

Chances and Limits of the International Image Interoperability Framework (IIIF) with regard to Digital Representations of Visual Artwork

Symposium “New Paradigms for Accessing and
Curating Audiovisual Collections, 28-29. September
2023, “A Blurry Boundary: From Archive to Data II”
Dr. Vera Chiquet

DH LAB

Interdisciplinary Lab of the University of Basel

Roots in 1924 “Abteilung für wissenschaftliche Fotografie”

Teaching, Research and Services in Digitization in Arts and Humanities

Focus on:

Digital research environment, Long-term Archiving

Computational photography

Digital curation

Critical digital studies

Empirical Literary Studies (SNSF excellentia professorship)

Dr. Vera Chiquet


Substitute Head of the Digital Humanities Professorship at the University of Basel.

PhD in art history and sociology, founder of Virtual Culture GmbH (www.virtualculture.ch), initiation of the DHCH network (www.dh-ch.ch)

Research focus:

new methodologies in the humanities, computational and experimental methods for the study of visual and social practices as well as the critical reflection of digital transitions.

Quick Overview of IIIF

 International Image Interoperability Framework

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Gain richer access to the world's image and audio/visual files

IIIF is a set of open standards for delivering high-quality, attributed digital objects online at scale. It's also an international community developing and implementing the IIIF APIs. IIIF is backed by a consortium of leading cultural institutions.

[Get started](#)

Break down silos with open APIs

Many of the images and audio/visual resources that are fundamental to research exist in silos, with access restricted to locally-built applications. IIIF gives you and your audience freedom to work across barriers.

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Downloads

Full screen

Zebrafish embryo

Cavanagh, Annie.


Date 2012

Catalogue details

Licence and credit

Licence: Attribution-NonCommercial 4.0 International (CC BY-NC 4.0)

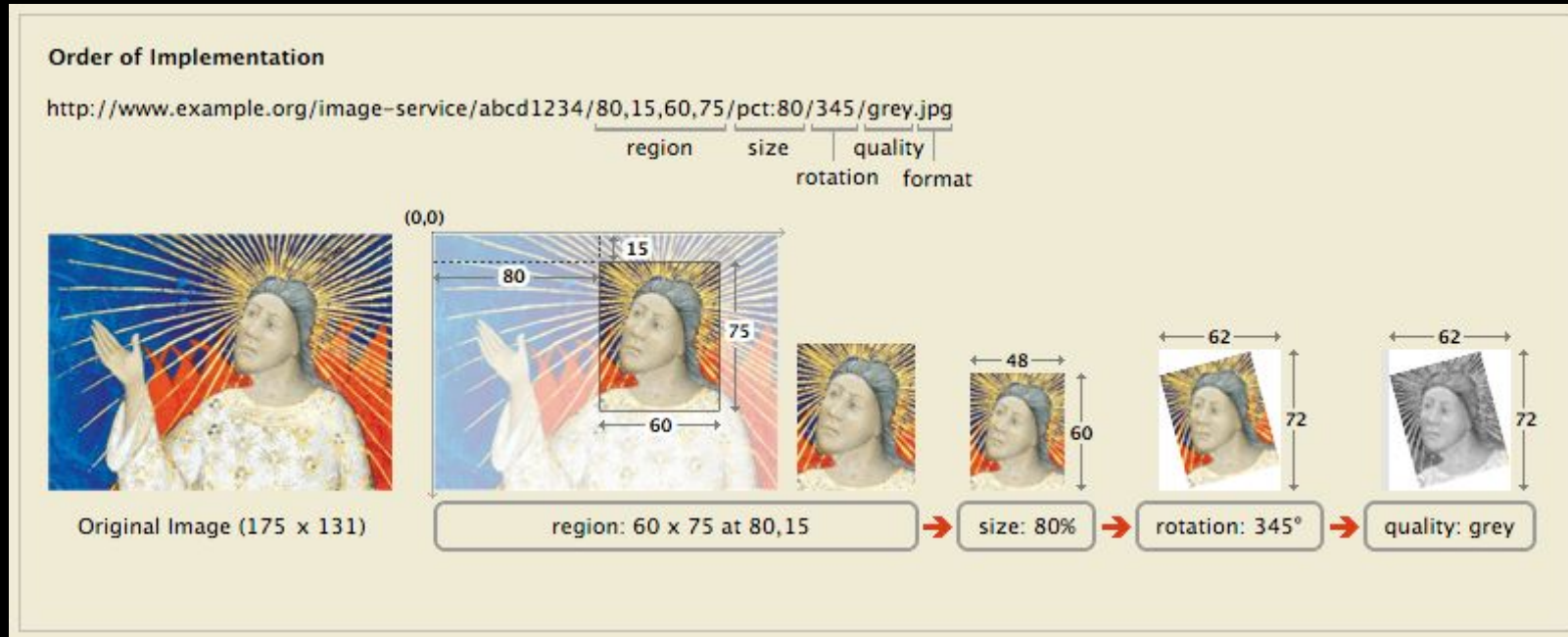
Credit: Zebrafish embryo. Wellcome Collection.



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The Chances Offered by IIIF

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



In this example, 45 degrees rotated and in 50% size and decimated to only grayscale,
<http://www.example.org/image-service/abcd1234/full/pct:50/45/gray.jpg>

Rich image delivery

Fast, rich zoom & pan delivery of images via the Internet, with options for size, scale, region of interest, rotation, quality and format.

Plug and play software

Use any IIIF-compatible software for viewing, comparing and manipulating images from any IIIF-compatible image site, regardless of the back-end server. Swap parts of the stack at any time, or run multiple components in parallel at once.

Publish once, reuse often

Deliver images from your own site for many uses; host a single copy and embed in other sites. No need to transfer images to others for them to locally load and use them for one off analysis or republishing.

Remix content

Assemble and reuse IIIF resources from across the Web, regardless of source. Compare pages, import into tools, build exhibits, or view items served from different sites in one place.

Annotate

IIIF has native compatibility with the [W3C Web Annotation model](#), which supports annotating content on the Web. Comment on, transcribe, and mark up resources using the Web's inherent architecture—even for Audiovisual resources.

Cite and share

IIIF APIs give portable views onto images or any of its regions, and provide incentive for URIs that persist through image server migrations. Cite an image with a stable URI, or share it for reference by others—or yourself in a different environment.

Support for attribution and access control

Built in API calls support attribution and access control: the Authentication API (<http://iiif.io/api/auth/>), is integral and consistent with the IIIF conception.

Global network

Join a global network of image suppliers making content available in a common framework. Tap a growing suite of software tools and platforms. Maximize the use of your images on the Web. Unlock new potential with interoperability. Bring together content from multiple sources (organizational and technical)

Brief demo [iiif/mirador](https://iiif.mirador.io)



mirador

Open-source, web based, multi-window image viewing platform
with the ability to zoom, display, compare and annotate
images from around the world.

TRY A LIVE DEMO

Limits and Concerns

Quality of Digital Representations

Dependent on original scans or photographs.

IIIF is a framework, not a guarantee of image quality.

Technical Barriers

Institutions need the technical expertise to set up and maintain IIIF servers.

Some older institutions may struggle with the transition.

Potential for Misrepresentation

Digital enhancements can sometimes alter the perception of an artwork.

The balance between digitization for accessibility and the true representation of art.

Dependence on Community Adoption

The potential of IIIF is vast, but its true power lies in widespread adoption.

Challenges in getting global institutions on board.

Outlook: Alternative to JPEG2000 - Tiled Pyramid TIFF



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Images

Image Formats

In order to maximize the speed and efficiency of the system, the source images must be in a multi-resolution format. This allows for rapid access to individual image tiles at any resolution with minimal server overhead. This is especially important for very high resolution images. The IIPImage server supports both [TIFF](#) and [JPEG2000](#) formats. TIFF is supported by IIPImage via the [libtiff](#) library with files saved in tiled multi-resolution (pyramid) format. JPEG2000 is supported through [OpenJPEG](#) or through the non-open source [Kakadu](#) JPEG2000 codec, which provides better performance.

Images can be in either 8, 16 or 32 bits per channel format and in greyscale, sRGB or CIE L*a*b* colour space.

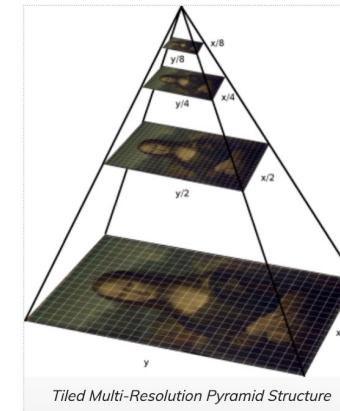
Tiled Multi-Resolution TIFF

The [TIFF image format](#) is an extremely flexible and powerful container allowing almost any possible type of image or even scientific data to be efficiently stored and compressed. Images can be stored in any bit depth: from 1 bit for bi-level images, through standard 8 bit images through to 32 or 64 bit floating point data. Images can consist of 1 or more channels allowing even multispectral and hyperspectral imagery to be stored in a single file. This image data can be stored in uncompressed raw form or compressed losslessly using Deflate or LZW or compressed lossily with JPEG or WebP compression for smaller file sizes.

TIFF also allows image data to be structured in ways that allow for fast random access by means of tiling and through the creation of multi-resolution image pyramids. Tiling allows random regions from an image to be quickly decoded without the need to decode the entire image. Multiple resolutions can also be stored in a pyramid structure to allow fast access to images at any size. The combination of tiling and multi-resolution pyramids provides extremely fast random access to any part of an image at any size, allowing gigapixel or even terapixel large image or data sets to be handled comfortably.

Tiled Multi-Resolution TIFF (or Tiled Pyramid TIFF) are standard TIFF files with each tiled resolution stored as a separate layer within the TIFF. This [example TIFF image](#) can be used to test your IIPImage server.

Tiled multi-resolution TIFFs are widely supported and can be read by most image processing libraries and applications including Photoshop, [GIMP](#), [ImageMagick](#) and many others. A number of applications can also create tiled multi-resolution TIFF. Notably [VIPS](#), [ImageMagick](#), [GDAL](#), [Bio-Formats](#) and [STIFF](#).



Source:

<https://iipimage.sourceforge.io/documentation/images>

Advantages:

Standardized URL structure: Allows users to specify image resolution, region and format directly.

Flexibility: Full implementation of the IIIF specification offers extensive options.

Simplicity: Clearly defined structure for providers and users to systematically reference images.

Disadvantages:

Color management: IIIF currently does not support color management, which can lead to limitations in color reproduction.

Outdated grey values: The integration of older grey values can lead to less accurate rendering.

Technical Barriers: to harness the potential of IIIF, significant technical expertise is necessary.

Conclusion:

While IIIF offers many strengths, especially in the area of flexibility and systematization, there are areas that need further improvement.

Thank you for your attention!