hard to build,
...with slow-loading images,
...locked down to one site,
...in a single viewer,
...without annotations or
other interactive tools,

It all started with Parker.stanford.edu



A beautiful digital library collection

...that was hard to build,
...with slow-loading images,

...locked down to one site,
...in a single viewer,

...without annotations or
other interactive tools,

and its users wanted more!



WWMD?



Stop & Think



Stop & Think

Who else had the same problems?

What were we collectively trying to do?

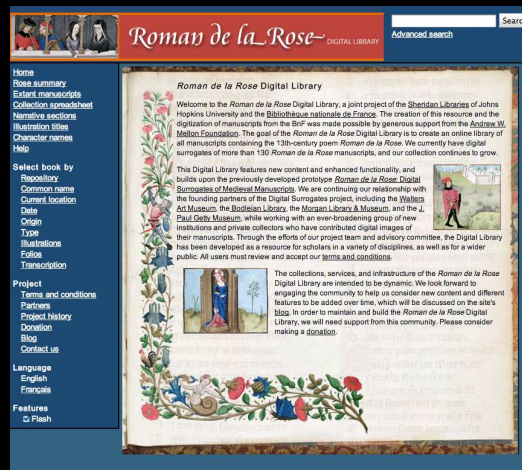
What were the core scholarly needs?

What could we do, together?

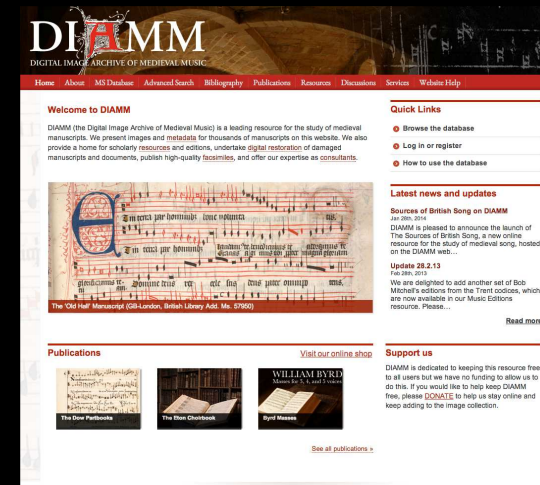
Fellow Travelers



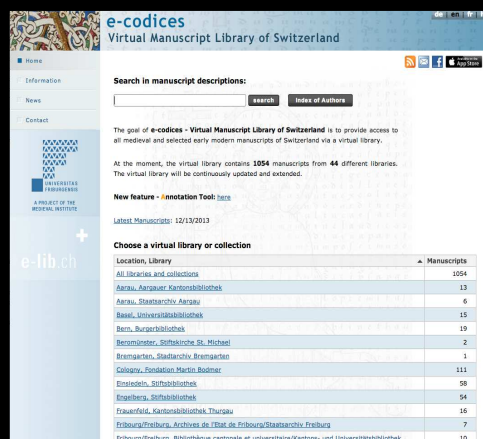
Parker on the Web



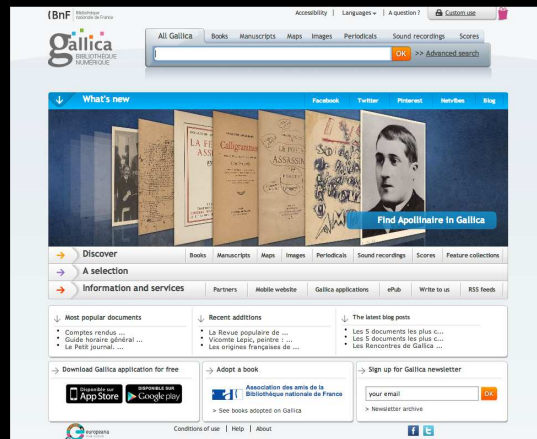
Roman de la Rose



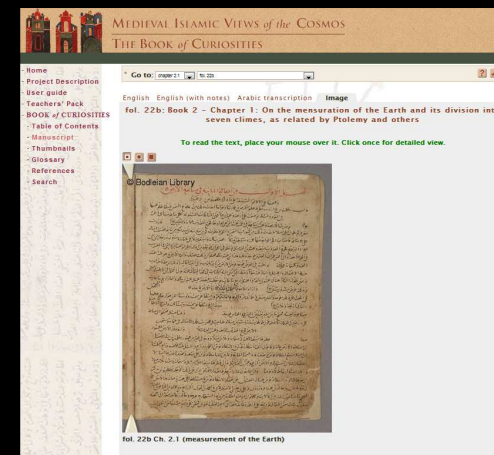
DIAMM



eCodices



Gallica

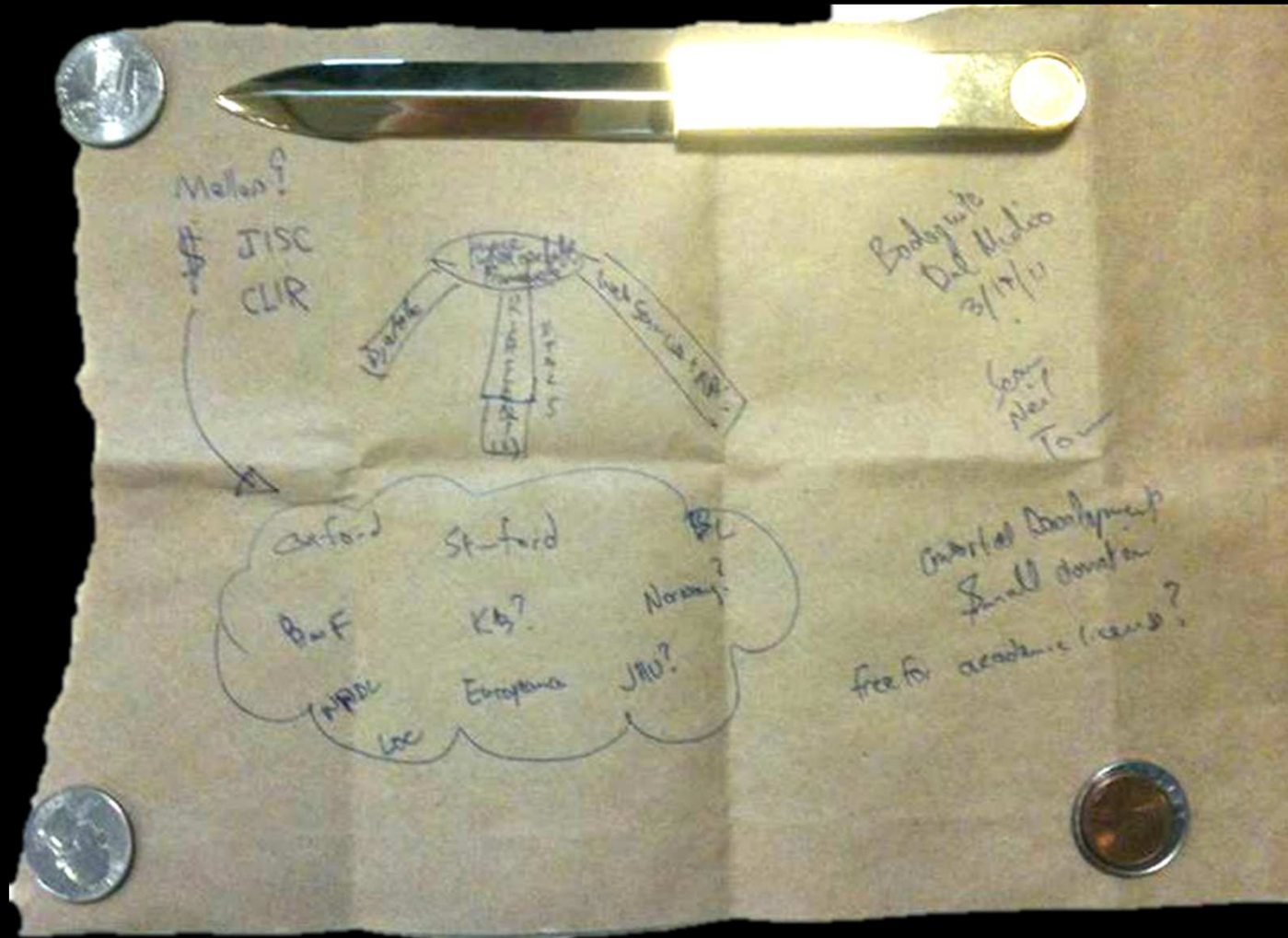


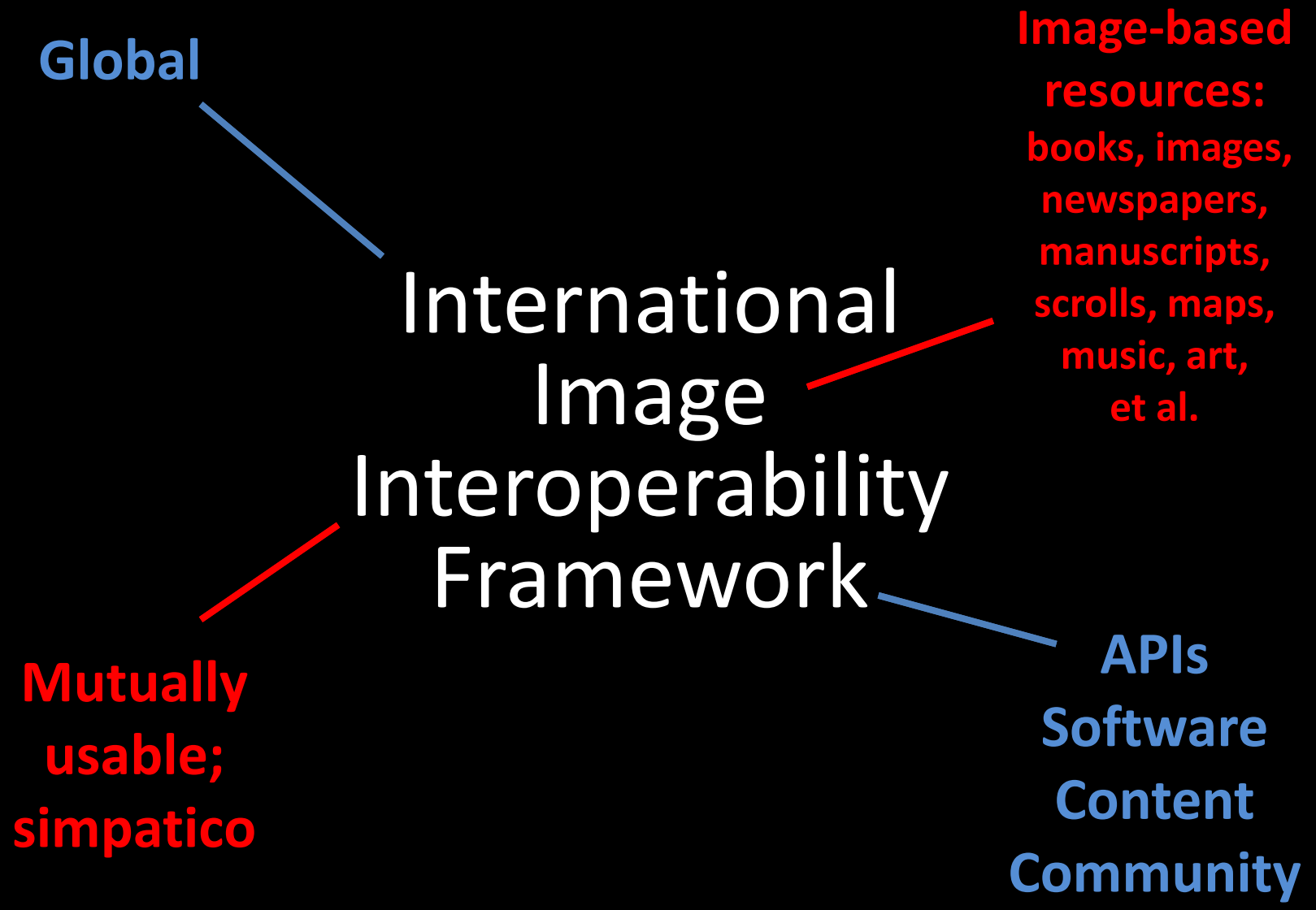
Oxford



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

Over Dinner, A Plan Is Hatched





Images are fundamental information carriers for cultural heritage



...day was a big happy Me
overanxious to please.
XXXXXXXXXXXXXXXXXXXXX sev
another wild day began.
...iled into that and took
...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
- *siloed*



Capabilities

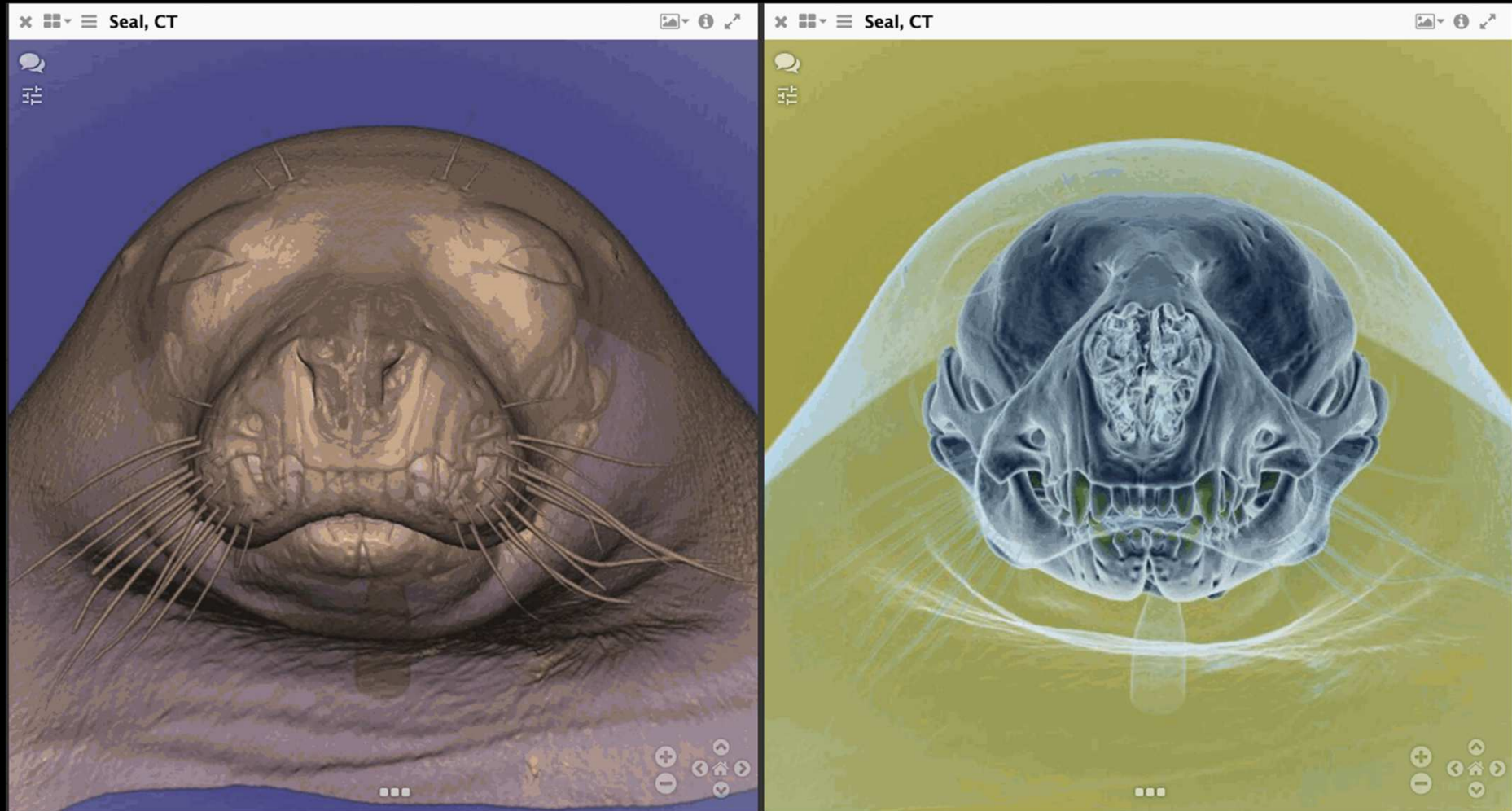
Deep zoom with large images



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>


For a single object



THE LEIDEN
COLLECTION

ZOOM   | VIEWS  XR IR | MODES   |  | 



 Show Details

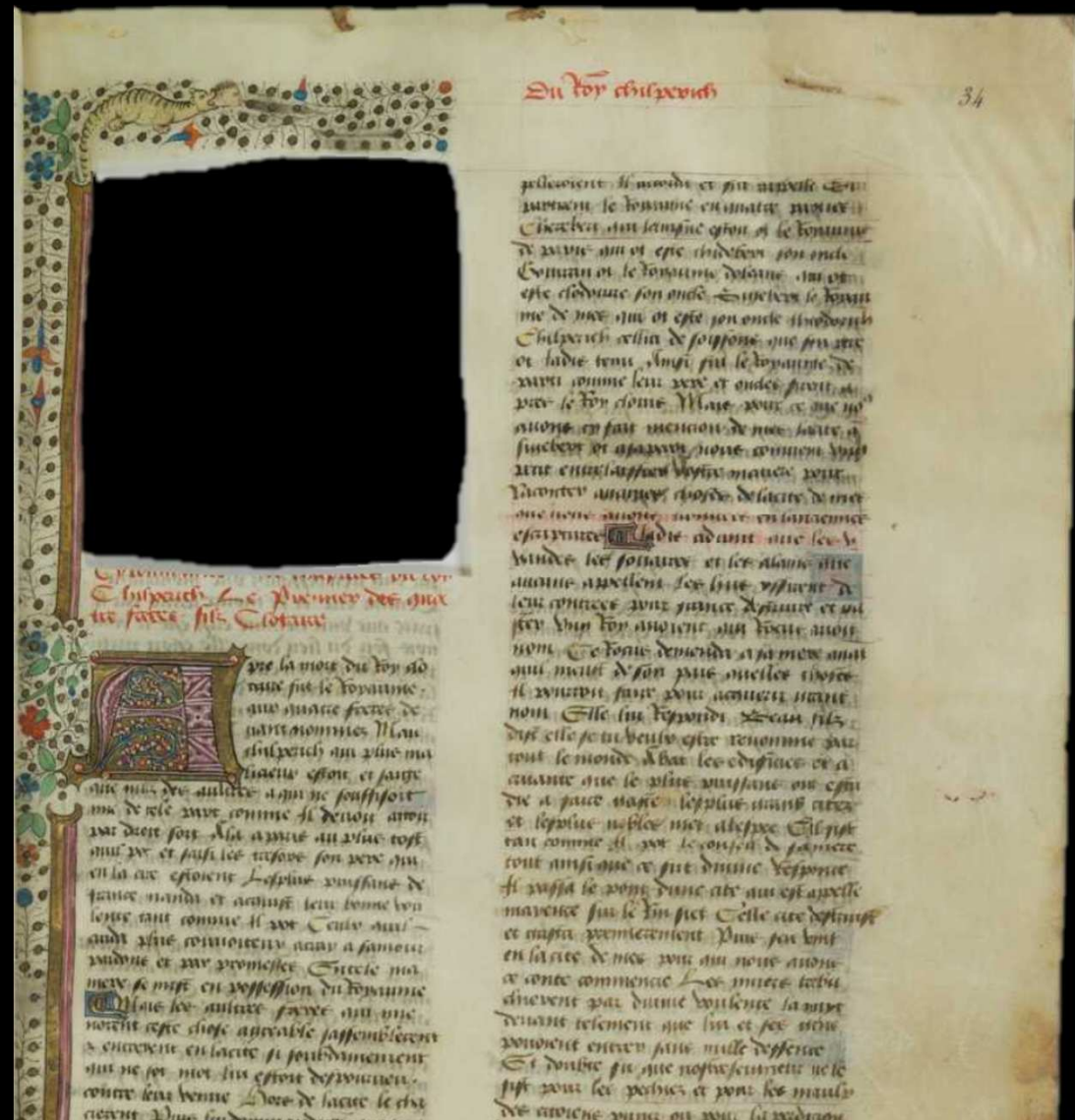
<https://www.theleidencollection.com/viewer/david-and-uriah/>

Collect items that belong together

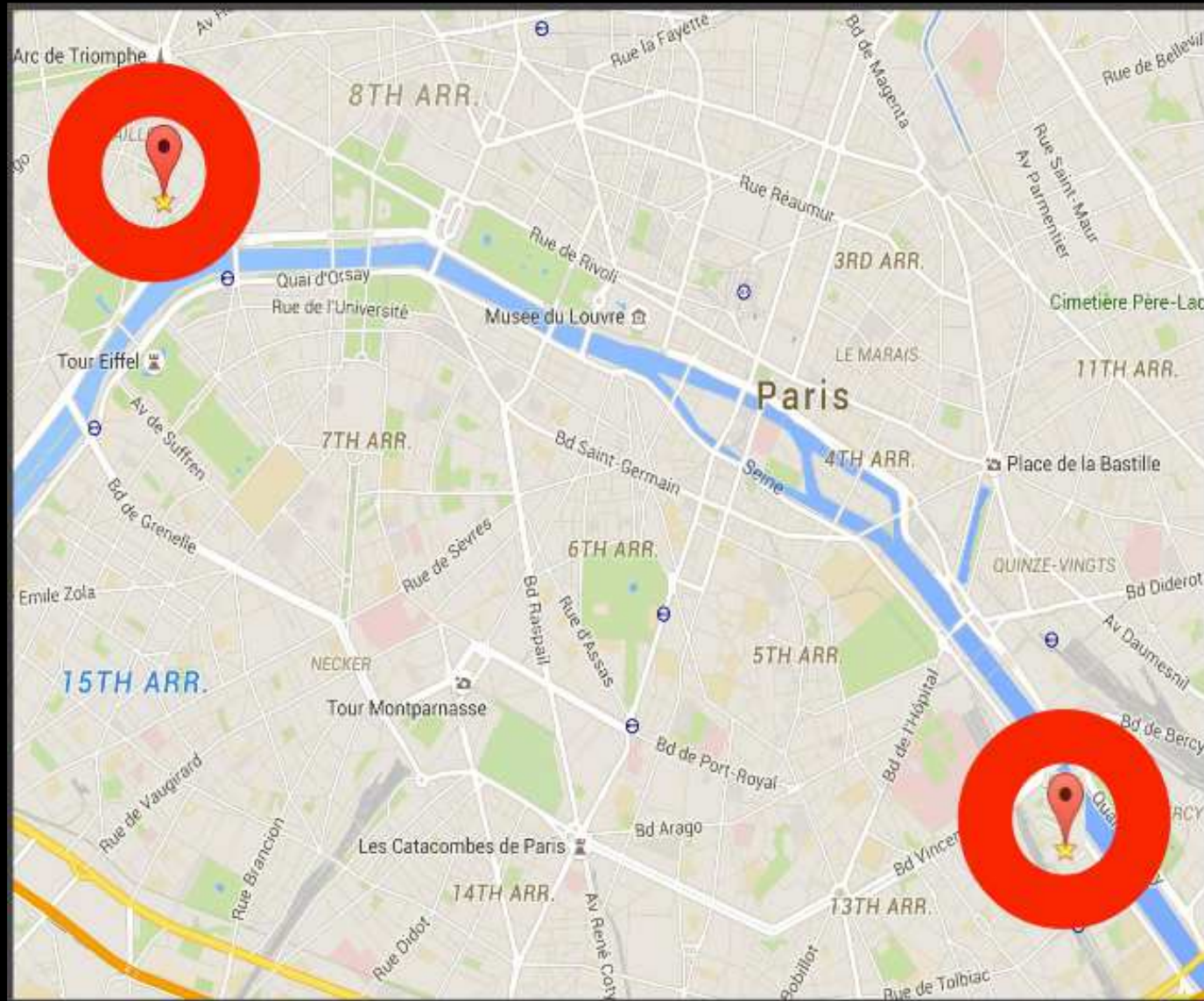


Le manuscrit 5 de la
Bibliothèque municipale de
Châteauroux, c. 1460

Folio in BVMM
Miniature in the BNF



Collect items that belong together






Reunify

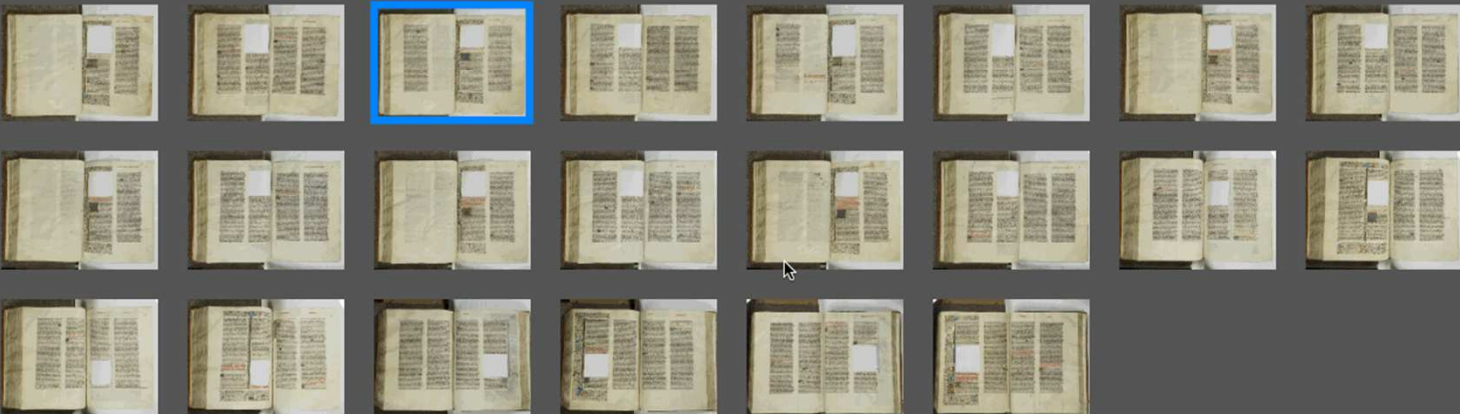
Biblissima ^{II} PROJET ↓ OUTILS DÉMOS DOC

Démos ^{II} f t u o

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 the final victory in the war is 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

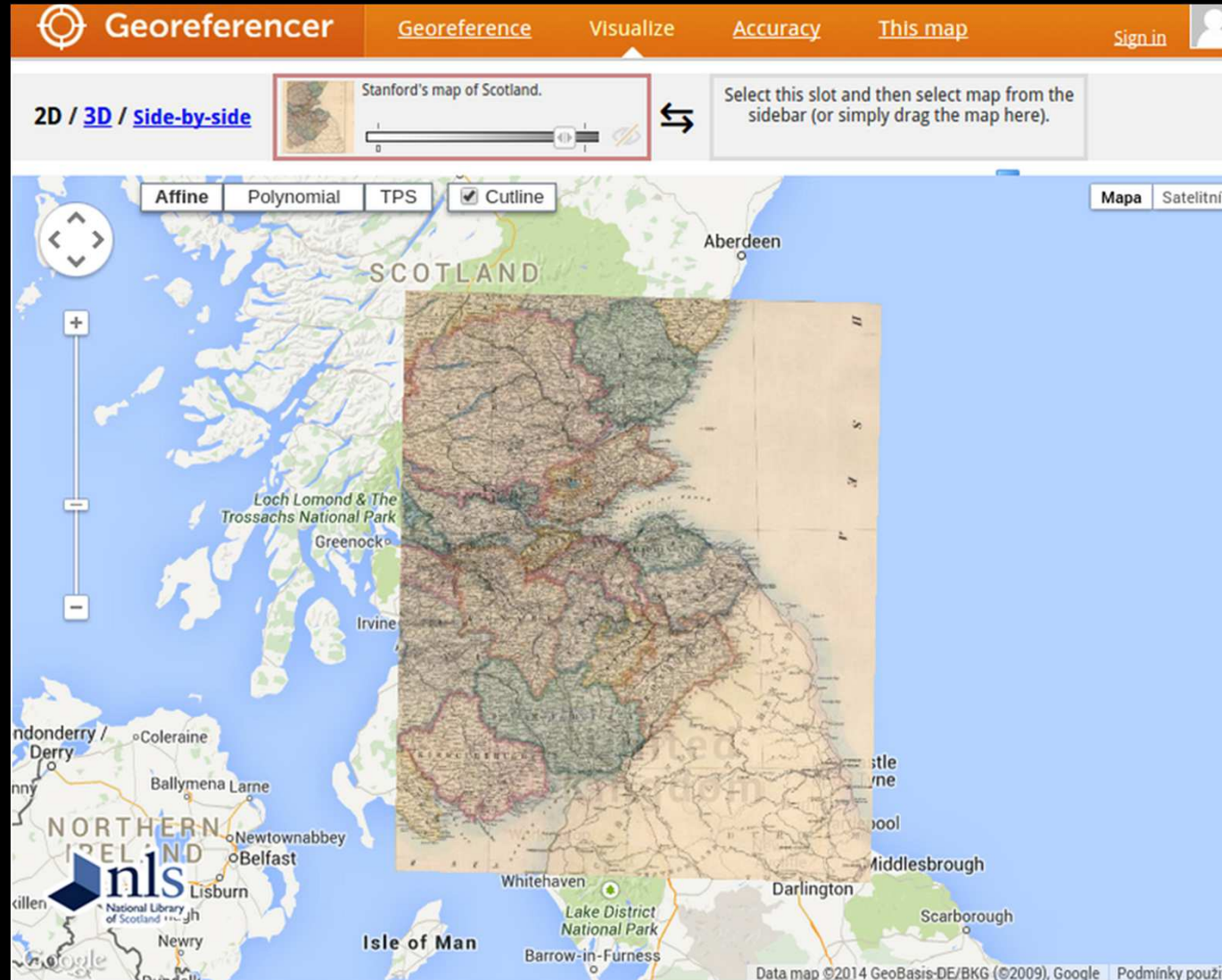
Three Alamogordo Juries Refuse To Indict Talley For Murder

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



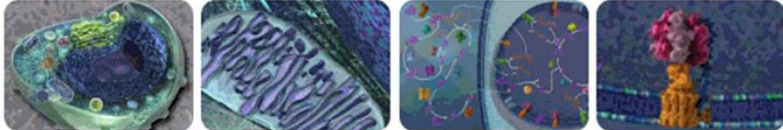
Klokan Technology's Georeferencer

Annotate

Course CellXplorer Syllabus and FAQs

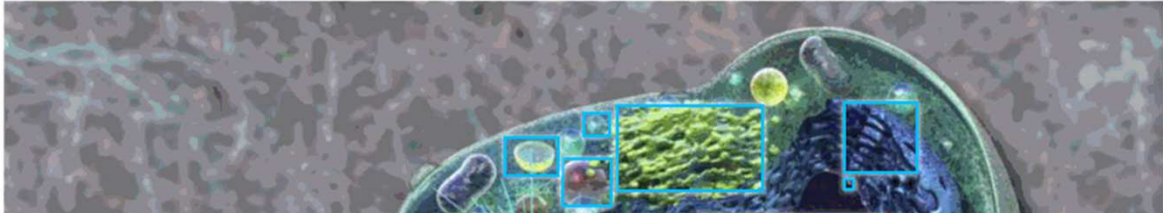
CellXplorer is an interactive and annotated graphic that you can navigate. You can click on the buttons below to zoom in. As each week's content becomes available, you can also navigate to the lesson associated with that part of the cell! The graphic below can sometimes take some time to load.

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

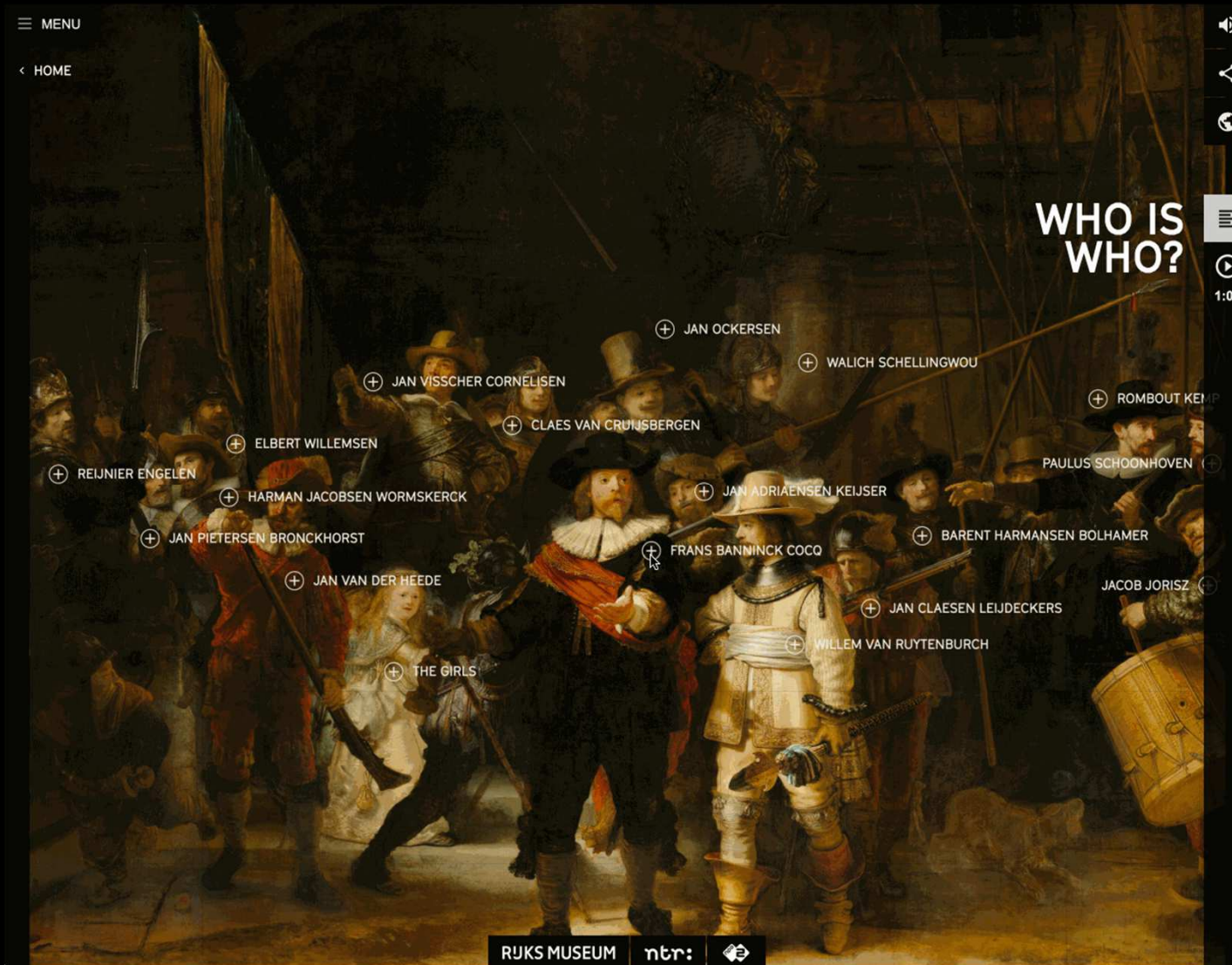
Teacher

Description

Description of the person identified

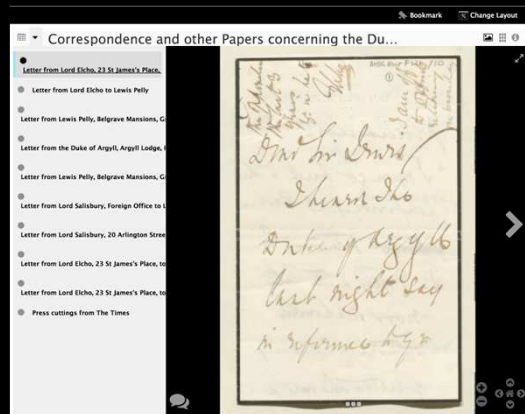
Charlotte was 14 in this photo but grew up to be the local teacher

Exhibit

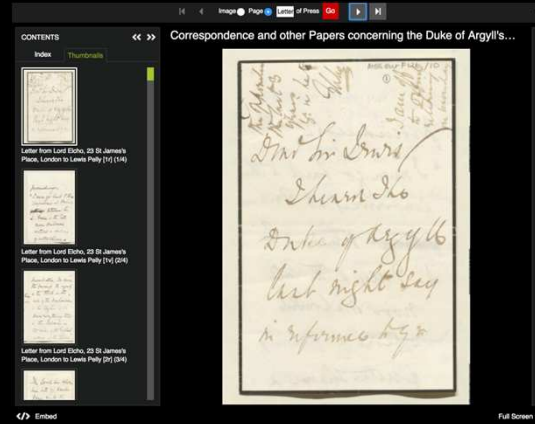


Micr.io Exhibit of the Rijksmuseum's Nightwatch

All with the application of your choice



Mirador



Universal Viewer



IA Book Reader



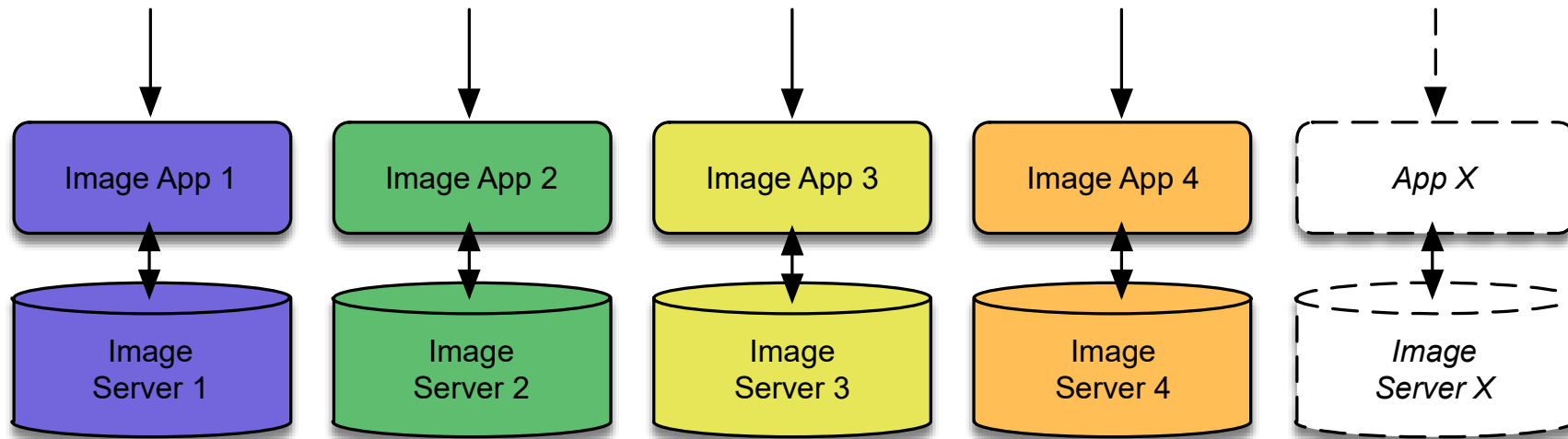
Qatar Digital Library
Archival papers shown in 4
different viewers.

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



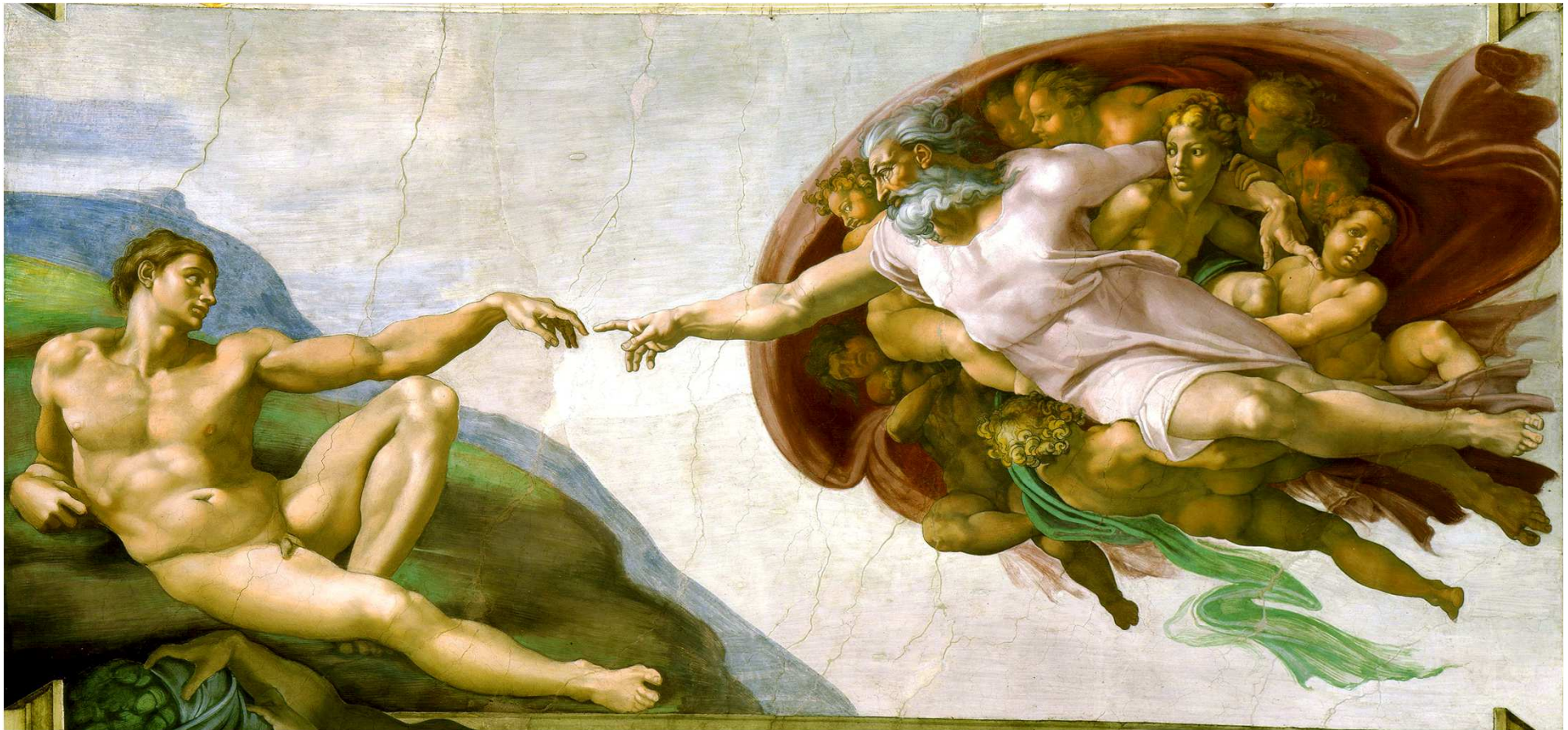
How Does IIF Work?

A world of silos & duplication



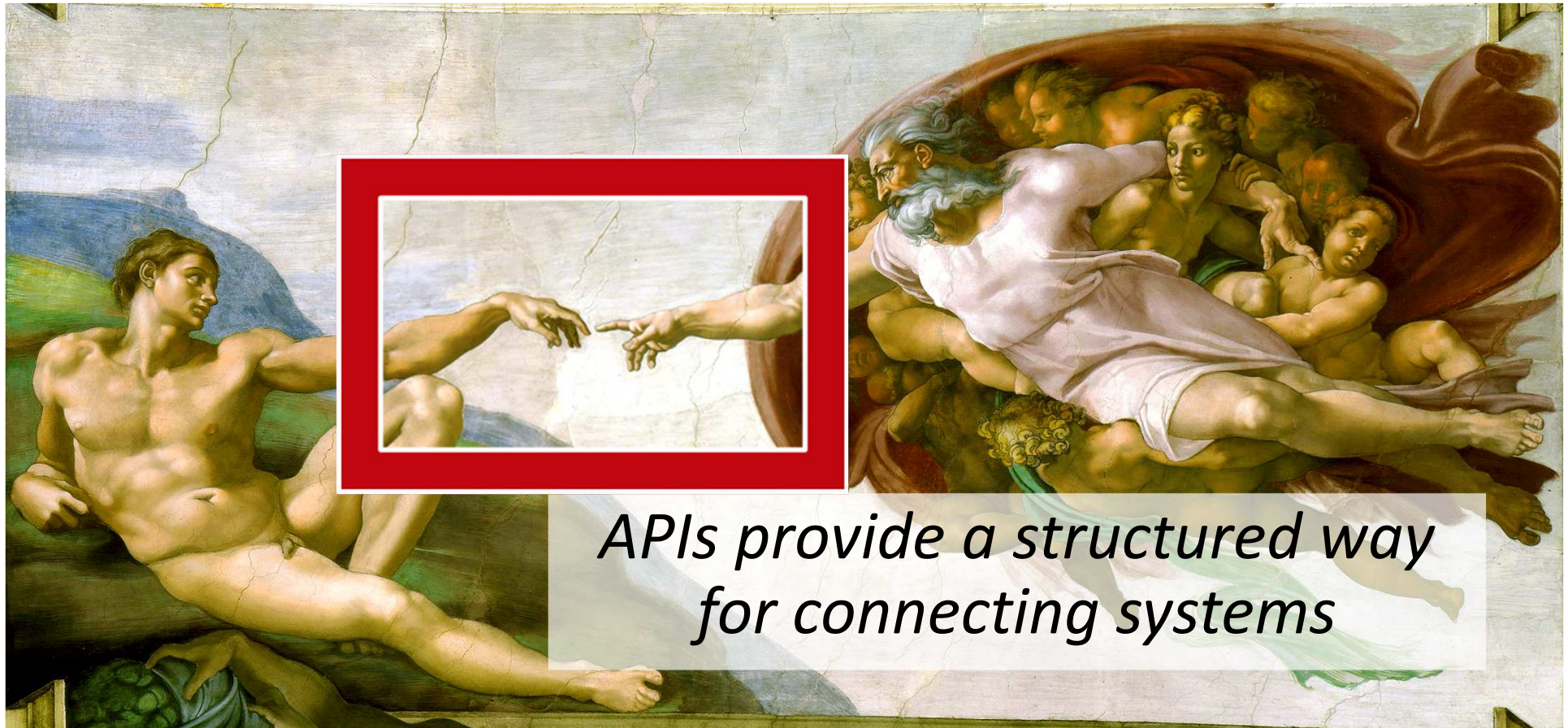
- Every site a silo (→ no interoperability)
- Every app a one-off (→ overhead to code and keep)
- Every user forced to cope (→ many UIs, little integration)

Application Programming Interfaces



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

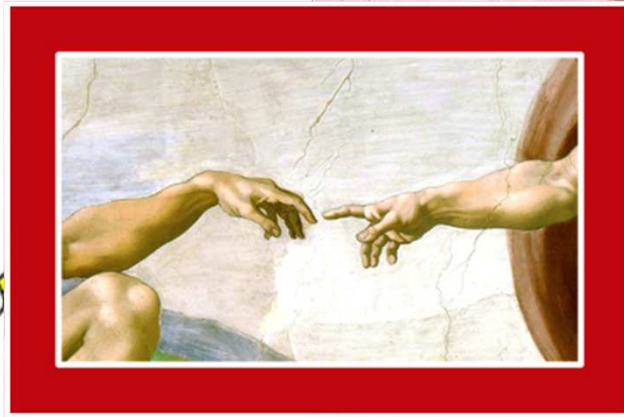
Application Programming Interfaces



*APIs provide a structured way
for connecting systems*

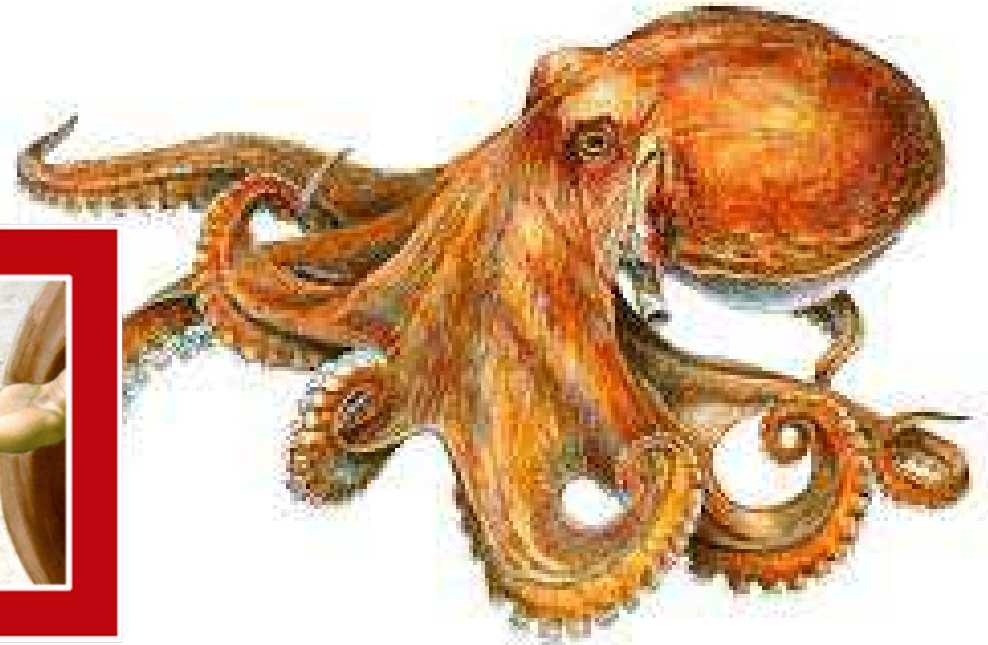
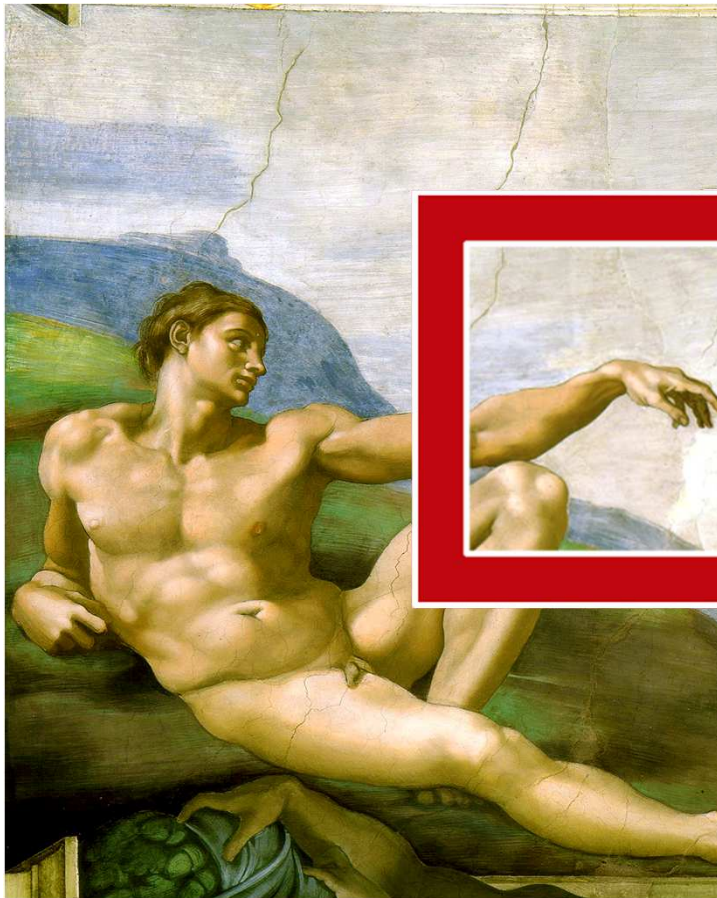
https://commons.wikimedia.org/wiki/File:Creaci%C3%B3n_de_Ad%C3%A1m.jpg

Application Programming Interfaces



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

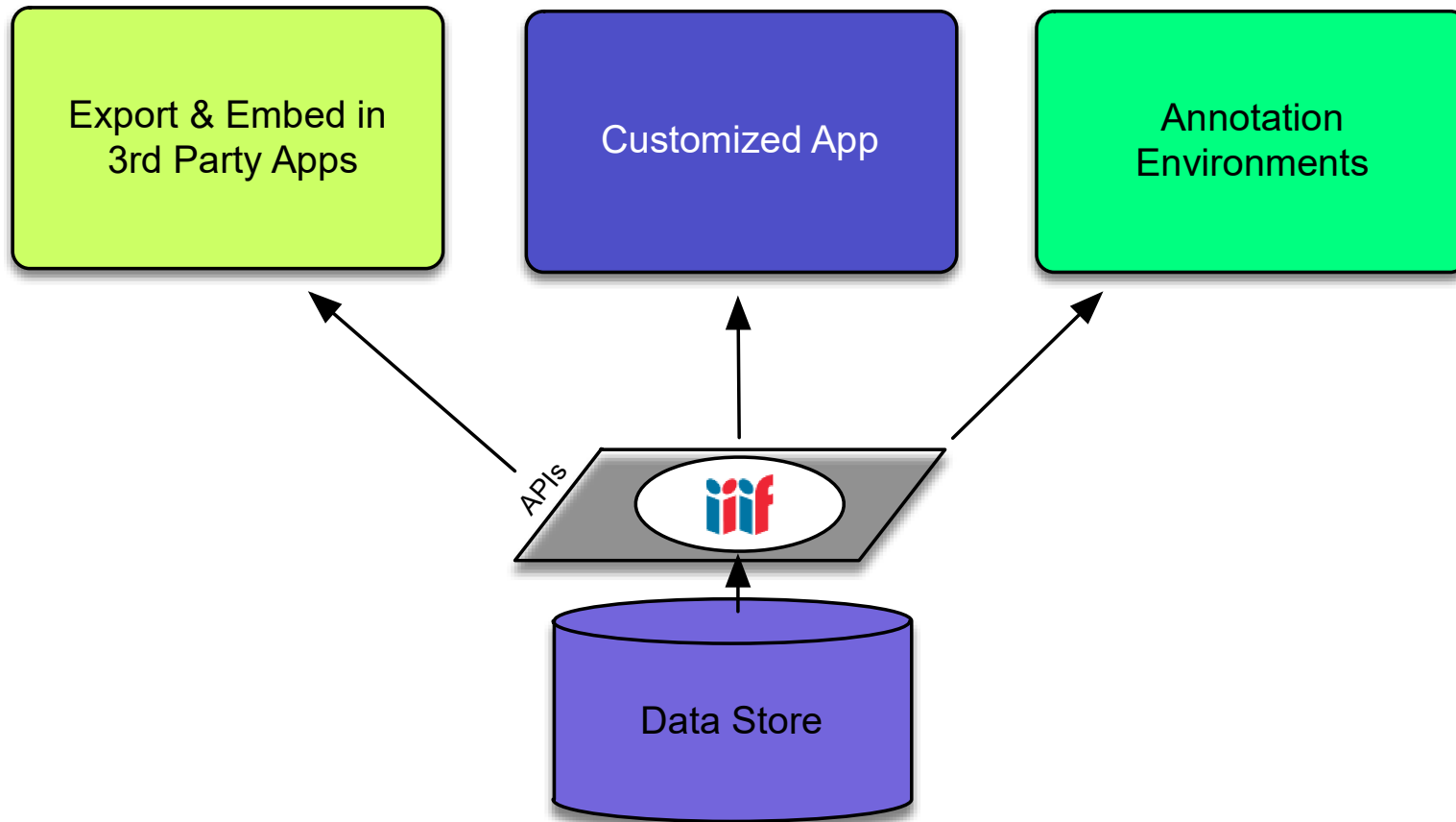
Application Programming Interfaces



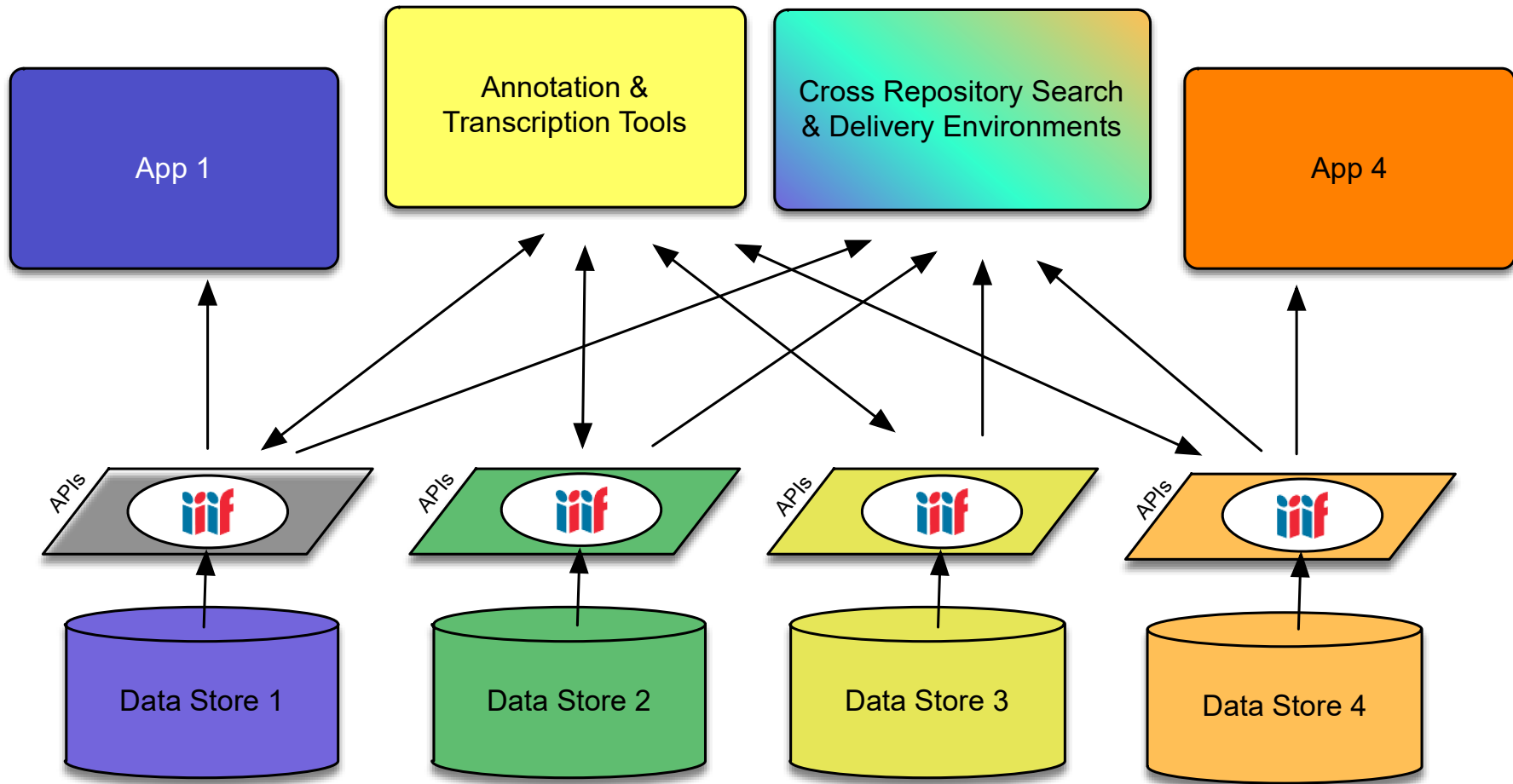
Application Programming Interfaces



APIs enable reuse



APIs -> Framework -> Ecosystem



IIIF Vision

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



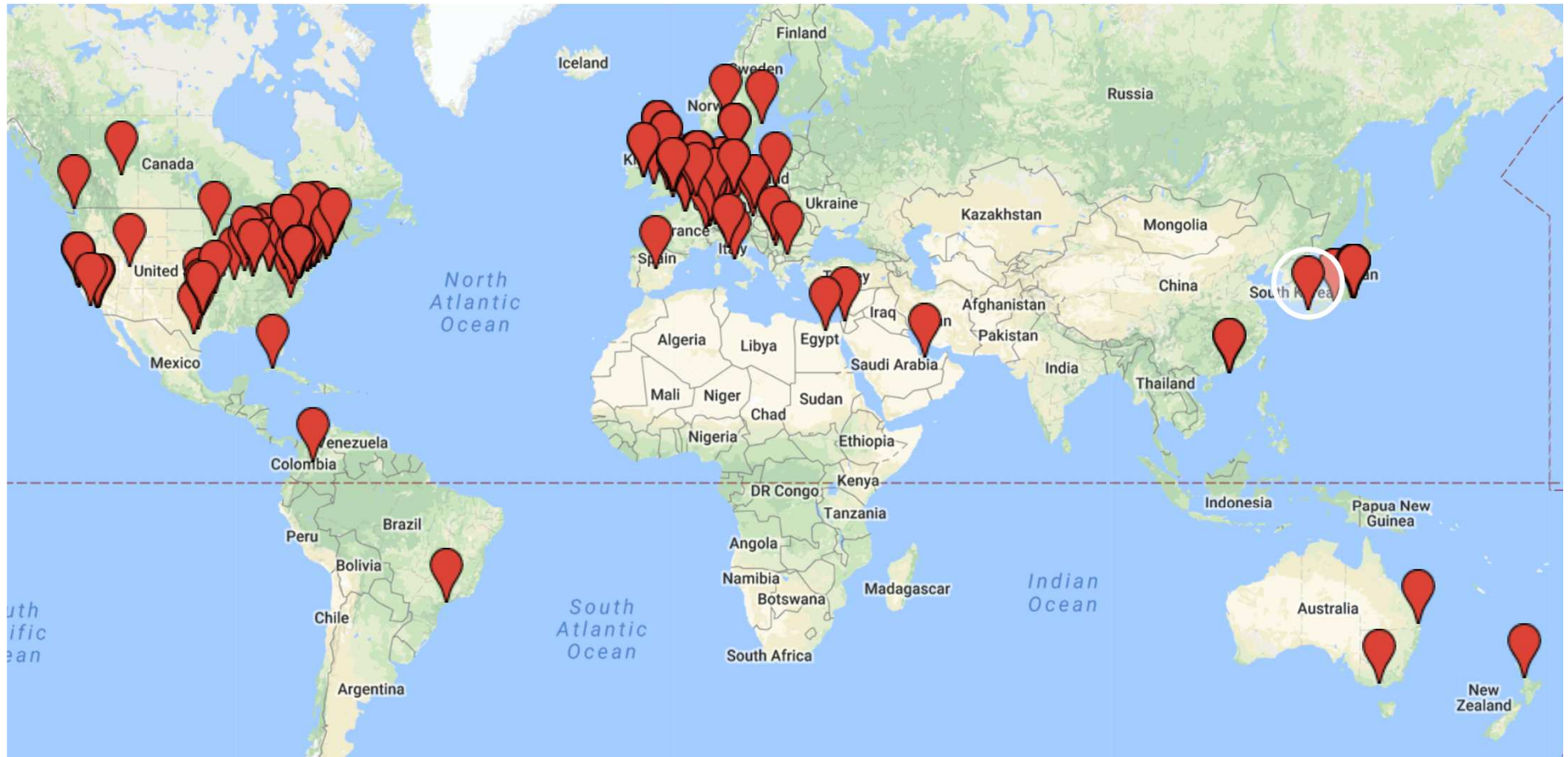
A Community
that develops **Shared APIs**,
implements them in **Software**,
and exposes interoperable **Content**



A Community

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

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!

IIIF is Used Broadly

- Libraries (small libraries up to national libraries)
- Museums (curatorial, education, engagement, etc.)
- Scholarship and research
- Teaching and instruction
- Digital humanities projects
- AI/machine learning projects
- STEM -- bio imaging, life sciences, etc.
- ... and many more!

Institutions AND Individuals



IIF Annual Conference, Göttingen, Germany, June 2019



A Community

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

IIIF: Two Core APIs

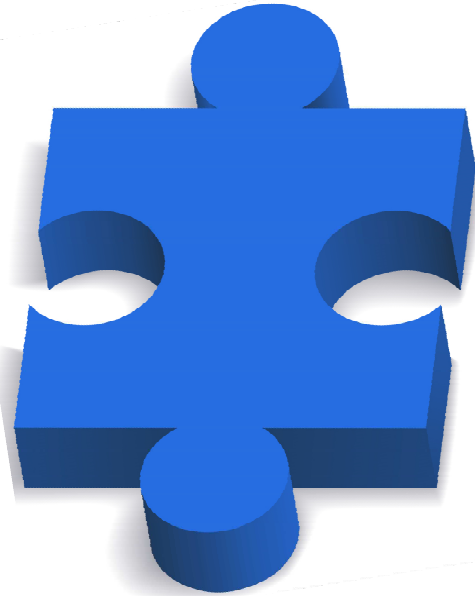


Image API

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



Presentation API

Just enough metadata to drive a remote viewing experience

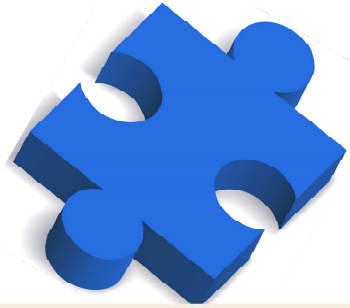
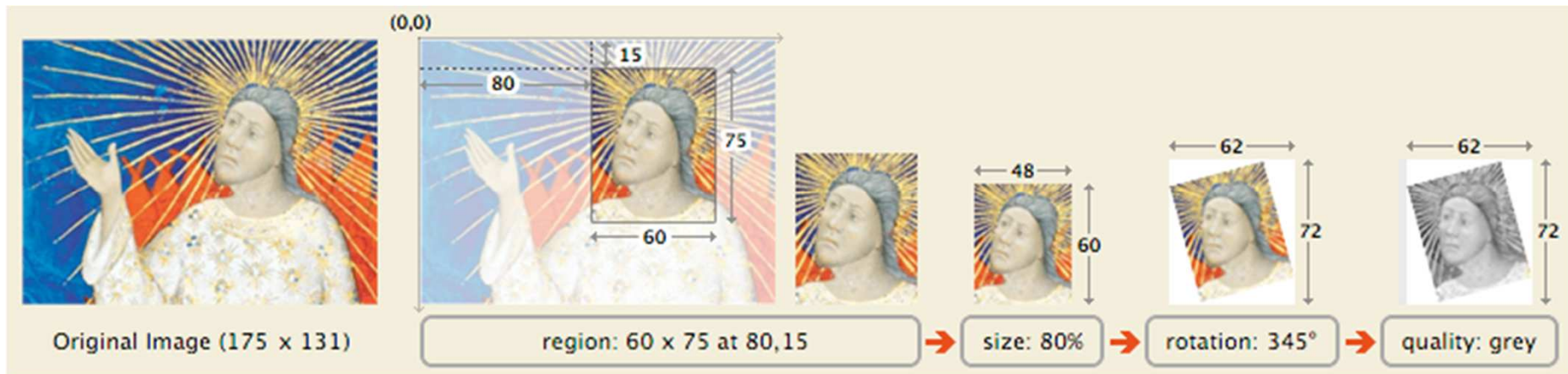


Image Delivery API

Order of Implementation

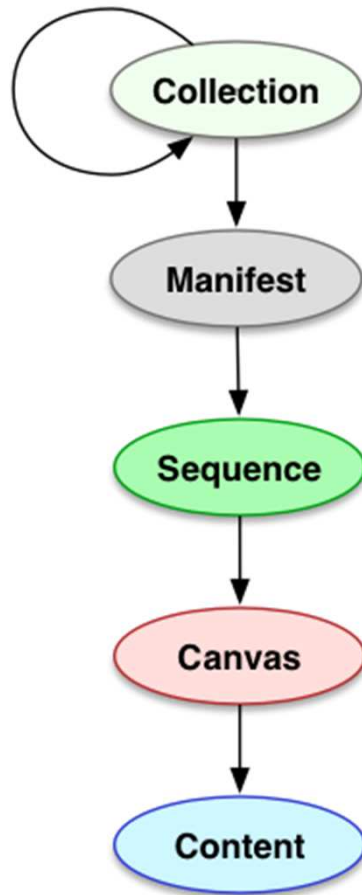
<http://www.example.org/image-service/abcd1234/80,15,60,75/pct:80/345/grey.jpg>

region size quality
rotation format



<http://iiif.io/api/image/3.0/>

Presentation API



- **Structure**

- Collection, Item, Sequence, Parts

- **Properties**

- Labels, description, license, attribution, links

<https://iiif.io/api/presentation/3.0/>

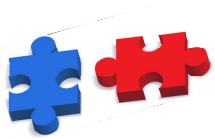


Image + Presentation = Object

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

Bookmark Options Switch Workspace

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 deue + ignouuer.
Dne exaudi. **oraison** exauce sire pto amo.
Et clamor meus. **or**ation
ffing deue toy pteuigne ma
clamour. **Diemus. or**
Dne ihesu xpe. **or**ation
fils de dieu le uis amoureux
ihflucit pour eldno tourmens
gemissement + cris entre lame de moy
mer + to iugemet ta passio ta mort
+ ta croix humblemet de prit + a leur
qui me faura mouir ton fait ange
loit pres pour elle secourir sire le
ten suppl. et repartir ta place.

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

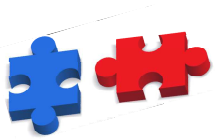


Image + Presentation = Object

The screenshot shows a digital manuscript viewer interface. At the top, there is a browser-like header with 'Bookmark', 'Options', and 'Switch Workspace' buttons. Below this is a red-bordered box containing the title 'MS Richardson 7. Houghton Library, Harvard University. Heures d...'. The main content area is divided into two parts: a left sidebar and a central image viewer. The sidebar, also outlined in red, contains a table of contents for 'Hours of the Cross (ff. 21-35)', listing sections like '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 is overlaid on the sidebar with the text 'Presentation API' and a list of features: 'Title Label', 'Structure (TOC)', and 'Sequence'. The central image viewer, outlined in blue, displays a manuscript page with a large decorated initial 'D' and text in Gothic script. A blue box is overlaid on the image viewer with the text 'Image API' and 'Image Data'. At the bottom, a red-bordered box contains a horizontal strip of thumbnail images representing other pages in the manuscript, labeled 'f. 24v.', 'f. 25: Flag...', 'f. 25v.', 'f. 26.', 'f. 26v.', and 'f. 27v.'. Navigation arrows are visible on the left and right sides of the image viewer.

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

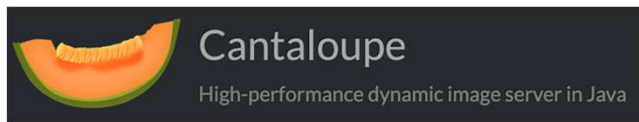
- Image Data

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



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

Compatible Software



djatoka



dhlab-basel / Sipi



kakadu software

IIIF Curation Viewer

cogapp



tb text & bytes

netx





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

IIIF Content – Digital Images

South Korea, Juhamnu Pavilion in Front of Buyongji Pond in Changdok Palace in Seoul.



IIIF Content - Texts

- Example: Illustrierter Sonntag (Der gerade Weg), 22.09.1929, from the Bavarian State Library



IIIF Content – Scientific Images



- Example: *Acacia* - *Fabaceae*, from the Natural Sciences Institute of the National University of Colombia

IIIF Content – Cultural Heritage

- Paintings
- Maps
- Manuscripts
- Photographs
- Scrolls
- Sculpture
- Sheet Music



- Any kind of image content

Compatible Content

**Billions of
Images**

from

**Thousands of
Institutions**



How it Works

IIIF APIs



Image API

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



Presentation API

Just enough metadata to drive a remote viewing experience



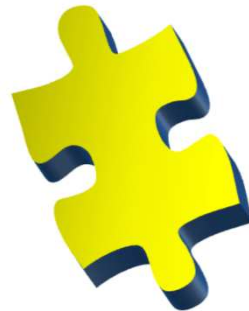
“A/V API”

Deliver time-based media (audio, video)



Content Search API

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



Authorization Flow API

To support login, and differential access to resources.

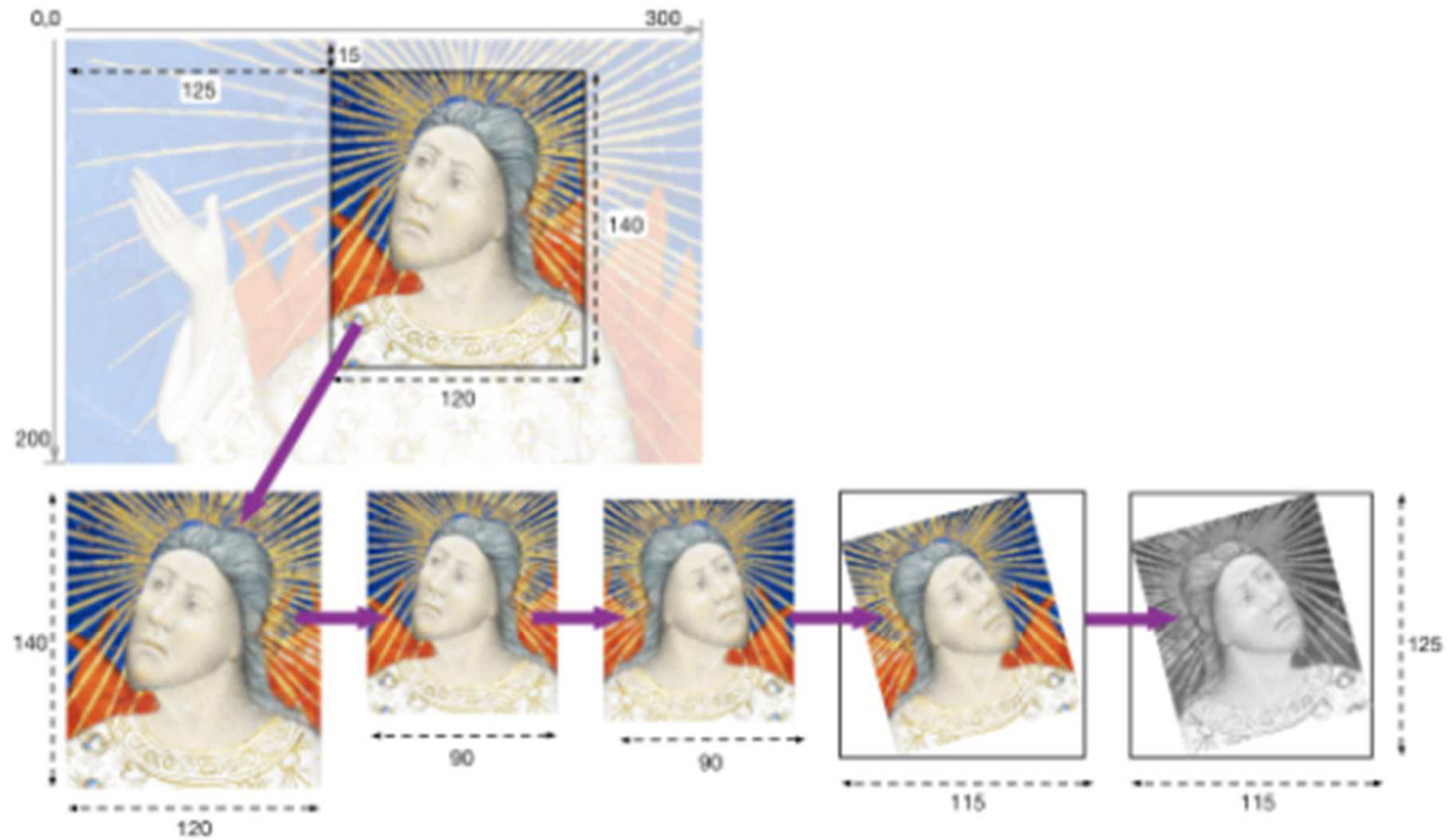
plus...

Content State API

Change Discovery API

“3D”...


Image API



1 region=125,15,120,140 size=90, rotation=!345 quality=gray
.../125,15,120,140/90,/!345/gray.jpg

Joyful image pan and zoom

Seoul: Lily pads



DOWNLOAD

Title: Seoul: Lily pads
Collection: [Willard D. Straight in Korea](#)
Date: [ca. 1904](#)
Location: [Kyonghoeru, Seoul, South Korea](#)
Country: [South Korea](#)
[United States](#)
ID Number: 1260.60.09.32.01
Collection Number: 1260
File Name: 1260.60.09.32.01.tif

About the collection

[Digital collection website](#) →
[Finding aid](#) →
[Catalog record](#) →
[View collection in Artstor](#) →

Machine access for AI

Transformers for Handwritten Text Recognition

Fine-tuning for Norwegian via forced alignment of “dirty” English transcription

Forsteblad

NORSK ETNOLOGISK GRANSKING

Emnentr. 3. "Brynet"

Fylke:

Tilleggsoppsmalnr.

Herad:

Emne:

Bygdlaag:

Oppskr. av: *David S. Halvorsen*

Gaed:

(adresse): *Tobryet*

G.nr.

A. Merk av om oppskrifta er etter eiga røynsle.

B. Eller om den er etter andre heimsmenn: (ta ogsa med)

SVAR

1. Det vanlege ord i Trysil er: "et bryne" "å bryne"

"Hen" (ei) er det vanleg å si om bryner. I eldre tid var det bryne "henner" til øks og kniv. Namnet har det sikkert fått etter finnestedet: oppmed ei lita fjella i herredsgrensa mellom disse bygdene.

var godt nok til det bruket. Disse bryner var av en vakker blåfarget natur-sandstein fra Rørostrakta De siste 25 år er de blitt borte. I Engerdalen og Trysil er det senere mye blitt brukt "Rødals-hener" til øks og kniv. Namnet har det sikkert fått etter finnestedet: oppmed ei lita fjella i herredsgrensa mellom disse bygdene.

was goodt make this set bucket. Disas bryner var av en vakker blåfarget natur-sandstein fra Rørostrakta De siste 25 år er de blitt borte. I Engerdalen og Trysil er det senere mye blitt brukt "Rødals-hener" til øks og kniv. Namnet har det sikkert fått etter finnestedet: oppmed ei lita fjella i herredsgrensa mellom disse bygdene.

krifta er etter eiga røynsle.: C etter andre heimsmenn: (ta ogsa d, yrke)::

i Trysil er: "[et bryne]" "[å bryne]" (ljåen, øksa o.s.v.) "[Hen]" (ei) er det vanlig å si om øks- og kniv-bryner. I eldre tid var det bare "[blå-hen]" som var godt nok til det bruket. Disse brynerne var av en vakker blåfarget natur-sandstein fra Rørostrakta. De siste 25 år er de blitt borte. I Engerdalen og Trysil er det senere mye blitt brukt "Rødals-hener" til øks og kniv. Namnet har det sikkert fått etter finnestedet: oppmed ei lita fjella i herredsgrensa mellom disse bygdene.

From “Transformer-Based Models for Metadata Creation”, Peter Broadwell & Peter Leonard, DCMI 2023, Daegu, Korea

Victoria & Albert Museum “Compariscope”: Constable’s Hadley Castle

YALE CENTER FOR BRITISH ART Search this site >

Collections Exhibitions Calendar Research Education Architecture Visit About Us | News | Get Involved

Home -> Collections -> Search -> Hadleigh Castle

Search Details

Creator John Constable, 1776–1837, British

Title Hadleigh Castle

Alternate Title(s) Sketch of Hadleigh Castle
Verso: Study of Five Horned Cattle
Il Castello di Hadleigh

Date 1828 to 1829

Medium Oil on millboard

Dimensions 7 7/8 x 9 7/16 inches (20 x 24 cm) Frame: 10 1/2 x 12 inches (26.7 x 30.5 cm)

Credit Line Yale Center for British Art, Paul Mellon Collection

Accession Number B2001.2.141

Collection Paintings and Sculpture

Link to This Record <http://collections.britishart.yale.edu/vufind/Record/1668069>

Subject Terms architecture | birds | castle | clouds | impasto | landscape | Medieval | meteorology | Norman | ocean | rock | Romantic | ruins | science | sky | storm | tower (building division) | wind

Place Represented England | Essex | Europe | Hadleigh | Hadleigh Castle | Thames | Thames Estuary | United Kingdom



cropped to image, recto, unframed
Public Domain | [Zoom](#) | [Download](#)



[Request additional photography](#)



V&A Search the Collections Search 1,183,186 objects and 692,211 images from the V&A's collections
Home Search the Archives Contact Back to V&A Homepage
Last updated: 10 Oct 2017

Search All records Only records with images Best quality records including image and detailed description

More search options

Or are you looking for [Search the Archives?](#)

Hadleigh Castle, near Southend

Object: Drawing

Place of origin: England (made)

Date: 1814 (made)

Artist/Maker: John Constable, born 1776 - died 1837 (artist)

Materials and Techniques: Pencil

Credit Line: Given by Isabel Constable, daughter of the artist

Museum number: D.234-1888

Gallery location: Prints & Drawings Study Room, level C, case MB2A, shelf DR83

More information

Physical description
Page from a sketch book. Pencil drawing of Hadleigh castle.

Place of Origin
England (made)



Hadleigh Castle, near Southend
John Constable, born 1776 - died 1837

[Enlarge image](#)



YALE CENTER FOR BRITISH ART Search this site >

Collections Exhibitions Calendar Research Education Architecture Visit About Us | News | Get Involved

Home -> Collections -> Search -> Hadleigh Castle, The Mouth of...

Search Details

Creator John Constable, 1776–1837, British

Title Hadleigh Castle, The Mouth of the Thames--Morning after a Stormy Night

Alternate Title(s) Hadleigh Castle
Il Castello di Hadleigh

Date 1829

Medium Oil on canvas

Dimensions 48 x 64 3/4 inches (121.9 x 164.5 cm) Frame: 59 1/2 x 76 1/4 inches (151.1 x 193.7 cm)

Credit Line Yale Center for British Art, Paul Mellon Collection

Accession Number B1977.14.42

Collection Paintings and Sculpture

Curatorial Comment In the famous letter of 23 October 1821 to his friend Archdeacon Fisher, John Constable reported: "I have not been idle and have made more particular and general study than I have ever done in one summer; but I am most anxious to get into my London painting room, for I do not consider myself at work without I am before a six foot canvas" (Constable, "Correspondence", p. 76). To some extent, the scale of Constable's great "six-footer" landscape paintings reflected both his high aspirations for landscape in general, and his desire for professional recognition and financial security. Yet Hadleigh Castle, which comes relatively late in the sequence of six-footers, in 1829, is among

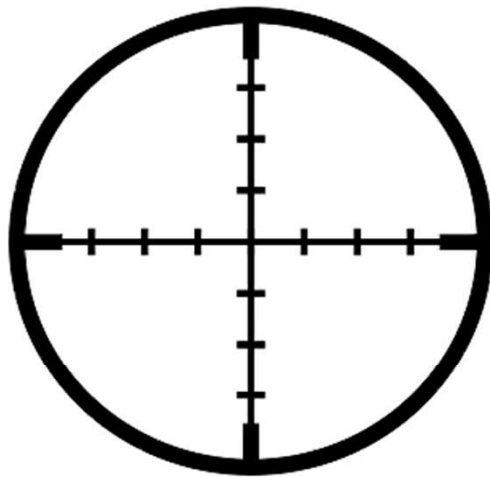


cropped to image, recto
Public Domain | [Zoom](#) | [Download](#)



[Request additional photography](#)





A horizontal toolbar with a white input field on the left containing a cursor 'I', followed by five orange circular icons: a plus sign '+', a minus sign '-', a right-pointing chevron '>', a square, and a refresh symbol.

Preview

Constable – the process



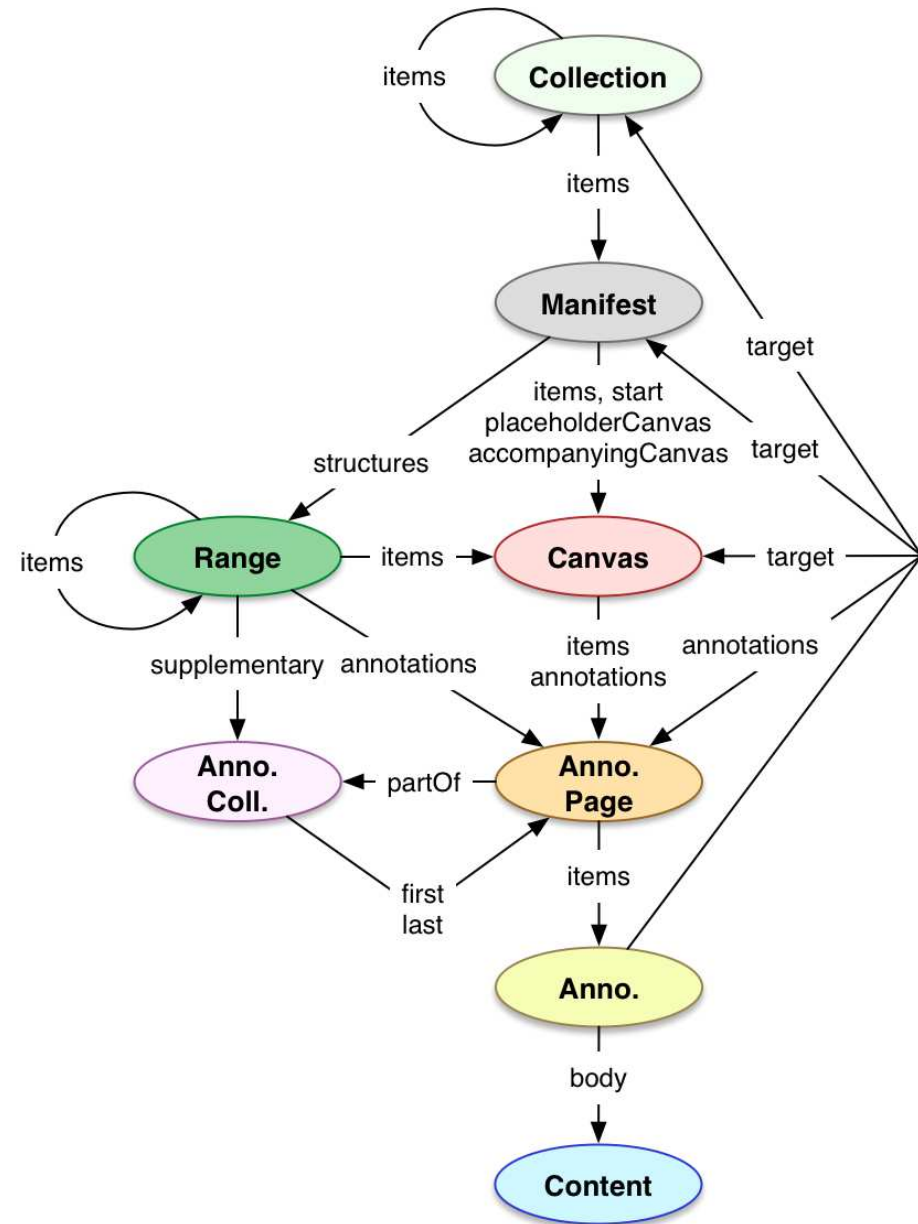
In preparation for the V&A's 2014 major exhibition, 'Constable: Making of a Master' a number of the Museum's oil sketches by John Constable were remounted and reframed. The process revealed many surprising discoveries, including a previously unrecorded work. hidden by an old canvas lining.

SHARE



Presentation API

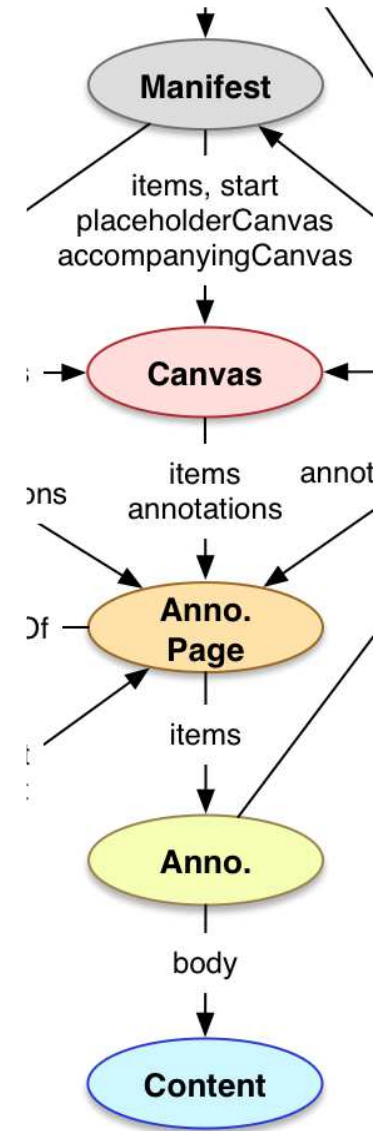
“The objective of the IIF Presentation API is to provide the information necessary to allow a **rich, online viewing environment for compound digital objects to be presented to a human user**, often in conjunction with the IIF Image API.”



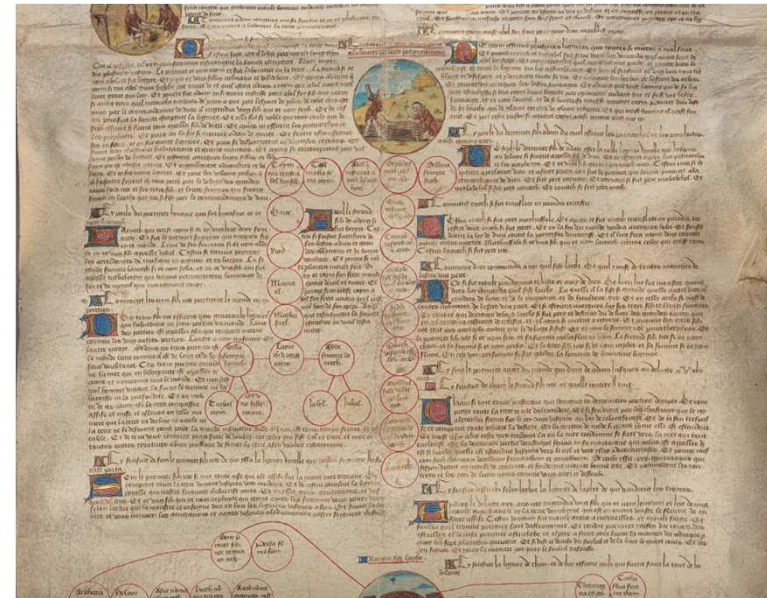
Presentation API

The IIF Manifest contains the data necessary to represent an object.

“**Manifest:** A description of the structure and properties of the compound object. It carries information needed for the client to present the content to the user, such as a title and other descriptive information about the object or the intellectual work that it conveys. Each Manifest usually describes how to present a single compound object such as a book, a statue or a music album.”



Presentation API



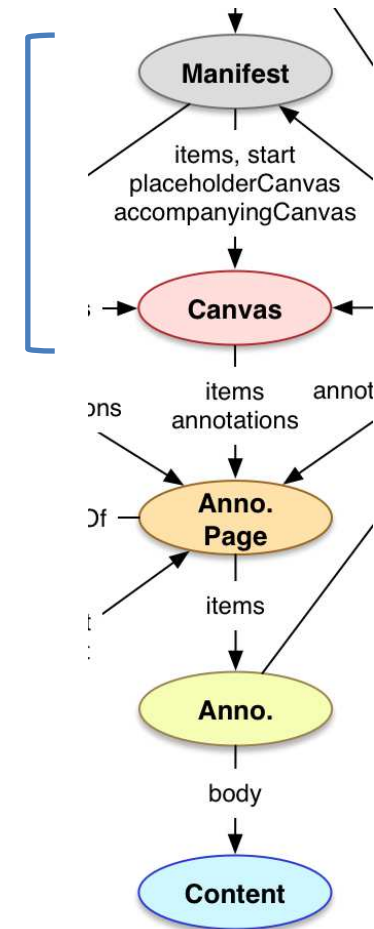
A **Canvas** is a coordinate space with x and y dimensions (width and height) and/or time dimensions (for A/V)

Content is associated with the Canvas via W3C Web Annotations. In this example an image is **painted** onto an x,y region.

Presentation API

A Manifest contains an ordered list of Canvases onto which content is annotated. For example, pages of a book where each page is a Canvas.

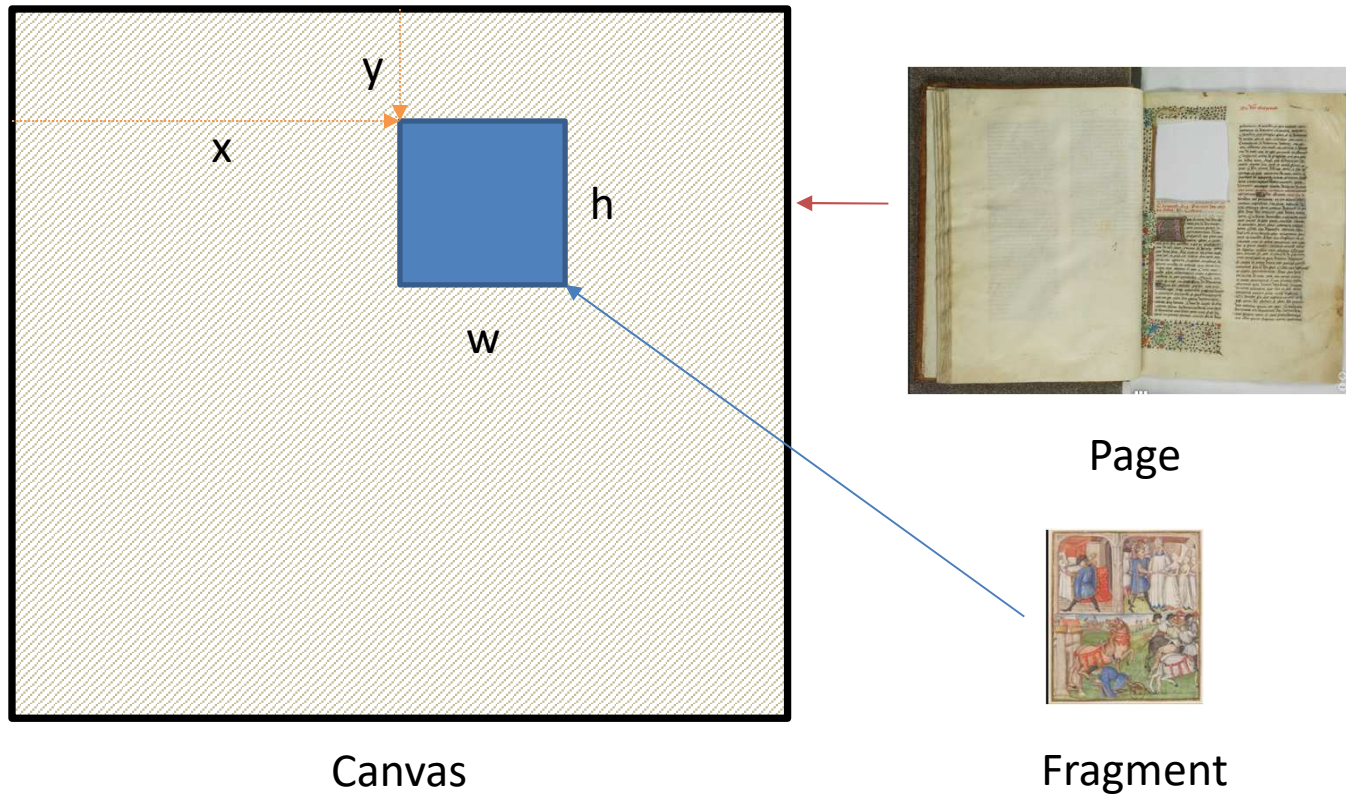
Additional structure may be described with Ranges.



Presentation API: Other Properties

- Descriptive Properties
(label, metadata, summary, rights, provider...)
- Technical Properties
(id, type, width, height, duration, viewingDirection, behavior,...)
- Linking Properties
(homepage, logo, rendering, services, seeAlso, partOf, start, supplementary)
- Structural Properties
(items, structures, annotations)

Presentation API: Reconstruction of a Manuscript Folio



Demonstration: Manuscript Reconstruction

Reconstructed manifest (partial): Grandes Chroniques de France (Châteauroux, BM, ms 5)

Change Layout Full Screen

Index Search Layers

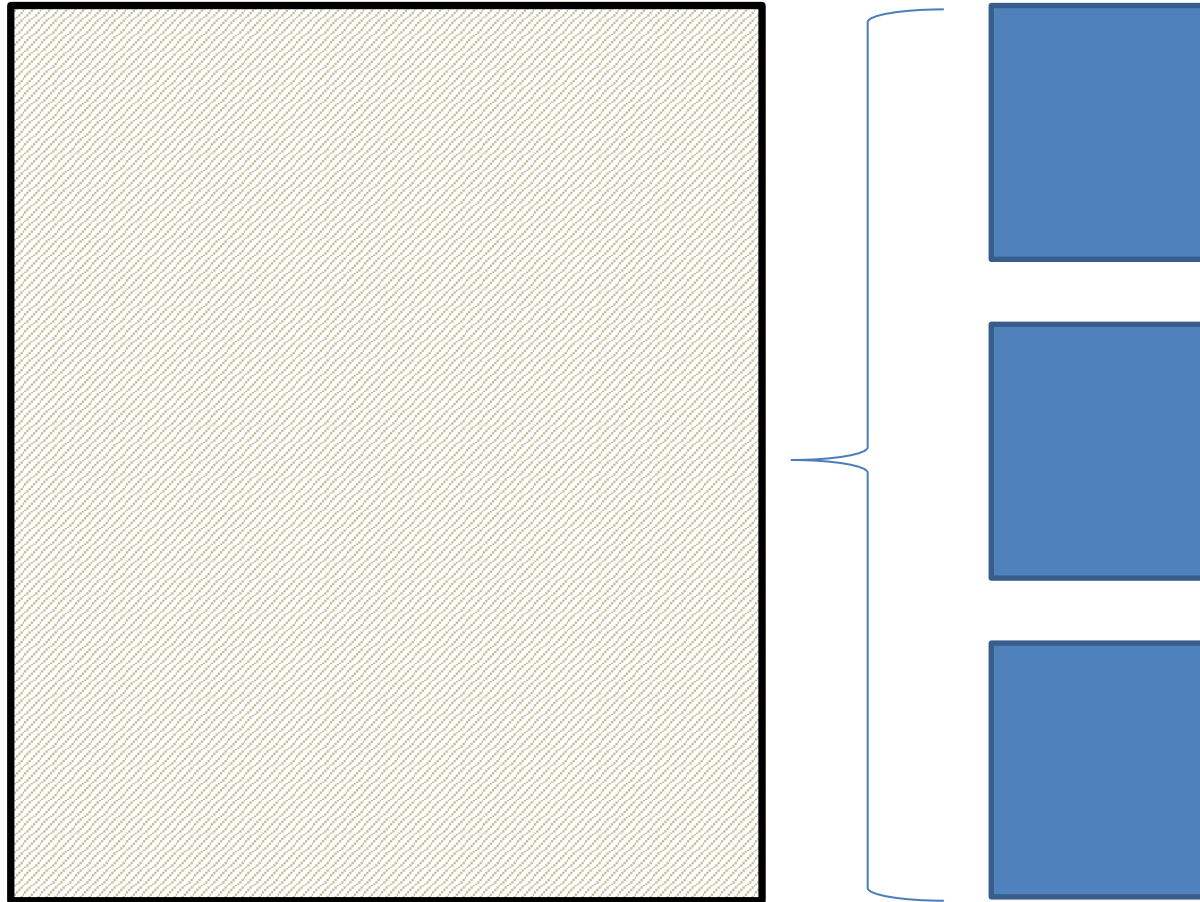
Images for f. 033v - 034

No Label visible opacity (100%)

No Label visible opacity ()

f. 033v - ... f. 034v - ... f. 045v - ... f. 046v - ... f. 053v - ... f. 054v - ... f. 067v - ... f. 068v - ...

Multiple Images on a Single Canvas



Canvas

Images

Demonstration: Multispectral Images

New Haven, Beinecke Rare Book and Manuscript Library, Yale University, Osborn fa1

Change Layout Full Screen

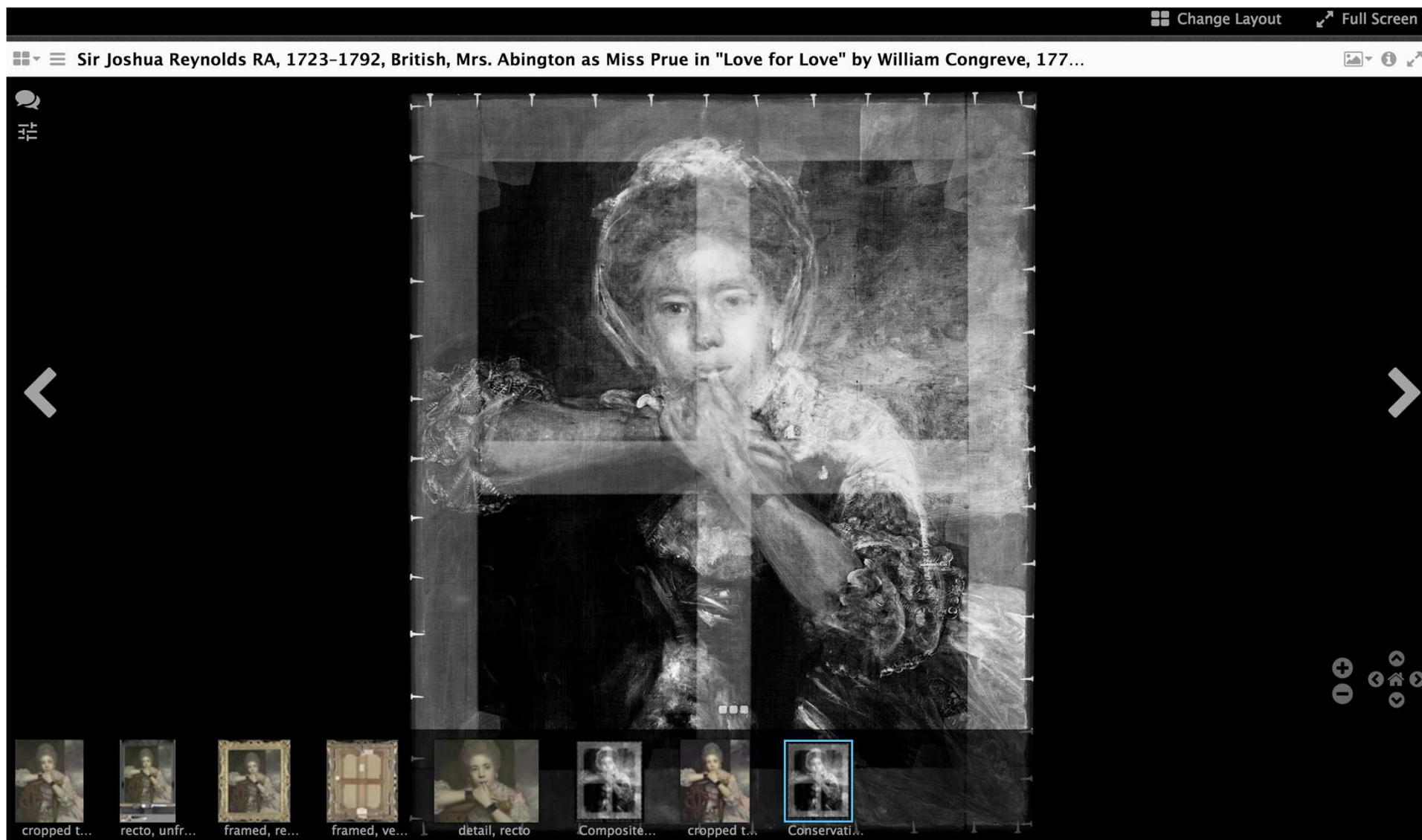
Index Search Layers

Images for Osborn fa1, 53r

- Osborn fa1, 53r
 visible
opacity (100%)
- Osborn fa1, 53r, 1_global_ir_0_1sec_f11_f0_4m
 visible
opacity ()
- Osborn fa1, 53r, 1_global_rgb_0_1sec_f11_f0_4m
 visible
opacity ()
- Osborn fa1, 53r, 1_global_rgb_0_1sec_f11_f0_4m-B
 visible
opacity ()
- Osborn fa1, 53r, 1_global_rgb_0_1sec_f11_f0_4m-G
 visible
opacity ()
- Osborn fa1, 53r, 1_global_rgb_0_1sec_f11_f0_4m-R
 visible
opacity (disabled)
- Osborn fa1, 53r, 1_global_uv_20sec_f11_f0_4m

Yale Center for British Art

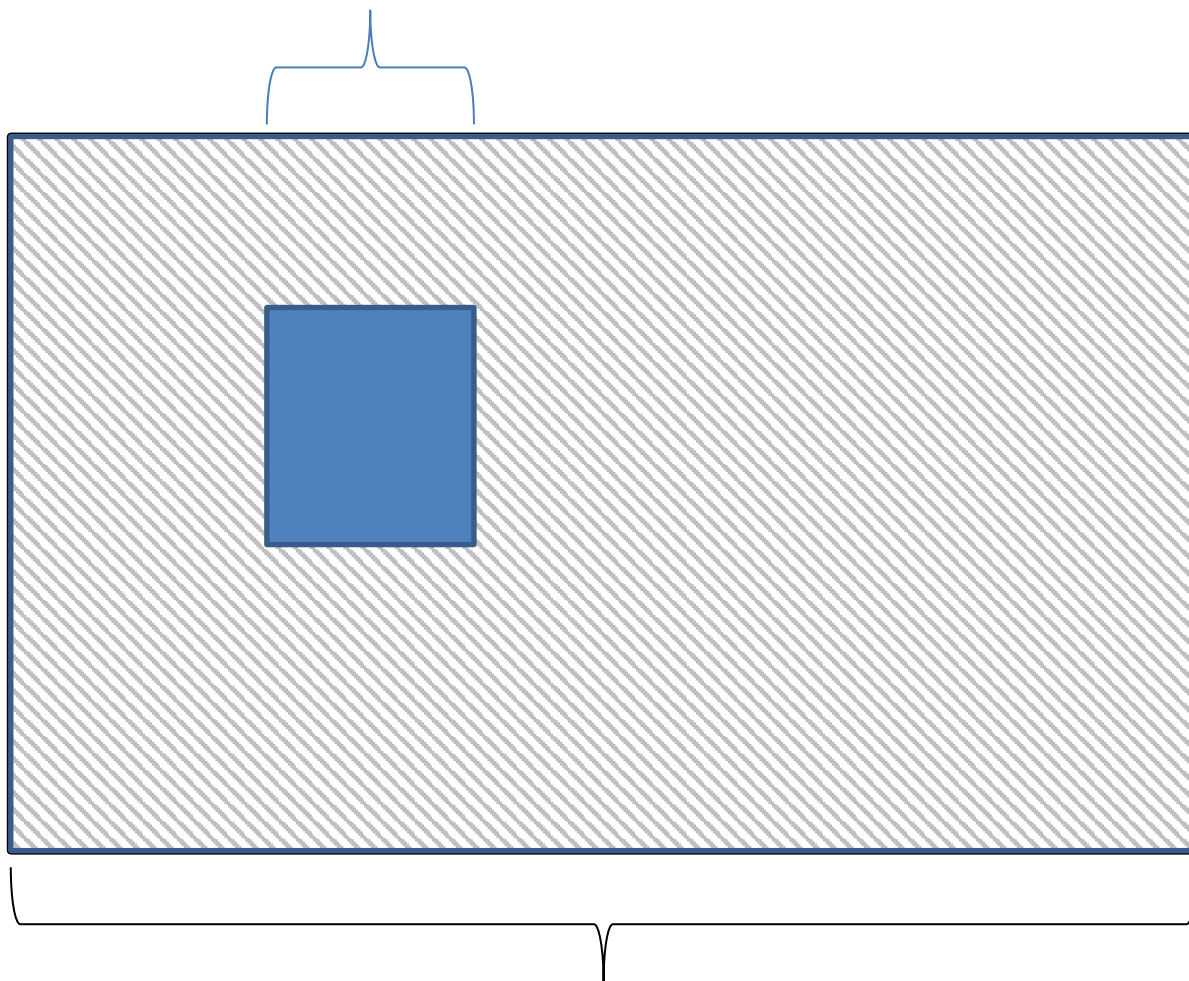
Demonstration: X-Ray and Conventional Photography



Yale Center for British Art

Demonstration: Detail Images and Deep Zoom

Detail image width: 5284 pixels



Base image width: 6258 pixels

Demonstration: Detail Images and Deep Zoom



Yale Center for British Art

No “Audio-Visual API”

- There is no need for a special API like the Image API
- A/V resources with current web standards provide sufficient access mechanism to address and access time slices for use within IIF

Audio-Visual Support

- The IIIF Presentation API v3.0 (2020) expanded the notion of a Canvas from an x,y space by adding a time dimension
- This allows for annotation of audio and video onto the Canvas at specific points in time
- Images, text, and other content can also be annotated on to the Canvas
- The video on the following slide shows the combination of video, still images, and text, all annotated on to a single canvas.



Content Search API

- “Control-F for IIIF Resources”
- API provides search interface over annotation content within a single IIIF resource, such as a Manifest, Canvas, Range or Collection
 - Search – query and constraints in resource context. Good for transcribed/OCR’ed content
 - Autocomplete – typically simple terms within given resource context

Context Search on OCR Text

The screenshot displays a digital library interface with a dark theme. At the top, navigation controls include a back arrow, a search bar containing 'Image 7 of 36', a 'Go' button, and forward arrows. On the left, a 'CONTENTS' sidebar shows a grid of document thumbnails numbered 4, 5, 6, and 7. The main area displays a document page titled 'Wunder der Vererbung / von Fritz Bolle.' The text on the page is in German, with the word 'wunder-' highlighted in blue. A vertical 'MORE INFORMATION' sidebar is on the right. At the bottom, a search bar shows '19 results found for 'wunder' Clear', with 'Previous Result' and 'Next Result' buttons. A page indicator shows 'page 5 of 31' with a water drop icon. The bottom left has download and share icons, and the bottom right has a full-screen icon.

Image 7 of 36 Go

CONTENTS

Index Thumbnails

4 5 6 7

Wunder der Vererbung / von Fritz Bolle.

ungeklärt. Und wie gar aus
mit dem sich nun auch noch
wachsenes Lebewesen erste-
tet — das schien so wunder-
immer ein unlösbares Rätsel
eimnissen des Erbguts schon

MORE INFORMATION

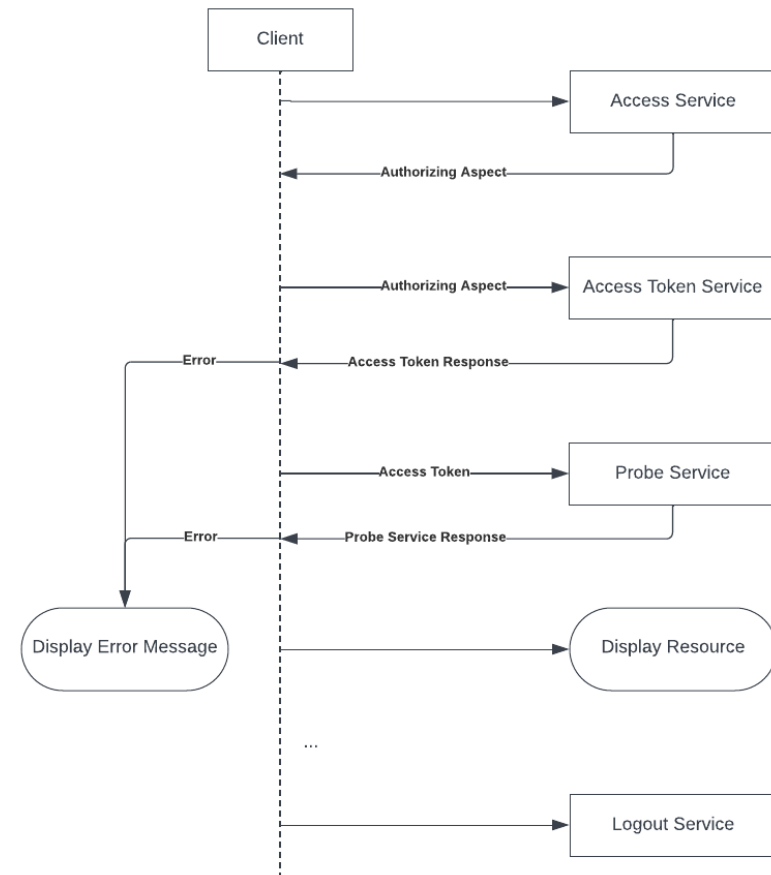
page 5 of 31

19 results found for 'wunder' Clear

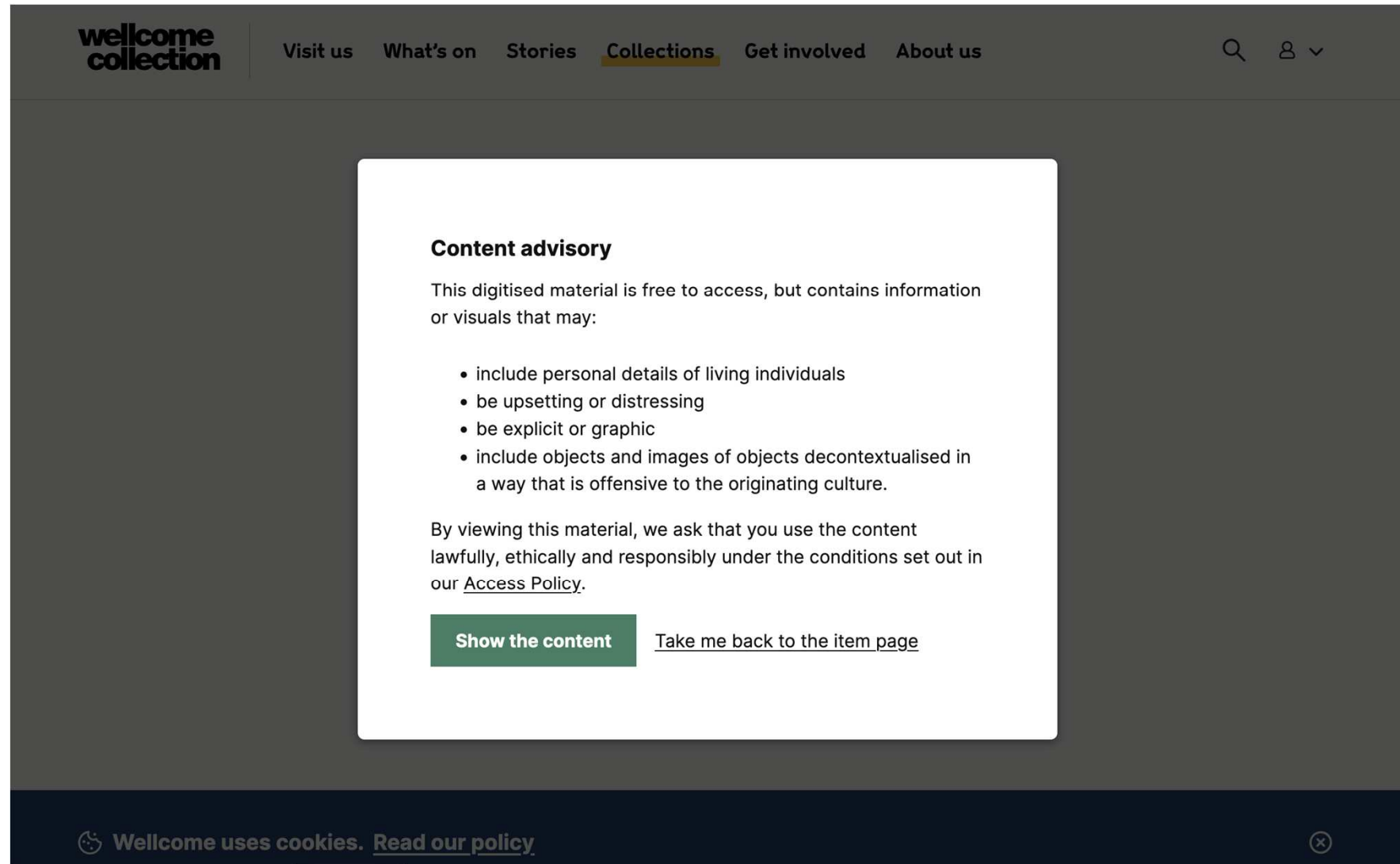
Previous Result Next Result

Authorization Flow API

- Formerly “Authentication API”
- Describes services and pattern that allow the client to **guide the user through existing access control systems**
- Authenticating and authorizing the user is out of scope and may involve a round-trip to a CAS server, or an OAuth2 provider, or a bespoke login system



Clickthrough @ Wellcome



The screenshot shows the Wellcome Collection website with a dark grey header. The logo 'wellcome collection' is on the left. The navigation menu includes 'Visit us', 'What's on', 'Stories', 'Collections' (highlighted), 'Get involved', and 'About us'. On the right, there are icons for search, user profile, and a dropdown arrow.

Content advisory

This digitised material is free to access, but contains information or visuals that may:

- include personal details of living individuals
- be upsetting or distressing
- be explicit or graphic
- include objects and images of objects decontextualised in a way that is offensive to the originating culture.

By viewing this material, we ask that you use the content lawfully, ethically and responsibly under the conditions set out in our [Access Policy](#).

[Show the content](#) [Take me back to the item page](#)

Wellcome uses cookies. [Read our policy](#)



Software

IIIF Compatible Software



Cantaloupe

High-performance dynamic image server in Java

djatoka



mirador

cogapp



IIPImage



OpenSeadragon



casalini
libri



ult



4SCIENCE

Share your knowledge

mlol

Leaflet

divajs

tb text & bytes

4SCIENCE

Share your knowledge

CONTENTdm®

GallerySystems
Collect. Manage. Share.

netx



awesome

IIIF / awesome-iiif

dhlab-basel / Sipi

Veridian

TIFY



LUNA IMAGING



quartex
create digital collections

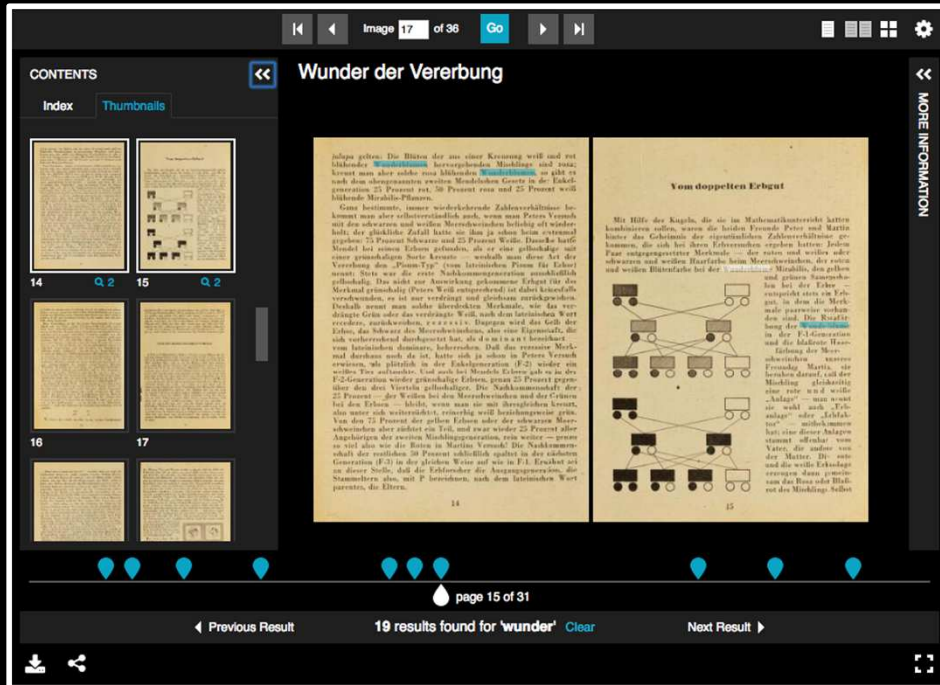
Archival IIIF

kakadu software

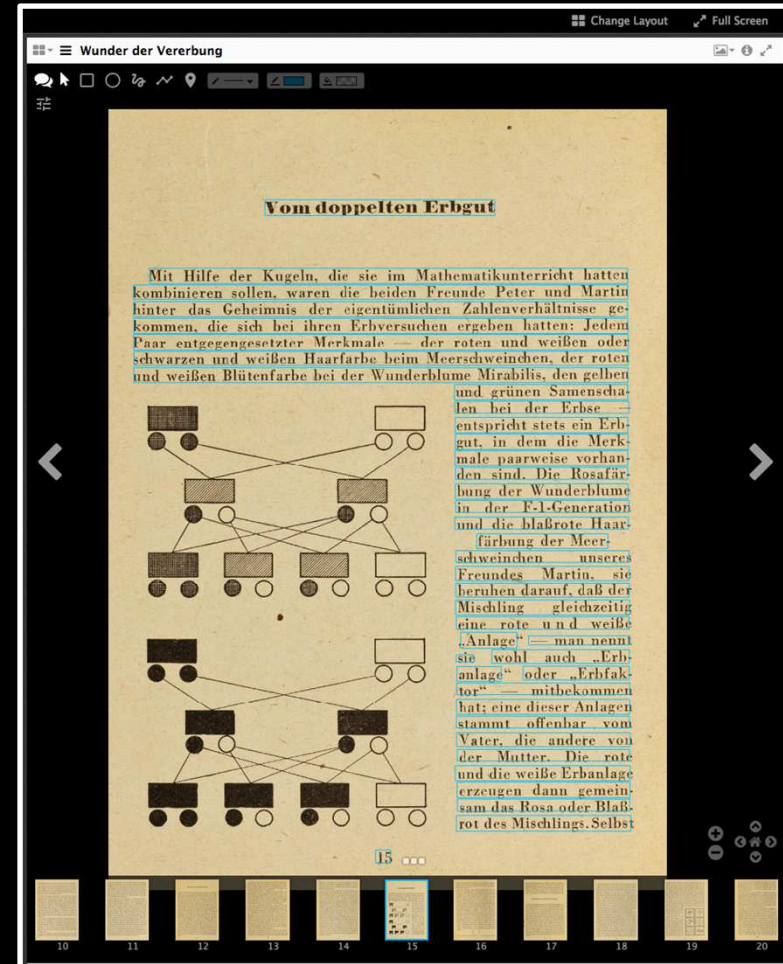
IIIF Curation Viewer

TIND

IIIF lets you choose the application



Universal Viewer



Mirador

The logo consists of the letters 'U' and 'V' in a white, sans-serif font. The 'U' is a simple, rounded shape, and the 'V' is a simple, pointed shape. They are positioned side-by-side.

Universal Viewer

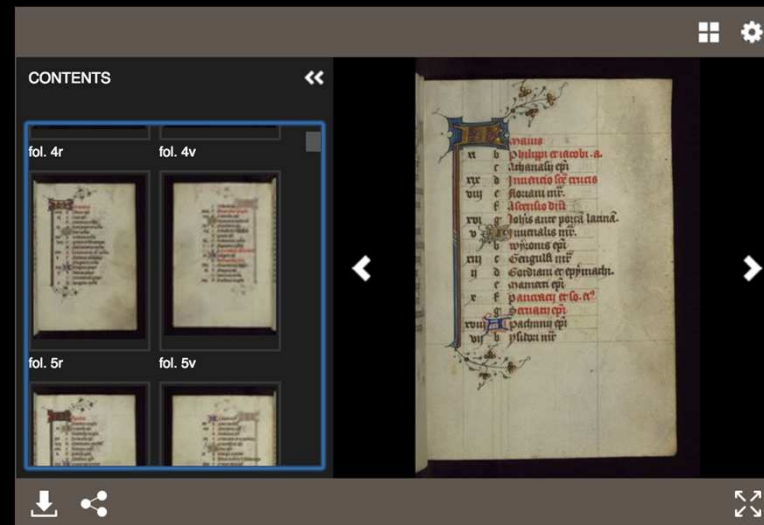


mirador

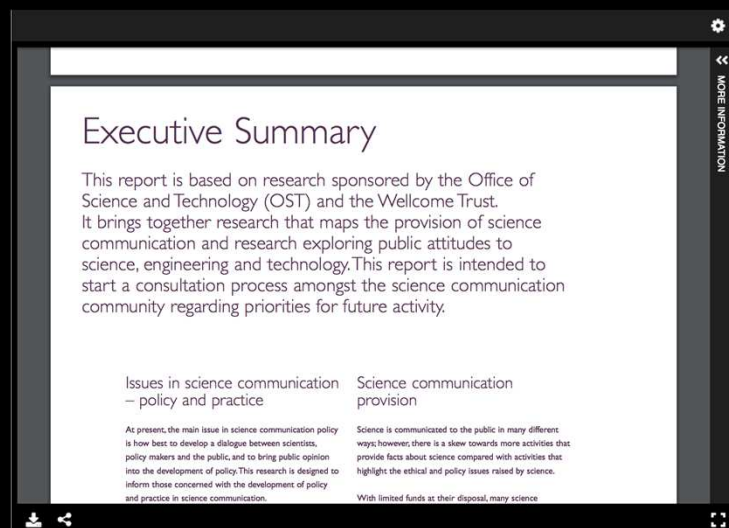
Universal Viewer = Uniform
presentation
for many
formats



Simple Image Viewer



Book / Manuscript Viewer



PDF Viewer



Audio/Video Player

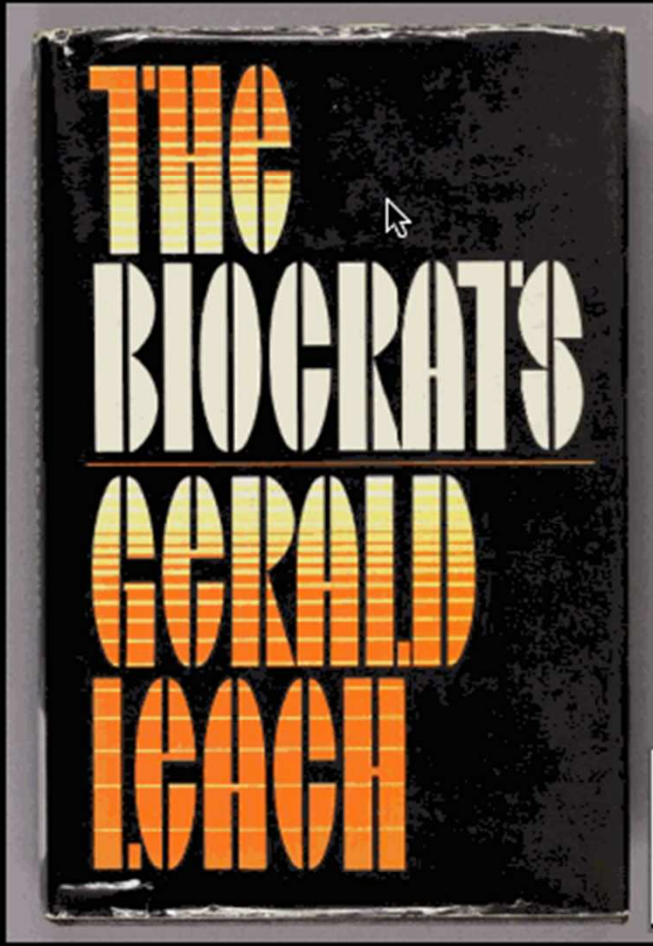
CONTENTS <<

Index Thumbnails



The biocrats

+ - ↻



MORE INFORMATION <<

page - of 317

Search within this item:





MORE INFORMATION



hc941fm6529

+ -

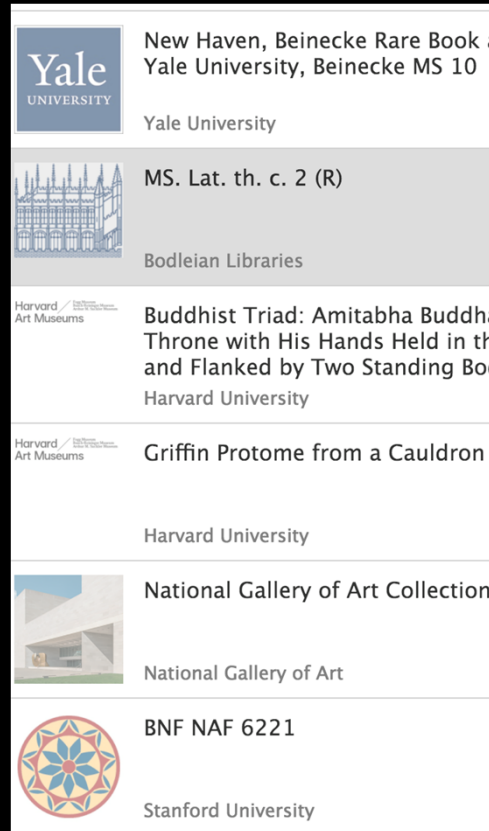


ATTRIBUTION ×
Stanford University

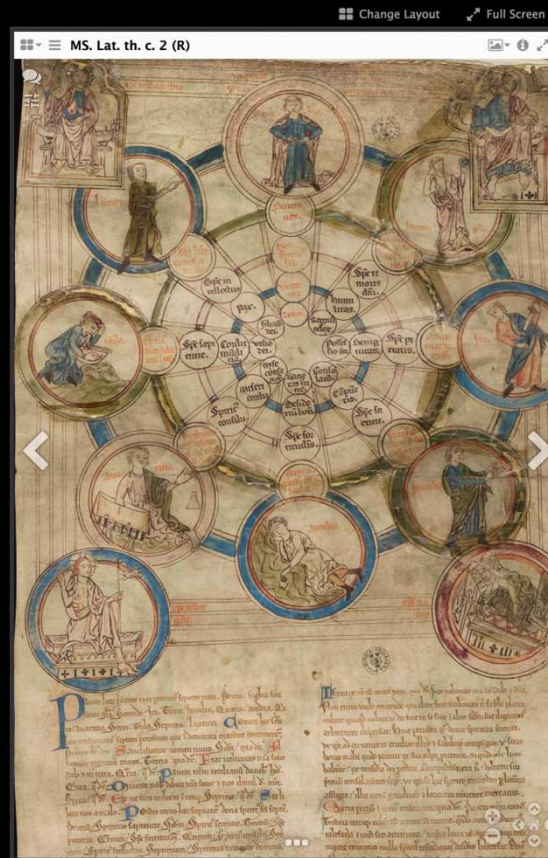


Mirador = One or more
objects:
comparison,
annotation

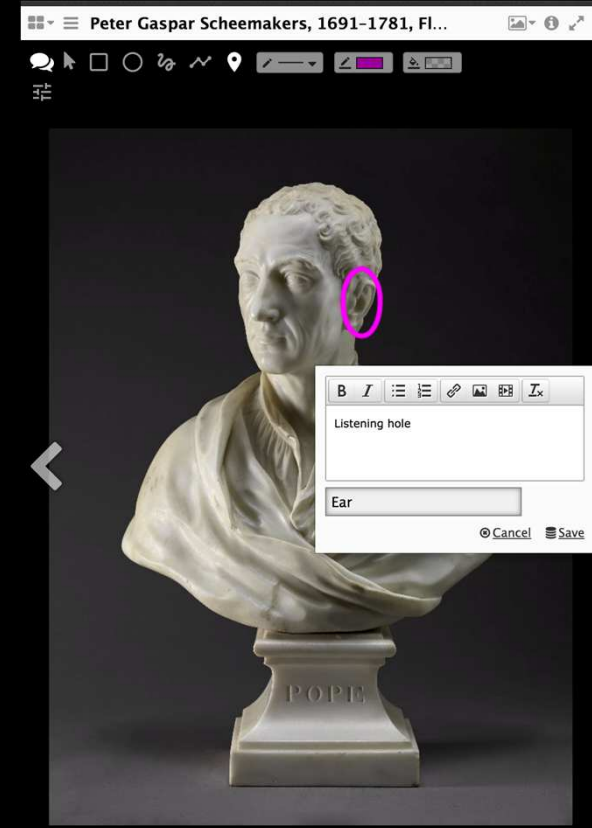
Mirador: 3 Primary Functions



Load



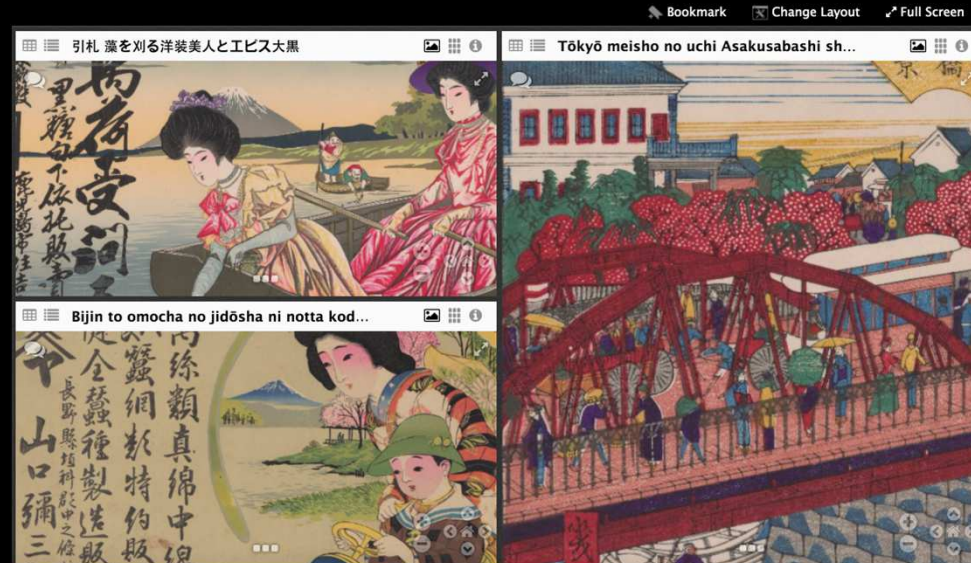
View



Annotate

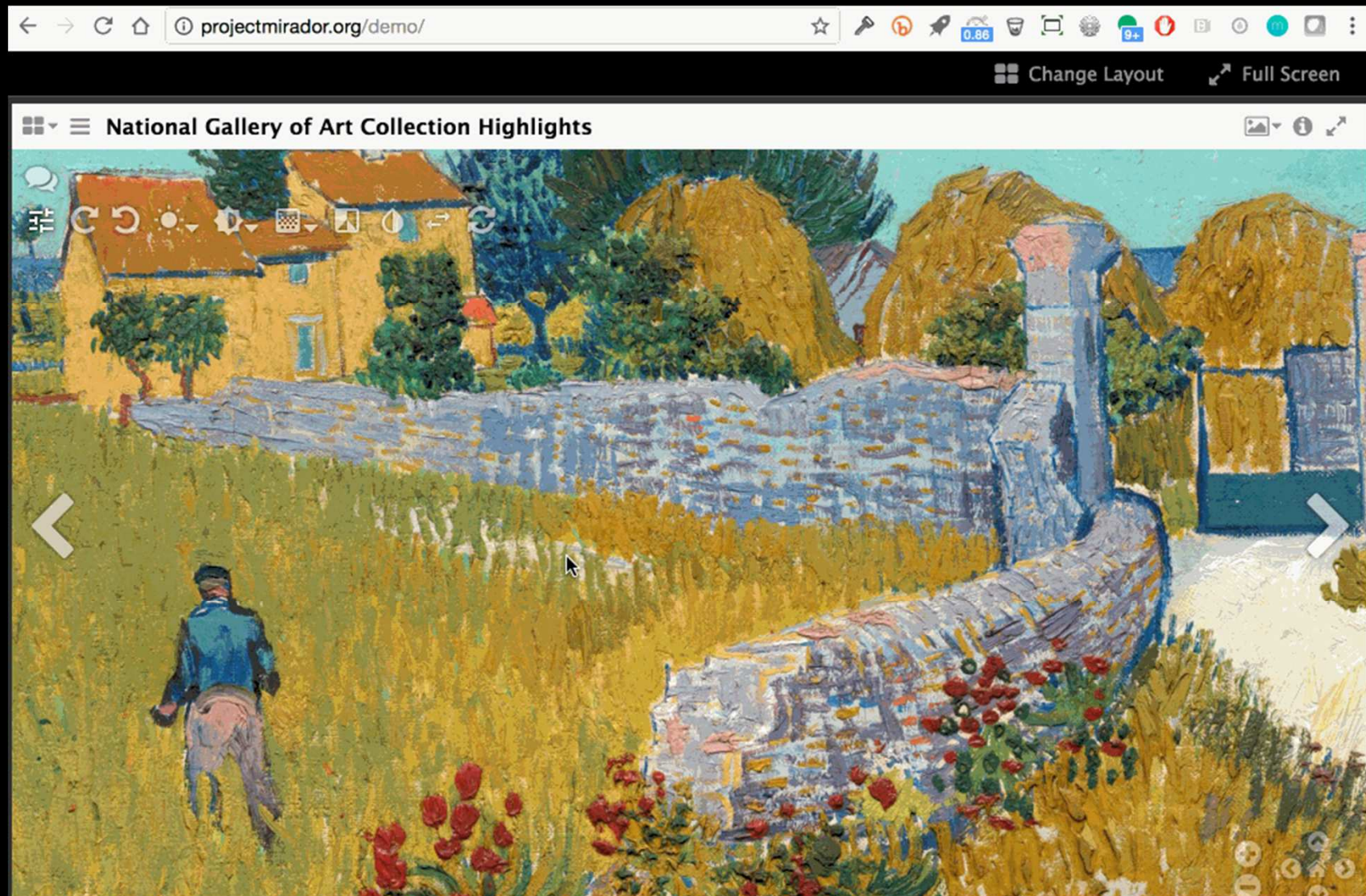
How people are using Mirador...

- Viewing
- Comparison
- Annotation
- Transcription
- Unification
- Computational imaging
- Teaching
- Research
- Exhibits

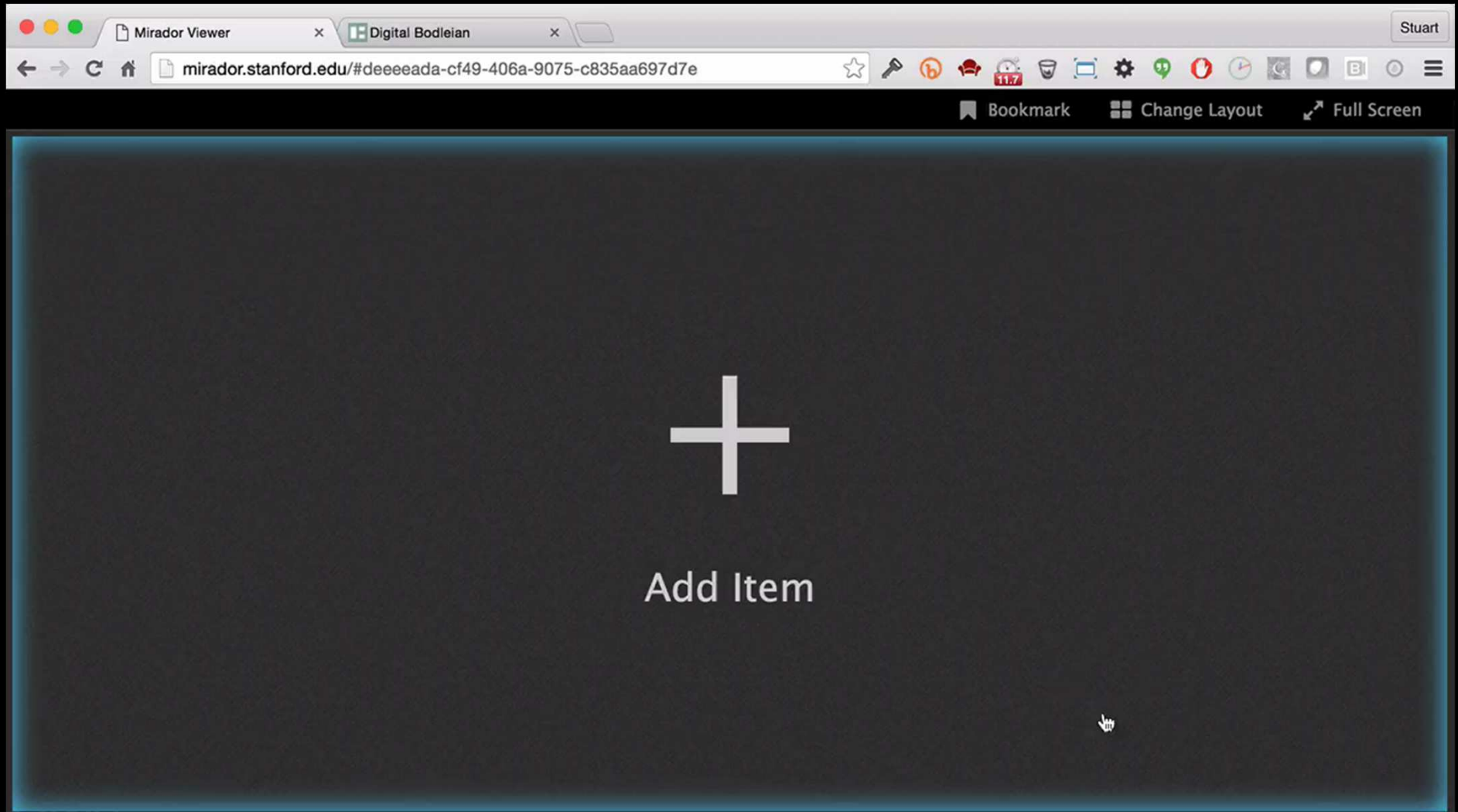


- *Embedded*
- *Stand Alone*
- *Scholars Workbench*

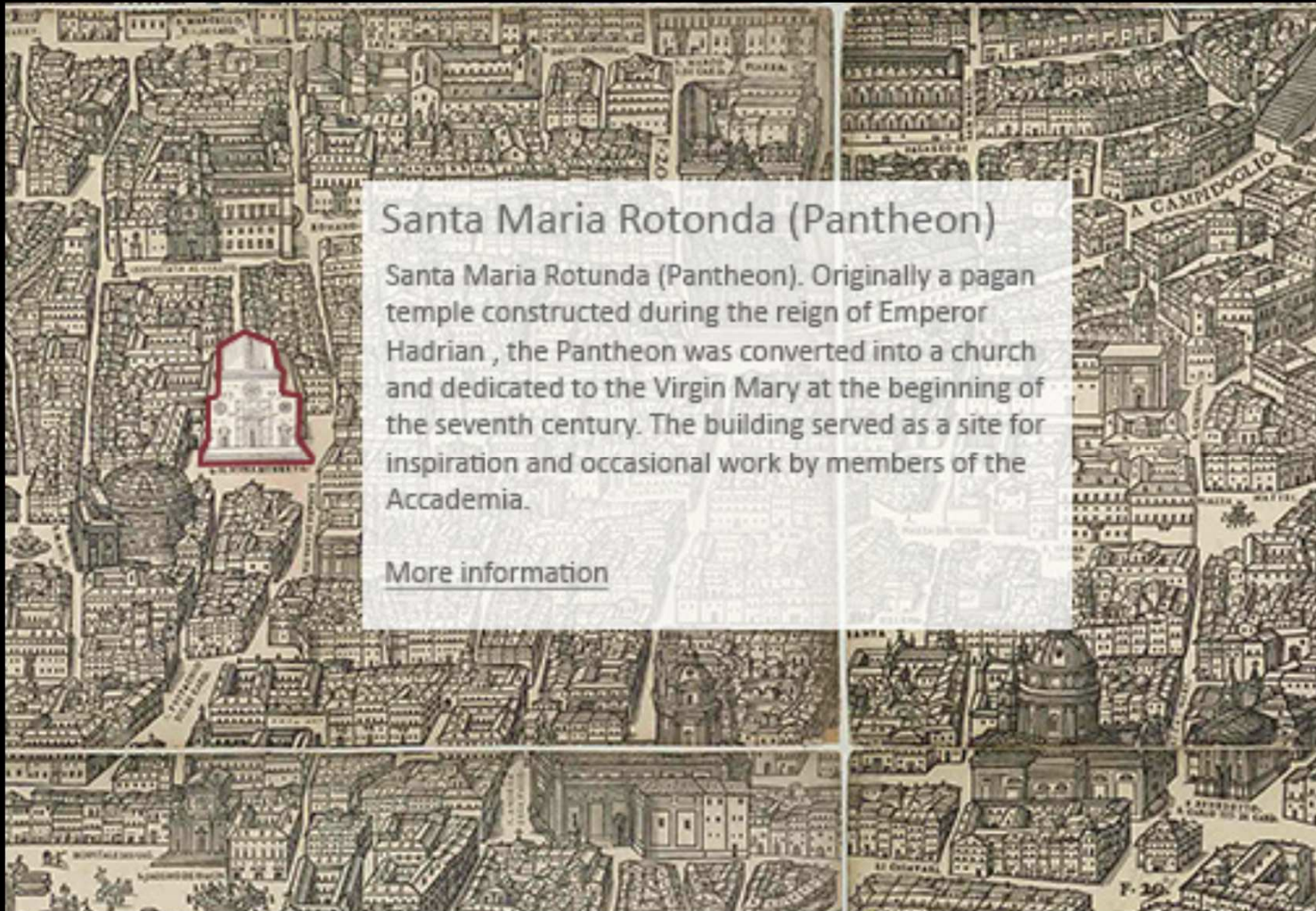
Zoom and analyze images



Compare & Contrast



Annotate

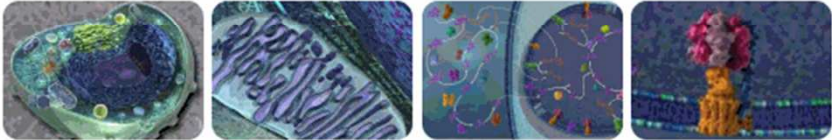


Annotate

Course [CellXplorer](#) [Syllabus and FAQs](#)

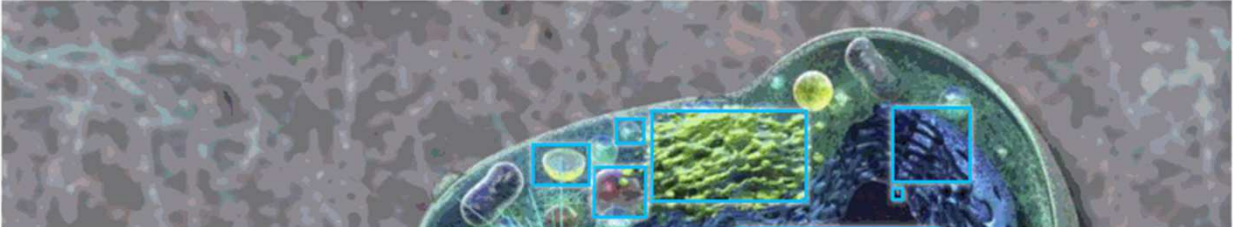
CellXplorer is an interactive and annotated graphic that you can navigate. You can click on the buttons below to zoom in. As each week's content becomes available, you can also navigate to the lesson associated with that part of the cell! The graphic below can sometimes take some time to load.

Support

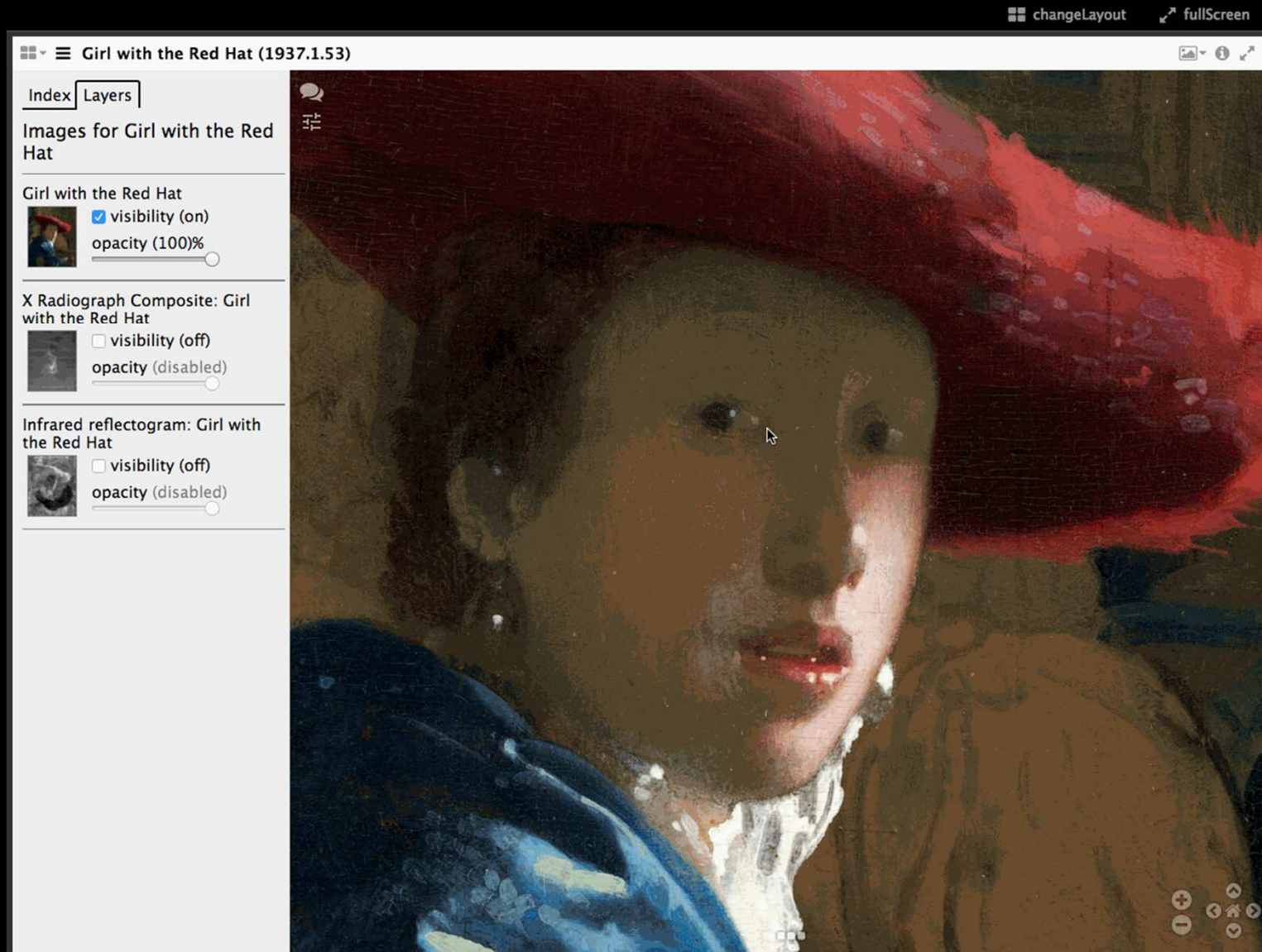


Show Annotation List

CellXplorer (eukaryotic and prokaryotic cells)



Analyze layers



Vermeer's Girl with the Red Hat, from the National Gallery of Art (US)

Right-to-left reading (thanks to Kiyonori Nagasaki!)

The screenshot shows a web browser window with the URL `projectmirador.org/demo/`. The browser's address bar and navigation icons are visible at the top. Below the browser window, a web application interface is shown. The top navigation bar contains a hamburger menu icon, the text '唐系草紙', and icons for image, information, and share. The main content area displays a document with the following text:

NIKI - 099-0014

書名 唐系草紙

写 2冊

所蔵者 国文学研究資料館

(備考)

図号 99 - 14

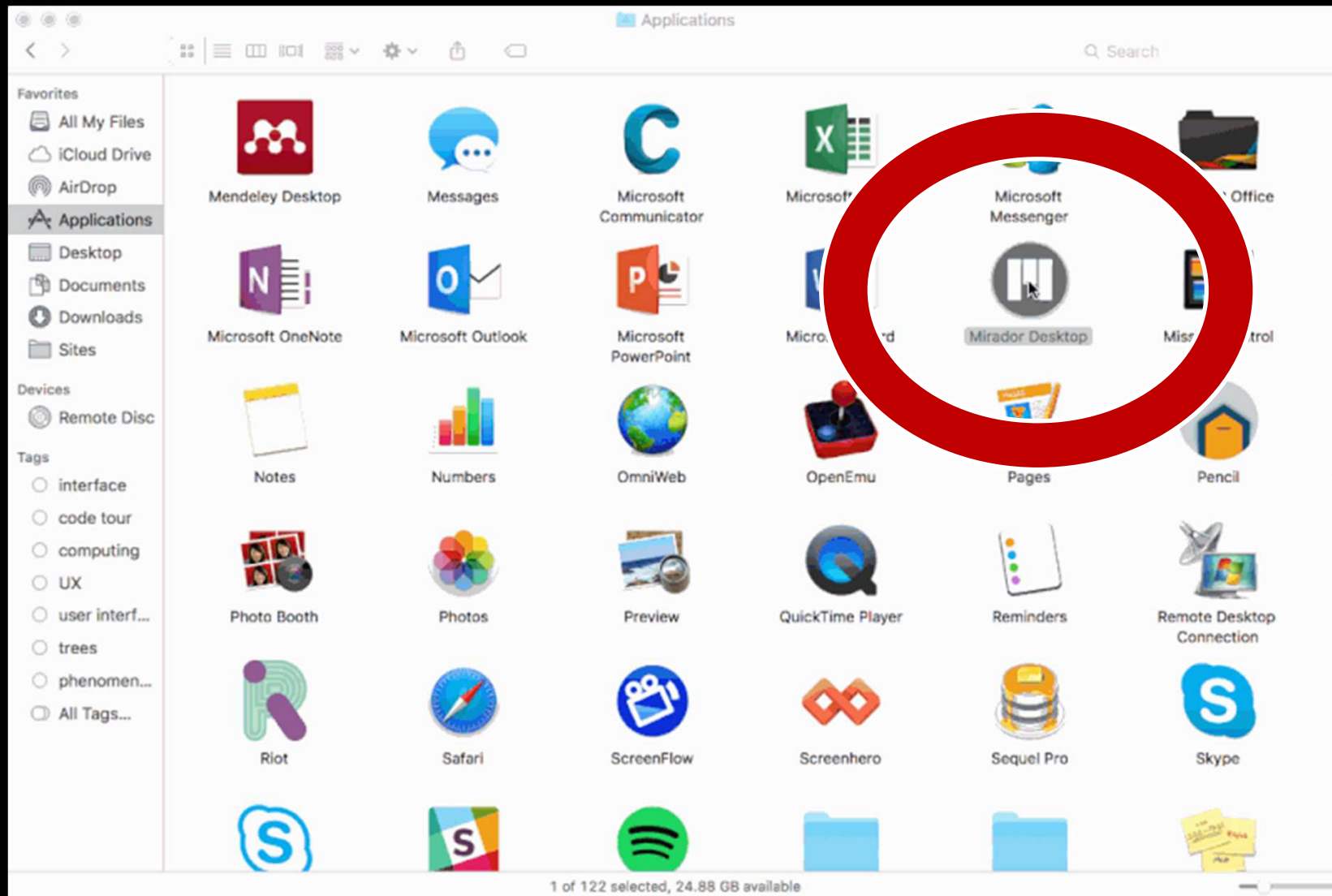
撮影 (株)ニテマイ
東京都文京区本郷 1-10-9 TEL 03-3815-1231

平成 年 月

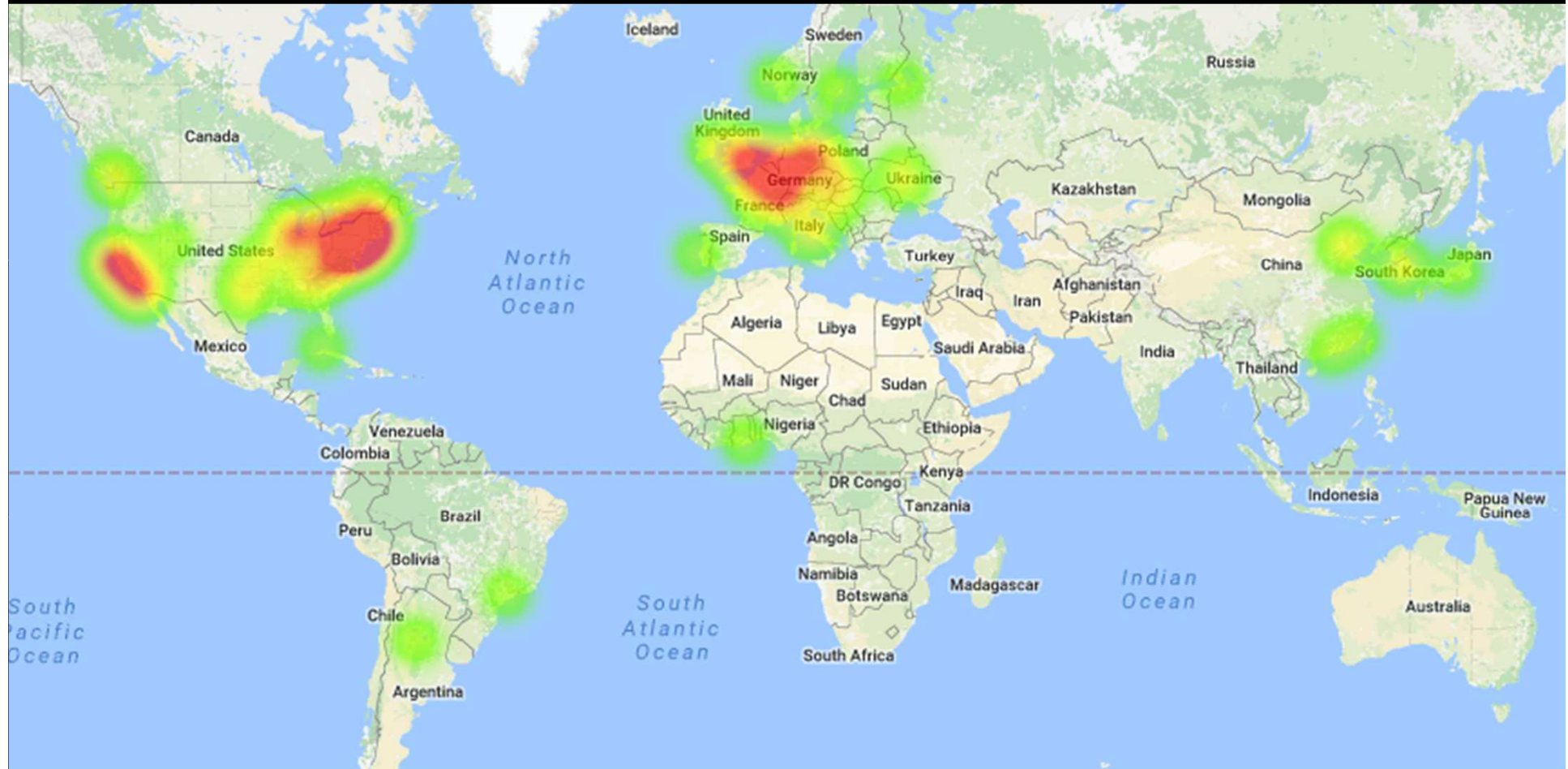
国文学研究資料館

The interface is designed for right-to-left reading, with a large left-pointing arrow on the left side of the document area. The browser window also shows 'Change Layout' and 'Full Screen' buttons.

Mirador Desktop



Mirador Github Activity Worldwide



<http://jrvis.com/red-dwarf/?user=projectmirador&repo=mirador>

Mirador Contributions

In a Nutshell, mirador...

... has had 1,777 commits made by 45 contributors representing 63,941 lines of code

... is mostly written in JavaScript with an average number of source code comments

has a young, but established codebase maintained by a very large development team with stable Y-O-Y commits

... took an estimated 16 years of effort (COCOMO model)

starting with its first commit in April, 2014 ending with its most recent commit 6 months ago

<https://www.openhub.net/p/mirador>

- Stanford
- Harvard
- National Gallery of Art
- Yale University
- UCLA
- BnF/Biblissima
- BSB
- University of Tokyo
- University of Toronto
- St. Louis University
- The Frick
- Johns Hopkins
- Hill Museum & MS Lib
- Sirma
- *Et al.*



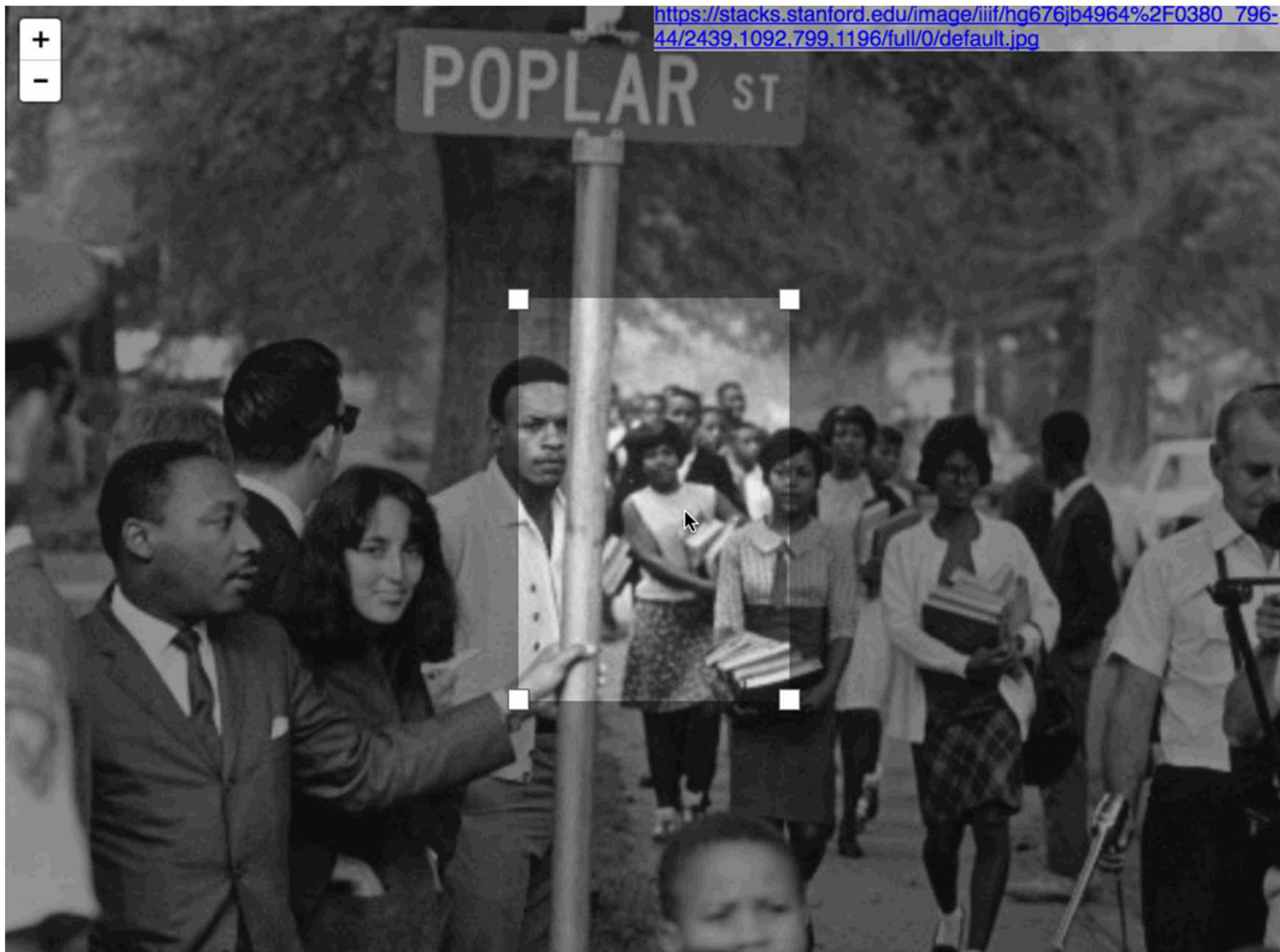
- Leaflet-IIIIF is JavaScript plugin for the interactive map library Leaflet
- Leaflet has
 - Very light weight < 40Kb & great browser compatibility
 - Excellent accessibility & mobile support
 - No external dependencies
 - More than [400 plugins](#)
- <https://github.com/mejackreed/Leaflet-IIIIF>

Leaflet-IIIF - Basic example



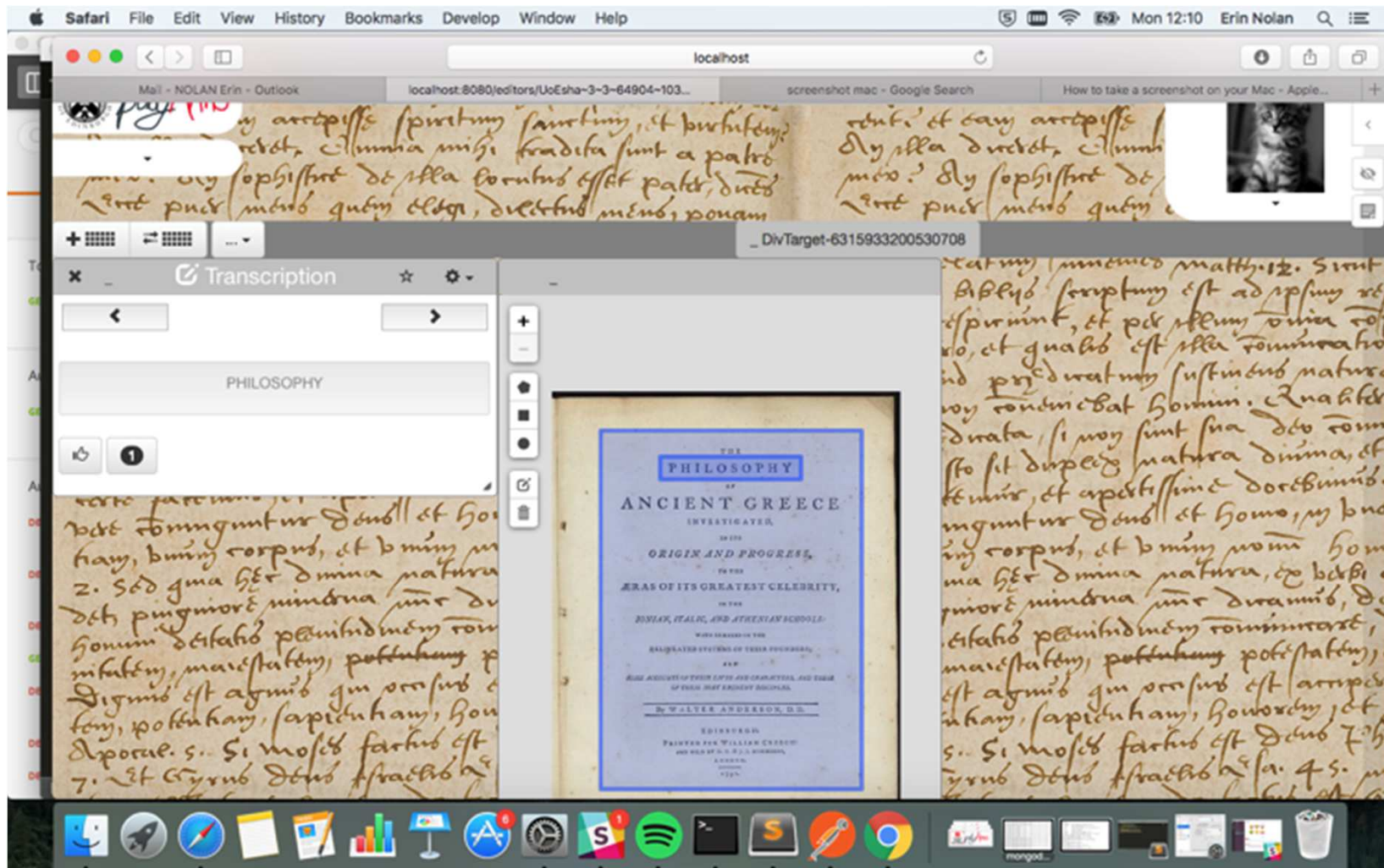
<https://bl.ocks.org/mejackreed/b0aba2ff6f5a54f197767313fbc5a26e>
bit.ly/leaflet-iiif-basic

Cropping images using Leaflet-IIIF



<https://bl.ocks.org/mejackreed/6936585f435b60aa9451ae2bc1c199f2>

Leaflet-IIIF with PolyAnno



<https://pigeonsblue.com/2016/08/22/polyanno-adventures-in-annotation/>

<https://github.com/IIIF/awesome-iiif>

Awesome International Image Interoperability Framework (IIIF)

A list of lists of awesome IIIF resources.

The International Image Interoperability Framework (IIIF) is a group of standard APIs around sharing and reuse of media. It is also a growing community of galleries, libraries, archives, museums, companies, and others who develop the standards and interoperable software implementations. Content includes helpful links around each of the standards, demonstrations of their use, and tutorials and presentations. The list is especially helpful for orienting new community members and developers.



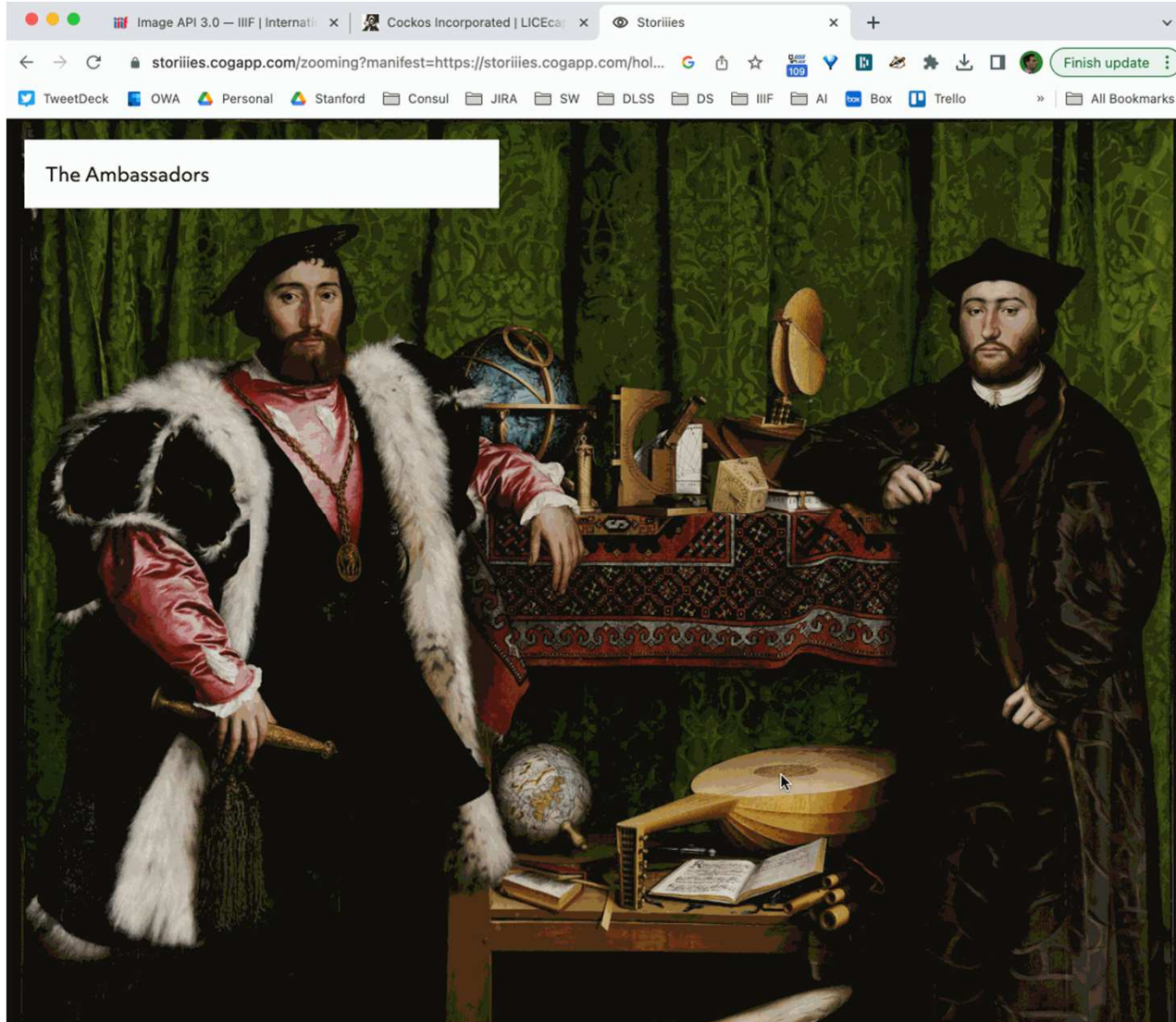
[CONTRIBUTING Guidelines](#)

Disclaimer: This list is created for informational purposes only and any links do not constitute an endorsement, recommendation, or favoring by the IIIF Consortium.

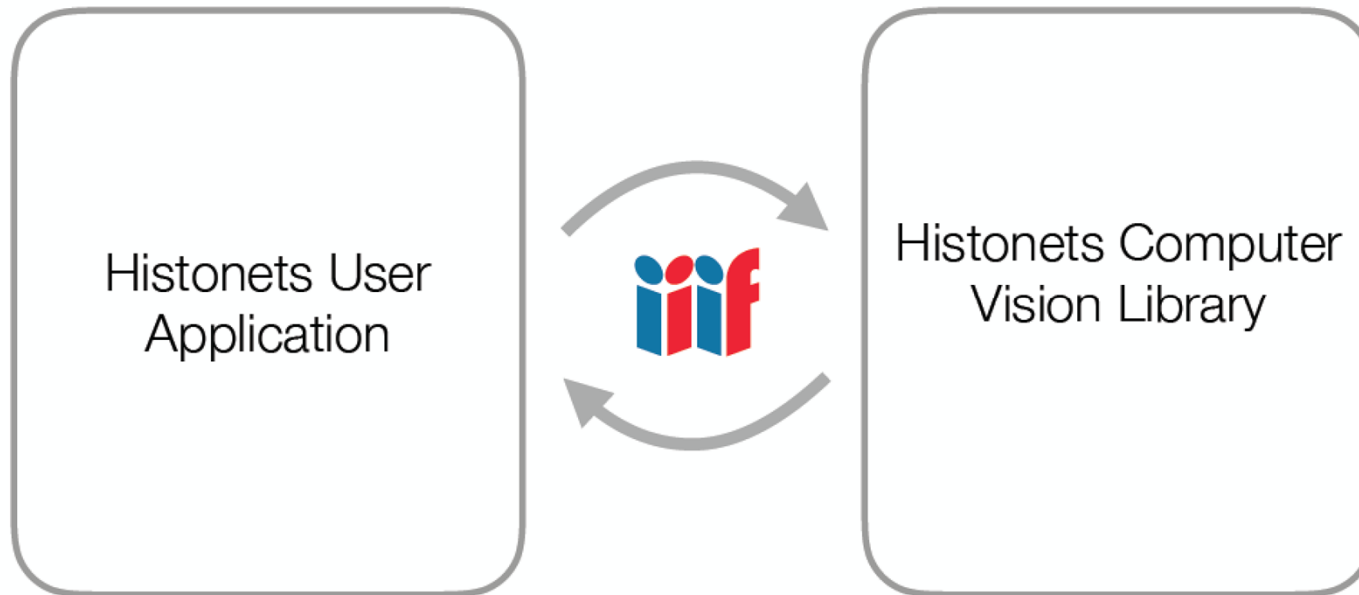
Contents

- [Standards](#)
- [Image Servers](#)
- [Image Server Shims](#)
- [Image Viewers](#)
- [Image API Libraries](#)
- [Image Tools](#)
- [Representation API Libraries](#)

Storiies

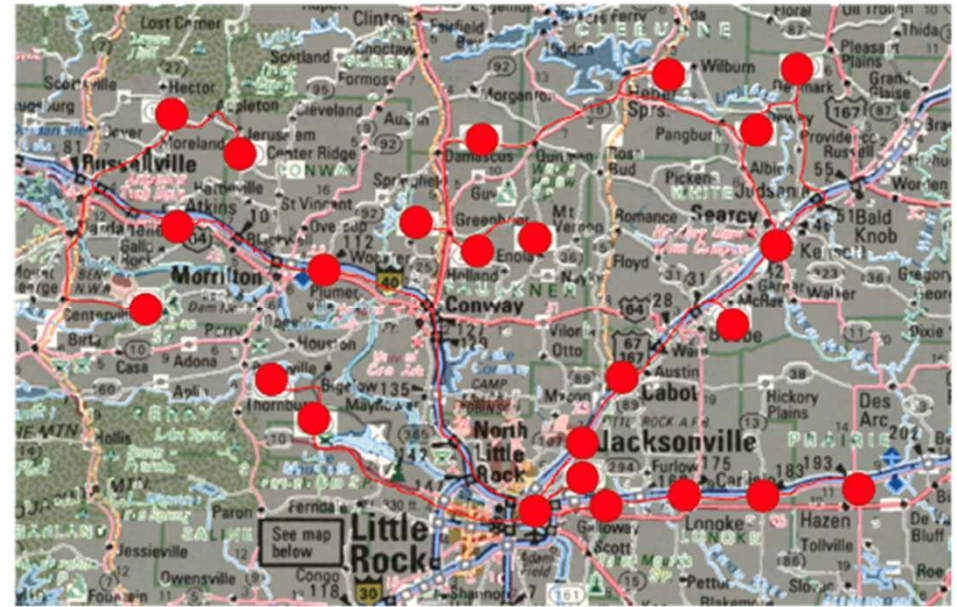


Machine learning and IIF



- 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

Histonets – Computer vision and machine learning with IIF



<https://github.com/sul-cidr/histonets>

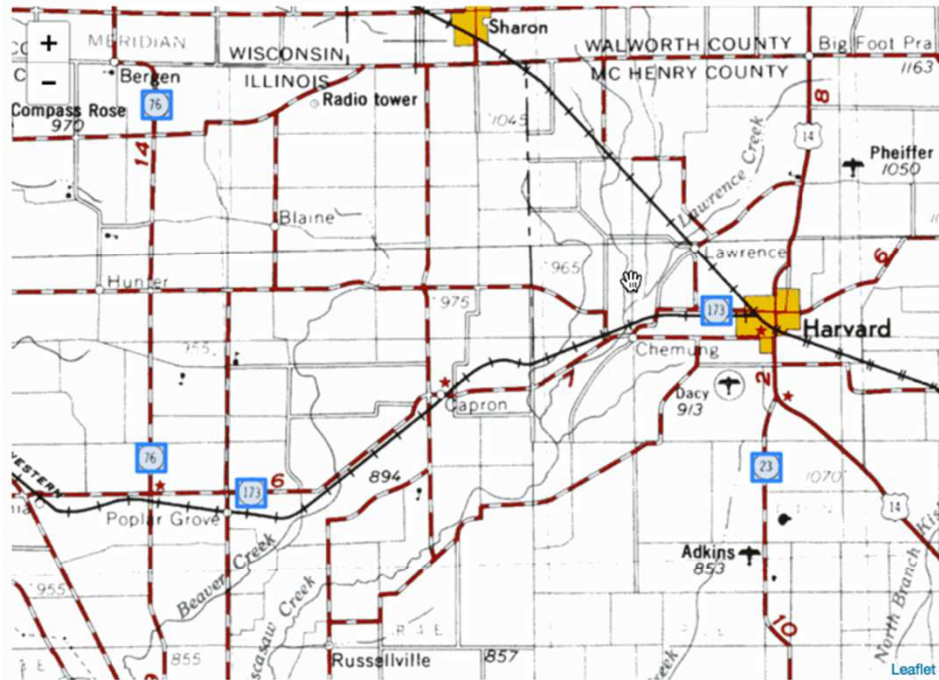
Select a Collection

Default Collection ↕

Next Step

<https://github.com/sul-cidr/histonets>

Review Template Match Results



Next Step

[Create Image Templates](#)



Change Layout

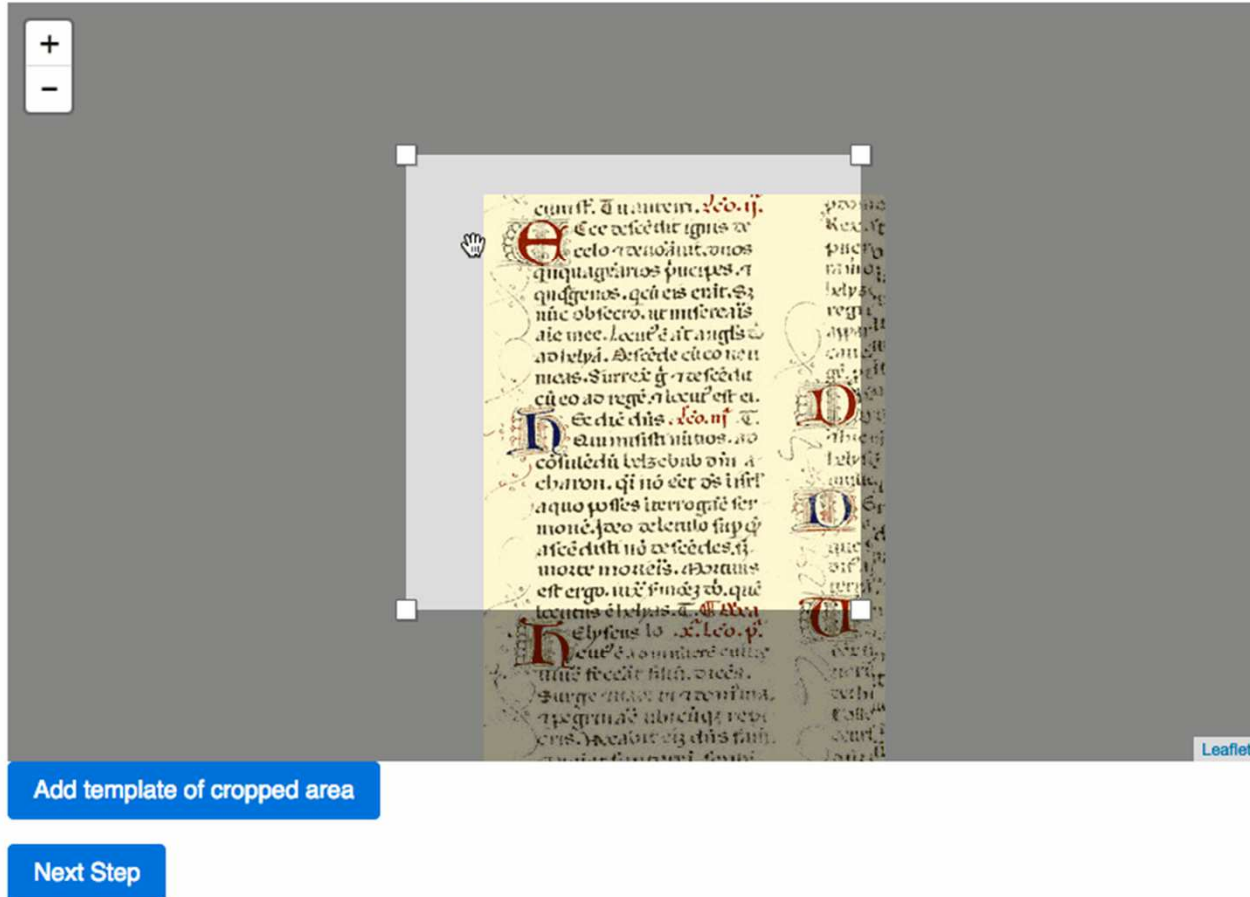
Full Screen



Drop to Load Manifest

Create Image Templates

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



The screenshot shows a digital image editor interface. At the top left, there are two buttons: a plus sign (+) and a minus sign (-). The main area displays a manuscript page with a yellow background and black text in a Gothic script. A grey rectangular crop selection is overlaid on the page, with a hand cursor icon on its left edge. Below the image, there is a blue button labeled "Add template of cropped area". In the bottom right corner of the image area, there is a small blue label that says "Leaflet".

+

-

Hand cursor icon

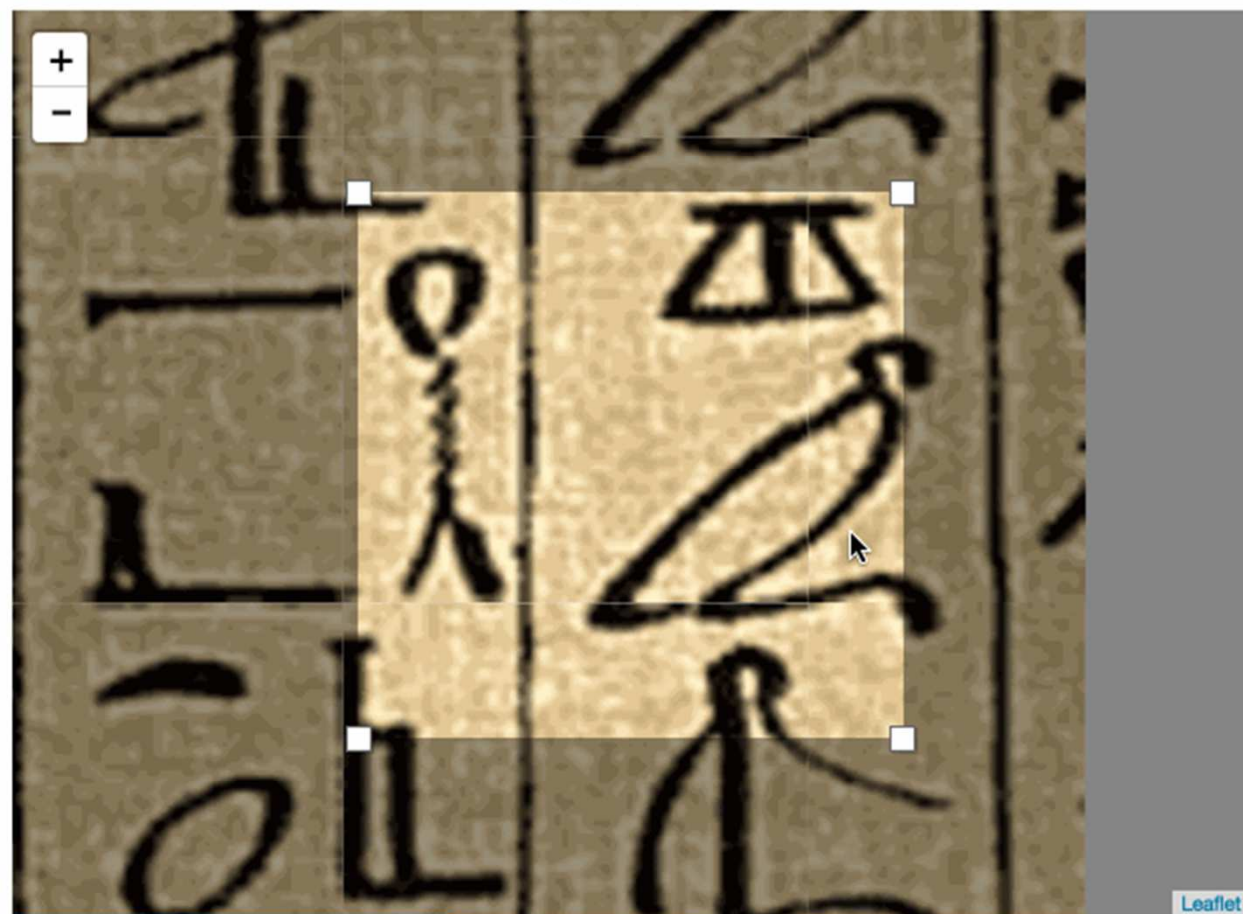
Leaflet

Add template of cropped area

Next Step

Create Image Templates

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

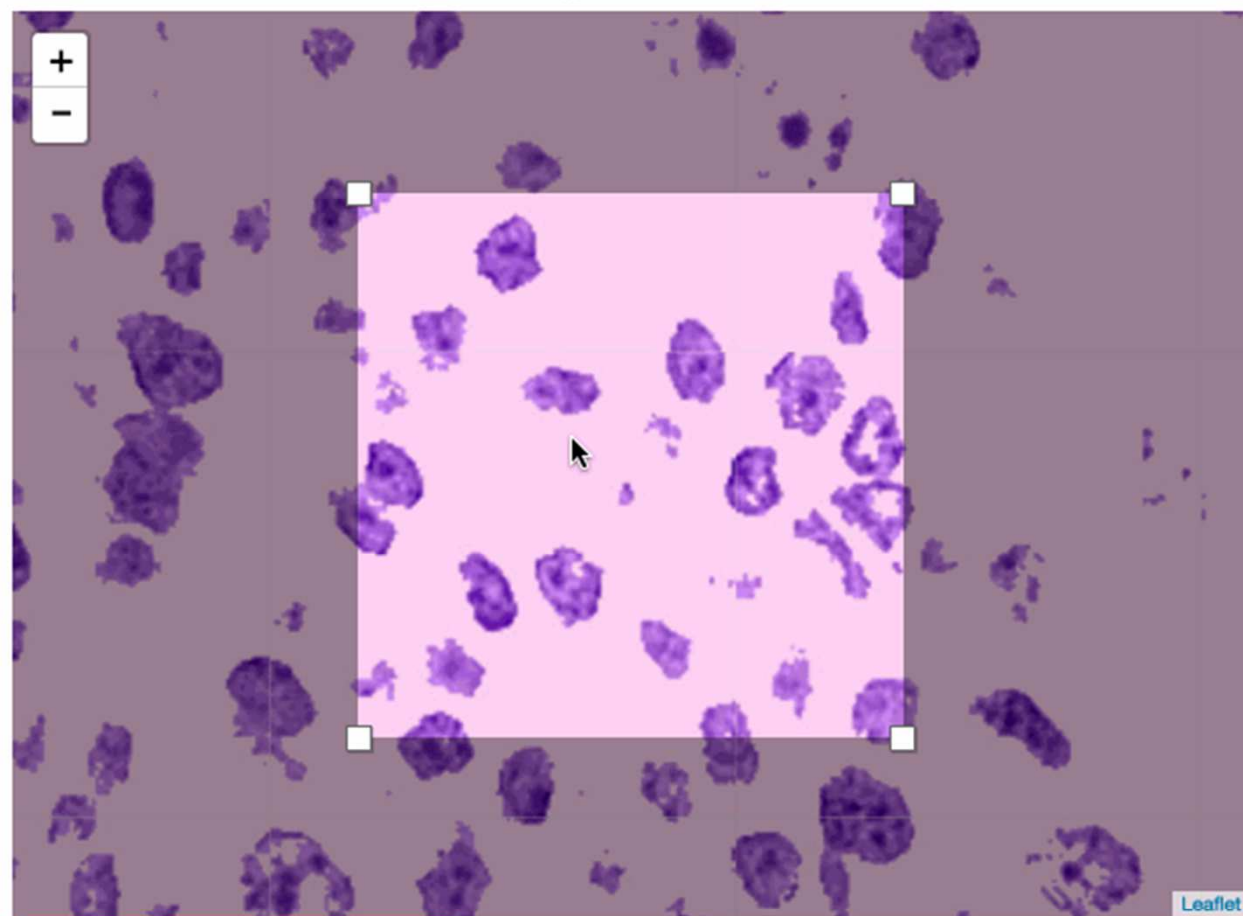


Add template of cropped area

Next Step

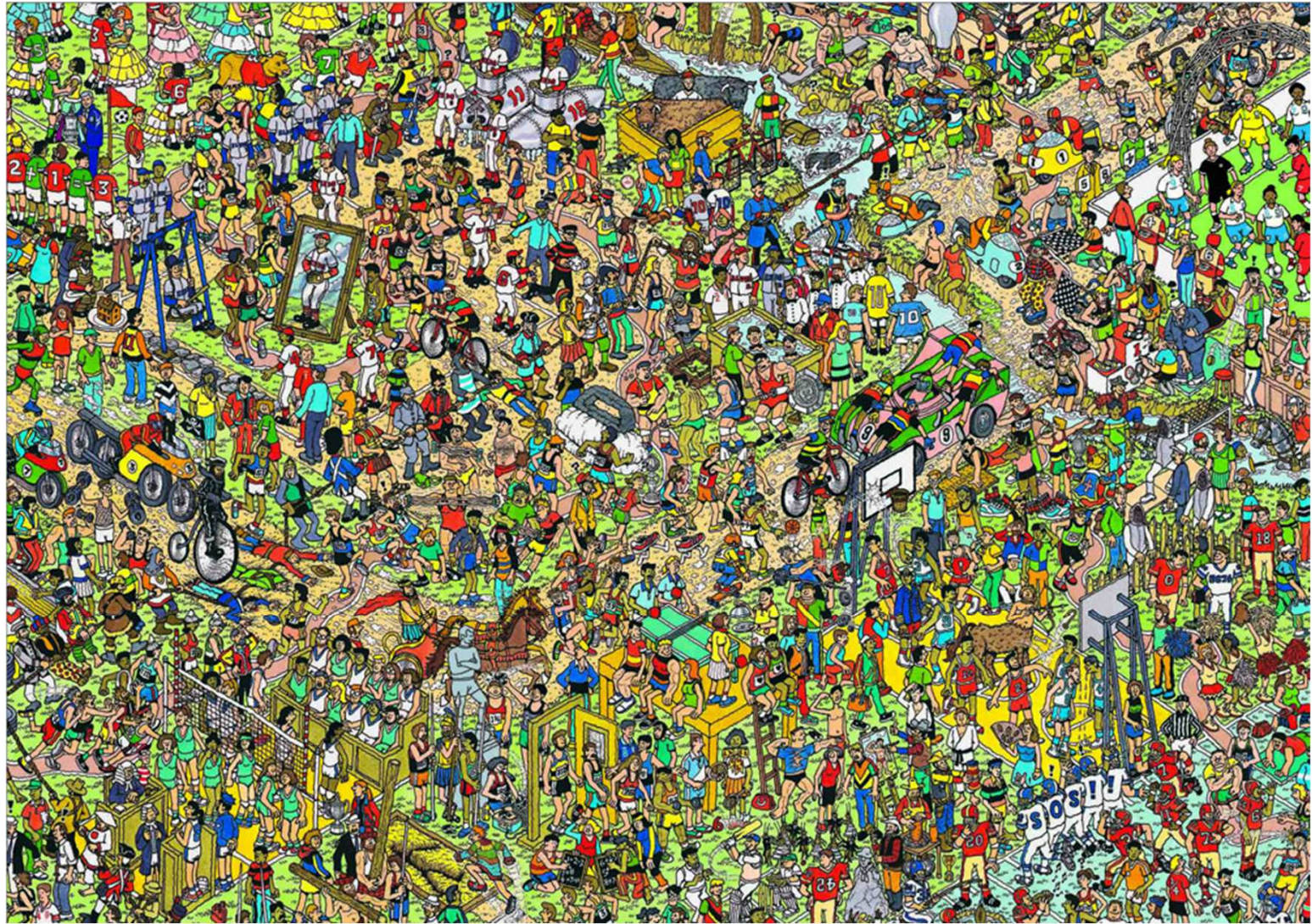
Create Image Templates

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]]]
```



Search

Provider

- Clarifai 3154
- Microsoft 3154
- Google 3152

Labels

- Painting 4702
- Art 3024
- People 2611
- Adult 2263
- Portrait 1900
- One 1866
- Man 1691
- Woman 1625
- Wear 1538
- Illustration 1496
- Religion 1424
- No Person 1213
- Person 1151
- Print 1109
- Veil 905
- Renaissance 870
- Group 853
- Picture Frame 808
- Old 749
- Tree 706
- Saint 645
- Indoor 644
- Two 615
- Water 591
- Landscape 511
- Image 504
- Outdoor 491
- Furniture 488
- Mammal 483
- Nature 481
- Antique 467
- Outdoors 467
- Indoors 465
- Travel 454
- Vintage 436
- Baby 427
- Leader 424
- Text 421
- Child 417

[About this project](#)

9460 results found

Relevance ▾

Clear all filters



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



Hundreds of adopters
Scores of applications
Millions of digital objects
Revolutionary promise

How to Participate

1. Expose your collections via IIF
 1. Introduce the Image API
 2. Transform existing metadata to Presentation API
2. Use IIF-compatible software
(Mirador, UV, Leaflet, AI, etc.)
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 – 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

IIIF Community Newsletter

<https://iiif.io/news-and-events/>

International Image Interoperability Framework Home Demos News & Events Get Involved Get Started

News & Events

Stay up to date on events, upcoming community calls, and news.

Featured events

DEC 05	IIIF Online Meeting 2023 📍 Online 📅 Tuesday, December 5, 2023 More info Register
DEC 11	IIIF Online Training December 2023 📍 Online 📅 Monday, December 11, 2023 More info & registration

IIIF Consortium

- <https://iiif.io/community/consortium/members/>
- 67 institutional members
- Sustainability and steering for IIIF
- Leading a revolution in digital access

Please consider joining!

IIF-C Founding Members

- Artstor
- Bavarian State Library (BSB)
- British Library
- Brown University
- Cambridge
- Chinese U. of Hong Kong
- Cornell
- Data Futures
- Ecole Polytechnique Federale de Lausanne (EPFL)
- Europeana
- Folger Library
- J. Paul Getty Trust
- Johns Hopkins
- Harvard University
- Hong Kong University
- Indiana University
- Kyoto University Library Network
- MIT
- National Gallery of Art (US)
- National Library of France
- National Library of Israel
- National Library of Norway
- National Library of Poland
- National Library of Scotland
- New York University
- North Carolina State University
- Ohio State University
- Oxford
- Penn State University
- Princeton
- Saint Louis University
- Smithsonian Institution
- Stanford
- University of Basel
- University of Edinburgh
- University of Göttingen
- University of Leiden
- University of Michigan
- University of Notre Dame
- University of Pennsylvania
- University of Tokyo
- University of Toronto
- Vatican Library
- Wellcome Library
- Yale University
(incl. Yale Center for British Art)

IIIF dramatically reduces the friction of delivering image-based resources on the Web

- Bigger, better, faster, deeper, cheaper, more modular and more flexible
- Plug-and-play server and client software
- Publish once, reuse often
- Support for attribution and access control

IIF creates radical new capabilities to do more than **view** resources

- Zoom, pan, interact, manipulate
- Compare, reunite, remix & mash up
- Cite and share
- Annotate
- Apply machine learning and AI

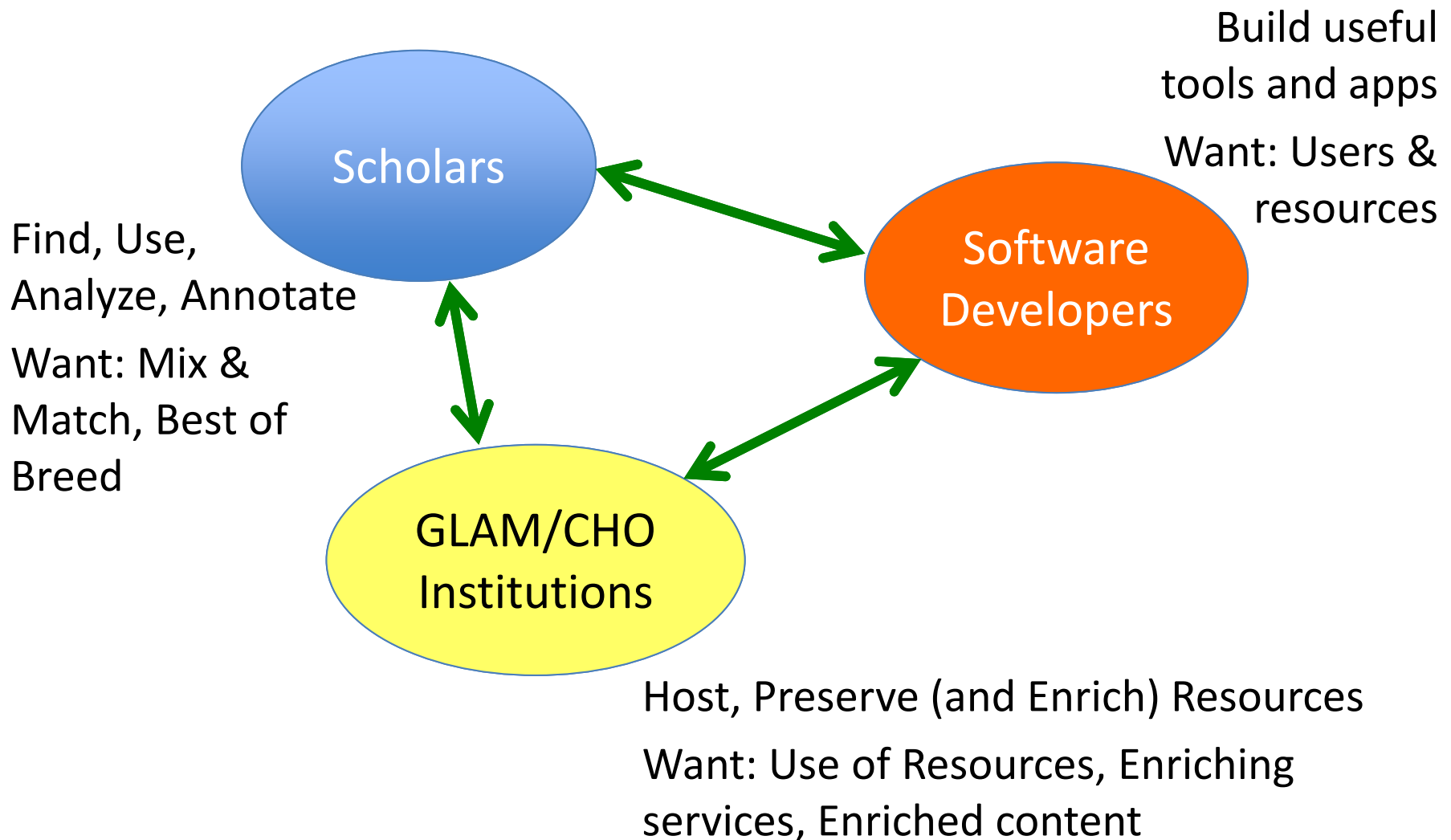
Why embrace IIF?

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



What does it all mean with regard to research and cultural heritage?

Distinct Concerns

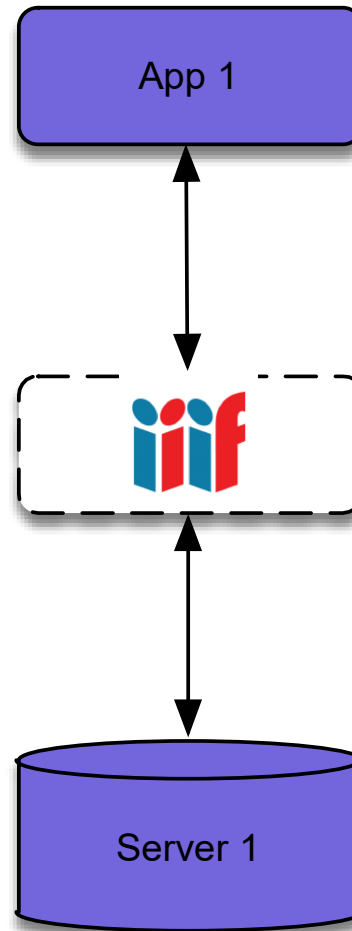


Interoperability

- Technology
- Context
- Space
- Time
- Users

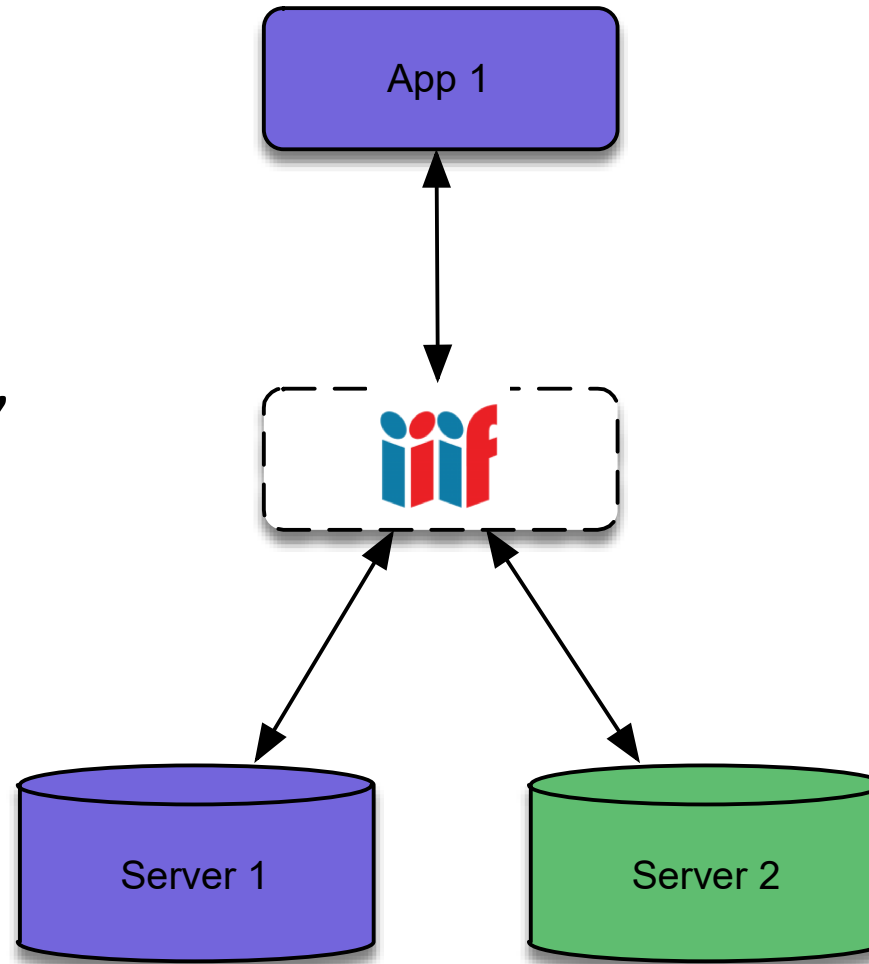
Many-to-many interactions = an ecosystem

Single Server,
Single App

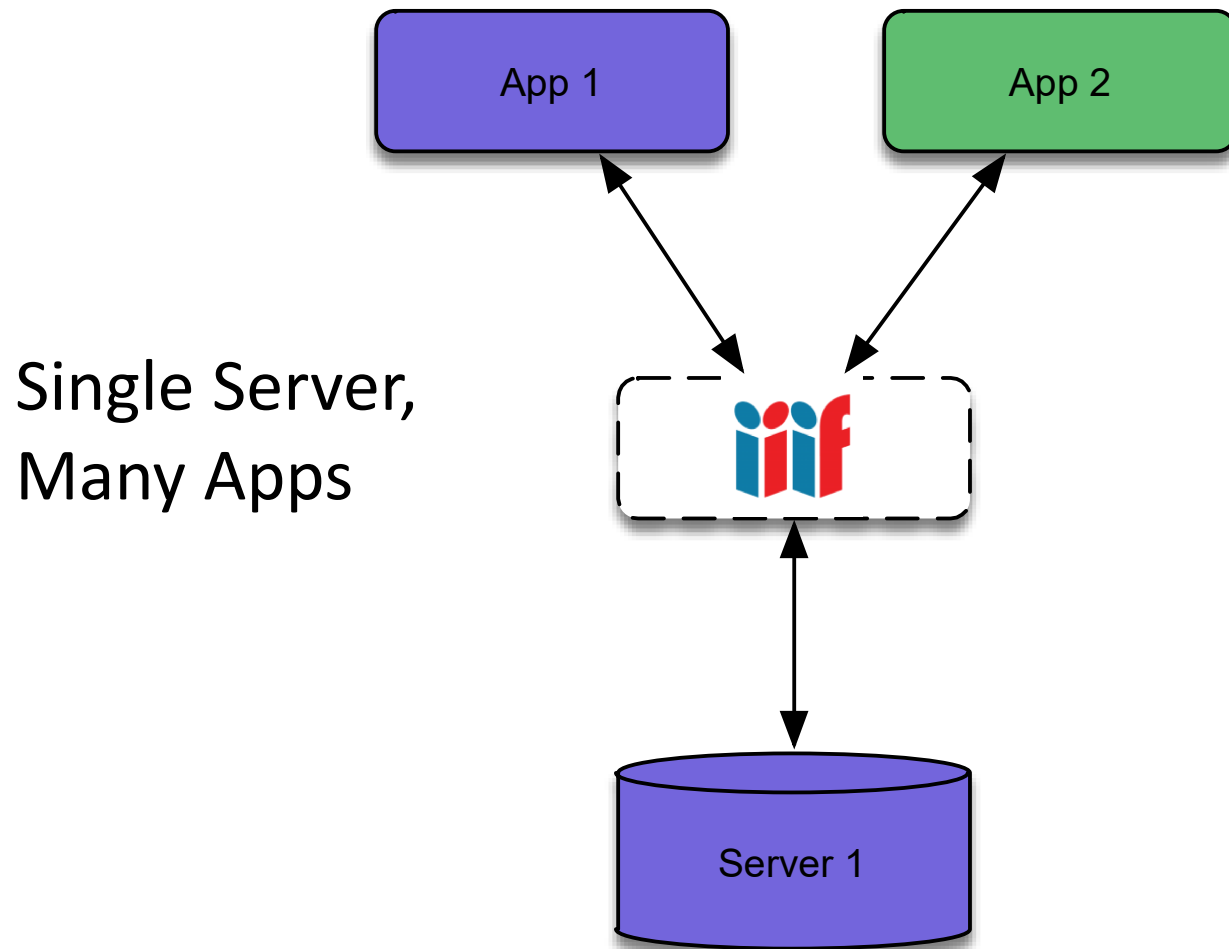


Many-to-many interactions = an ecosystem

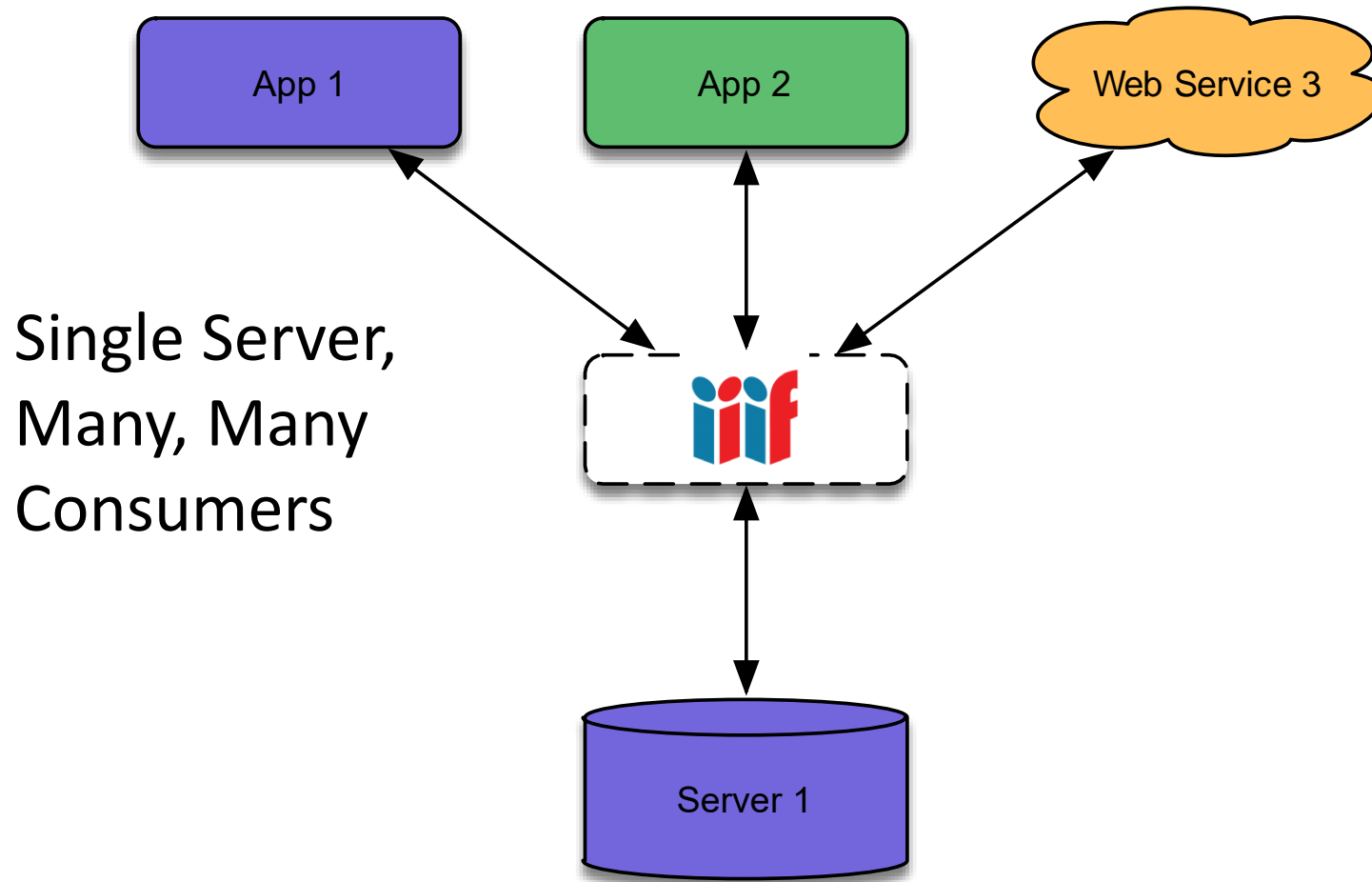
Two Servers,
Single App



Many-to-many interactions = an ecosystem



Many-to-many interactions = an ecosystem



IIIF is (GLAM) community-powered

- By GLAMs for GLAMs
- Distributed network
- Sustainable & scalable
- Building our own capacity, for our communities & mission

Why IIF

“It’s like going from the 18th century to the 21st century in a single click.”

– Franziska Frey, Harvard

“IIF is good for us. IIF is good for sharing.”

– Glen Robson, National Library of Wales

Why IIF

“IIF doesn’t just keep you out of silos; it keeps you out of dead ends.”

– Richard Higgins, Durham University

“IIF cuts the amount of time to share content from 7 months to 7 minutes.”

– Rafael Schwemmer, Text & Bytes

How to Participate

1. Use IIF-compatible software and content
2. Expose your collections via IIF
3. Make your software IIF-compatible
4. Ask your software suppliers to become IIF-compatible
5. Attend calls, join the lists or Slack, come to meetings
6. Sign up for IIF-C



International
Image
Interoperability
Framework

iiif.io