IIIF Curation Platform as a Research Tool of Microcontents in the Humanities

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Personal introduction

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Fields of expertise: Digital Humanities, Cultural Resources Studies

I use The IIIF Curation Platform mainly for converting humanities materials into microcontent (described later).

Recipe content: Focusing on examples of use by humanities researchers

While the director Kitamoto gave an overview of the ICP features, I will present mainly ICP use cases.

- 1. The microcontent named "Collection of Facial Expressions", and art history research using ICP
- 2. Group work and curathon using ICP
- 3. The use environment and environment setting of ICP

Collection of Facial Expressions (KaoKore)



Collection of Facial Expression (KaoKore)

http://codh.rois.ac.jp/face/

- •A collection of facial expressions, appearing in artworks, distributed via IIIF by various institutions.
- Facial expressions are organized and can be searched
- •Facial expressions are collected primarily from Japanese picture scrolls and illustrated books
- Metadata is provided for all facial expressions
- •8,845 facial expressions from 299 works,

(As of February 2021)



KaoKore and the IIIF Curation Platform

Almost all of the functions of the IIIF Curation Platform are used in KaoKore.

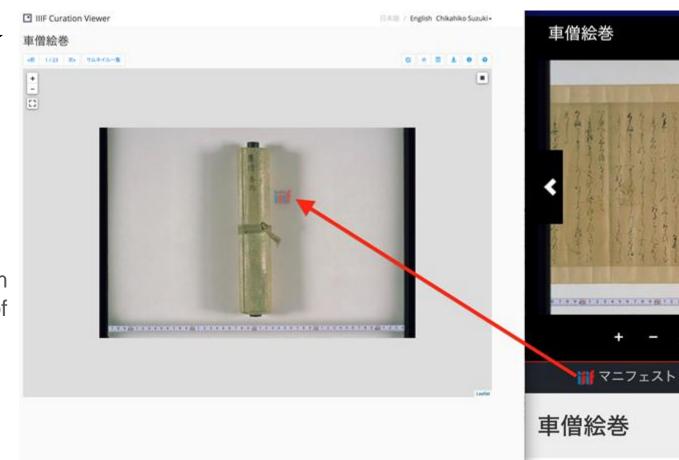
- Cropping of faces with the IIIF Curation Viewer
- Addition of metadata using the IIIF Curation Viewer
 *Batch addition of metadata labes using the IIIF Curation Editor
- Management using the IIIF Curation Manager and editing using the IIIF Curation Editor
- Facet search using the IIIF Curation Finder
- Linkage with machine learning, and dataset construction
- Organization, analysis, and research using the IIIF Curation Board

IIIF Curation Viewer 1. Image display

*

Display in the IIIF Curation Viewer of artwork from which faces are collected

A IIIF manifest is dragged & dropped from the website or archive of each facility. ICViewer enables us to load images simply.



IIIF Curation Viewer 2. Image collection

Using ■ "Crop" button and

☆ "favorite" button to
collect facial expression in
a curation list



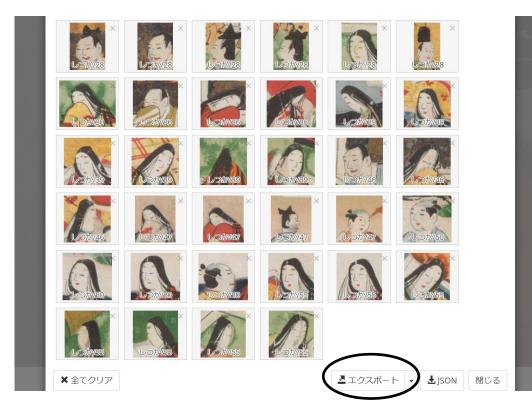


IIIF Curation Viewer

3. Saving a curation ★

Using "Export" button to saves a curation of facial expressions.

*At this stage, curation is saved in JsonKeeper. We can share curation using a URL.

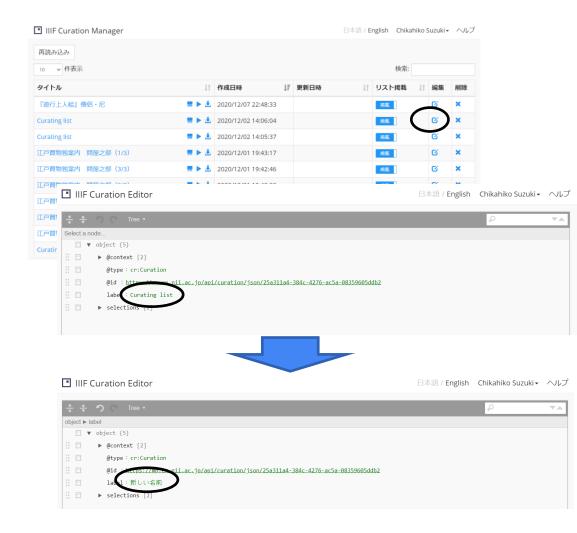


IIIF Curation Editor 4. Management by naming ★

We can rename each curation. With own name, we can eacly manage curations

Using the IIIF Curation Editor, we can rename curations' name isplayed on the IIIF Curation Manager. The character string in "label", directly under "object" section, serves as the title.

*The initial setting name is "Curating list"



IIIF Curation Viewer

5. Adding metadata



Metadata is added with "Edit curation metadata" button

Metadata of the KaoKore: face direction, gender, social class...

... However, creating items oneby-one for each image using "+ item" button is burden for the researchers, so..



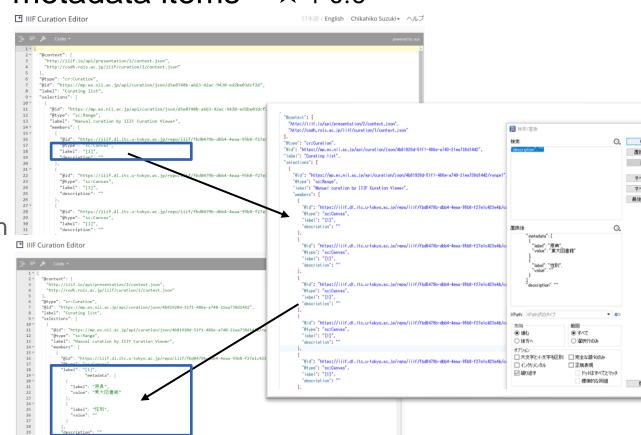
IIIF Curation Editor

6. Batch storage of metadata items ★+0.5

We can use the IIIF
Curation Editor to Batch
setting of metadata items.

*Batch replacement can also be done with Ctrl+F in the ICEditor.

In the example at right, a complex replacement is performed using an external editor (Oxygen)

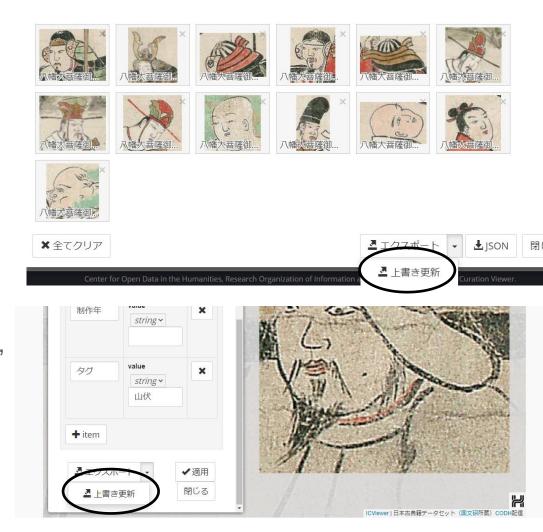


"@id": "https://iiif.dl.itc.u-tokyo.ac.jp/repo/iiif/fbd0479b-dbb4-4eaa-95b8-f27e1c423e4b/canvas/p1#xywh=74740,1332,680,664"

IIIF Curation Viewer7. Suspension of work ★

"Overwrite update" button (export with overwrite) is performed in order to temporarily suspend the curation (both face cropping or metadata stage)

*Caution: When you added metadata, it will not be saved correctly if you didn't export from the metadata input field



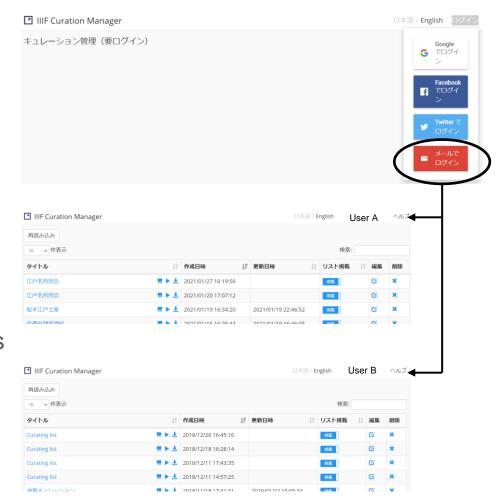
IIIF Curation Manager

8. Management of group work ★

Management of group work with ICP

The KaoKore is constructed by multiple workers.

To support group work, the administrator ascertains the login account of each worker, and manages curation from the ICManager



IIIF Curation Finder / Canvas Indexer

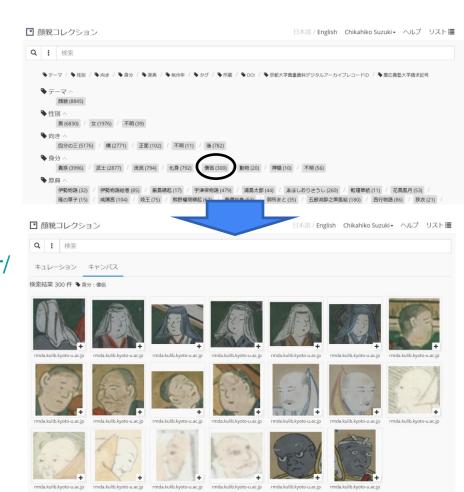
9. Search with metadata



The IIIF Curation Finder enables us to search curation using metadata

Search results can be switched between curation or canvas units http://codh.rois.ac.jp/face/iiif-curation-finder/

The example results of a canvas search using value "Buddhist monk" are shown at right



IIIF Curation Finder

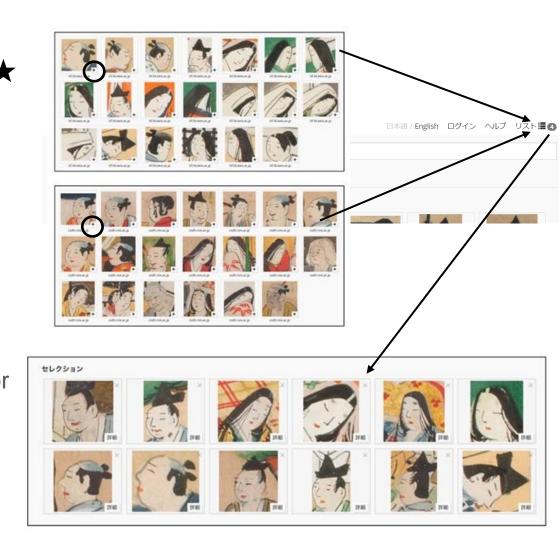
10. Derived curations



A derived curation can be created by selecting the "+" button of IIIF Curation Finder. Selected images can be exported with own URL.

In the KaoKore, this function help us to curation list of faces of interest and similar faces.

*This is also a classical method for styles comparative studies in art history

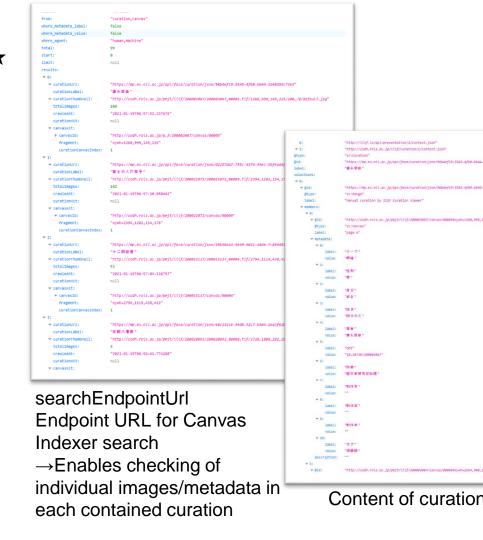


IIIF Curation Finder / Canvas Indexer 11. Batch acquisition of information (1)

Batch checking of information displayed in the IIIF Curation Finder (metadata, image coordinates)

We can use searchEndpointUrl and facetsEndpointUrl

*This is also used for KaoKore dataset construction described later

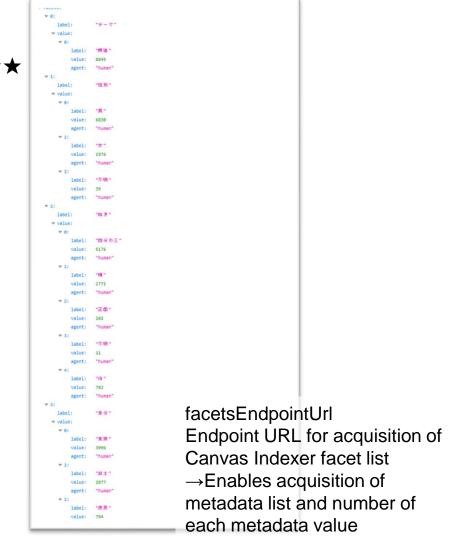


IIIF Curation Finder / Canvas Indexer12 . Batch acquisition of information (2)

Batch checking of information displayed in the IIIF Curation Finder (metadata, image coordinates)

We can use searchEndpointUrl and facetsEndpointUrl

*This is also used for KaoKore dataset construction described later



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13. Use in machine learning

"KaoKore Dataset"

By linking with the IIIF Curation Platform, all facial expression images and metadata from the KaoKore are reconstructed as dataset for machine learning called the "KaoKore Dataset"

http://codh.rois.ac.jp/face/dataset/



Facial expressions in the style of Japanese picture scrolls, automatically generated through machine learning

♣ / 顔貌コレクション(顔コレ) / 顔コレデータセット

顔コレデータセット

顔コレデータセット (KaoKore Dataset) は、日本の絵巻物や絵本に登場する様々な顔貌画像「顔コレ(顔貌コレクション)」を、機械学習に利用しやすい形式で提供するデータセットです。データセットをご利用の際には、引用、ライセンス、利用ガイドラインなどをご確認ください。

データセット

顔コレデータセットは、複数の組織がIIIF (International Image Interoperability Framework)形式で公開する絵巻物・ 絵本に登場する様々な顔貌画像の所在情報とメタデータをまとめたものです。2020年9月現在、最新バージョン(v1.2)のデータセットは、8,848件の顔貌データを提供します。データセットの内容は以下の通りです。

- 1. 顔貌画像 (画素: 256×256) の所在情報 (URL) をまとめたテキストファイル
- 2. 専門家が付与した属性情報 (メタデータ) をまとめたテキストファイル
- 3. 機械学習のためのラベルとデータ分割を指定するCSVファイル

オリジナルの顔コレとの違いは、画像サイズを256x256に統一したこと、および機械学習のためにデータ形式を変換したことです。

以下のGitHubリポジトリ(英語) では、顔コレデータセットに加え、顔貌画像のダウンロードと前処理を行うためのスクリプト もあわせて提供します。

GitHub: rois-codh/kaokore: Dataset for the Collection of Facial Expressions from Japanese Artwork

引用

顔コレデータセットを活用した研究成果を発表する際には、以下の論文の引用をご検討下さい。

Yingtao Tian, Chikahiko Suzuki, Tarin Clanuwat, Mikel Bober-Irizar, Alex Lamb, Asanobu Kitamoto, "KaoKore: A Pre-modern Japanese Art Facial Expression Dataset", arXiv:2002.08595.

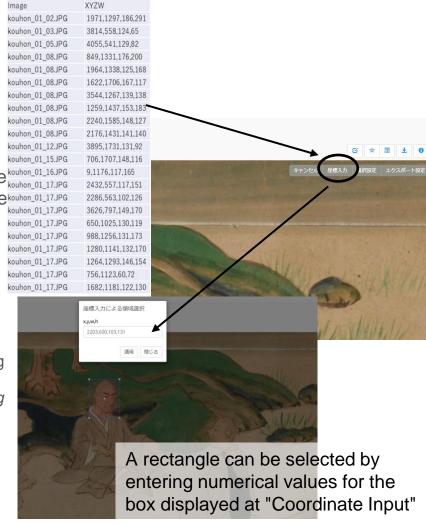
IIIF Curation Viewer 14. Rectangle selection through coordinate input ★

Use of the KaoKore Dataset

- Automatic recognition of facial expressions from picture kouhon_01_17JPG scrolls is performed through machine learning using the kouhon_01_17JPG KaoKore dataset
- Automatic recognition results can be used to support construction of further datasets by using "Coordinate Input" function of the IIIF Curation Viewer

*Reference

Alexis Mermet, Asanobu Kitamoto, Chikahiko Suzuki, Akira Takagishi. "Face Detection on Pre-modern Japanese Artworks using R-CNN and Image Patching for Semi-Automatic Annotation". *Proceedings of the 2nd Workshop on Structuring and Understanding of Multimedia heritage Contents* (SUMAC'20), 2020, p.23–31, doi:10.1145/3423323.3423412



All functions of the IIIF Curation Platform

15. KaoKore and art history research ★★

In joint research with Akira TAKAGISHI (Associate Professor, Department of Art History, University of Tokyo), We use all functions of the IIIF Curation Platform

- Development of a new KaoKore for the Yugyo Shounin Engi-Emaki,
 "Shojo-Kouji Kouhon" 『遊行上人縁起絵巻 清浄光寺甲本』
- Picking out all Buddhist monks and nuns with the same clothing and hairstyles from Kouhon
- we organized those facial expressions using the IIIF Curation Board, and exhaustively checking whether there are differences between monks and nuns
- We can also clarify differences in style of the artists

*Reference

Chikahiko SUZUKI, Akira TAKAGISHI, Jun HOMMA, Alexis Mermet, Asamoto KITANOBU, "Difference between male and female in medieval Japanese picture scrolls -Style comparative study for "Yugyo Shounin Engi-Emaki" using GM Method-" (in Japanese), *Proceedings of Jinmonkon 2020*, pp.67-74, 2020



The IIIF Curation Board enables organizing and attachment of information to curated images

http://codh.rois.ac.jp/software/iiif-curation-board/

There are various functions, so I will present them in stages

Start stage Final stage





16. Reading in images ★

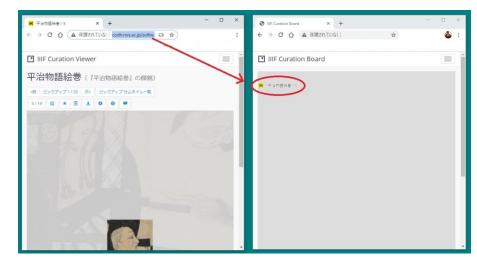
We can load a curation into the IIIF Curation Board

If you login and create a curation, you can easily start from ICManager

You can also start by directly designating a curation URL or simply drag and drop



Start from ICManager



You can also start by directly designating a curation URL, and dragging & dropping it to the ICBoard

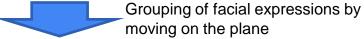
17. Moving and organizing images

Organization on a plane with the ICBoard

Loaded images can be freely moved on the plane by dragging

Images are organized as in the KJ method







IIIF Curation Board 18. Automatic alignment and addition of

ICBoard has Assists grouping

frames

functions

Using automatic alignment and arranging boundary lines, components of image groups are easier to understand



Range selection and automatic alignment



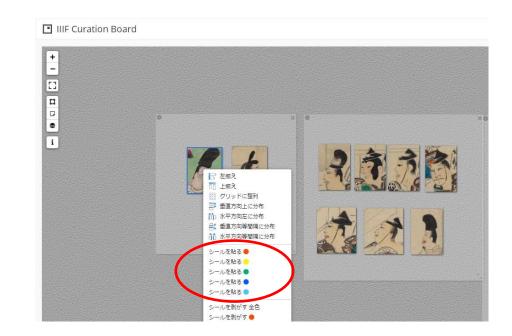
Clarification of groups using boundary lines

19. Sticker function ★

Attribute display using colored stickers

Stickers can be attached to images to clarify group attributes, etc. (5 colors)

*Multiple stickers can be attached to a single image

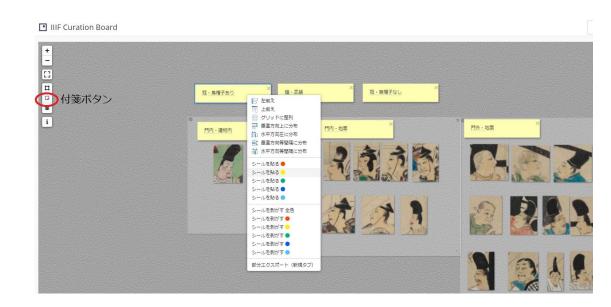


20. Note function ★

Adds text information

Explanations based on textual information can be added by using the note function

Stickers can also be attached to notes, and the intention of color stickers can be clarified



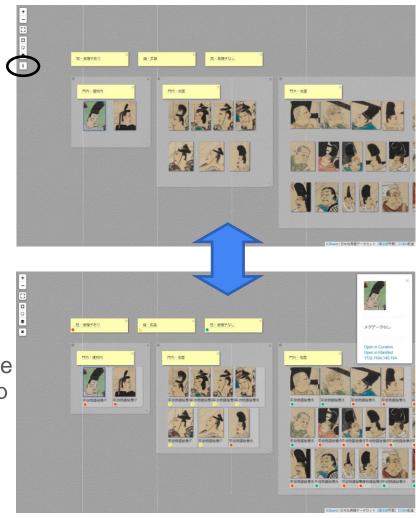
21. Display switching ★

Turns information display on and off

Information display can be switched on and off by pressing the information display (i) button,

- Information based on manifest
- Stickers
- Curation metadata

It is convenient to use this for various purposes. For example, we can organize images with simple display. On the other hand, indicating results step we can show all information.



All functions of the IIIF Curation Platform

22. Converting humanities materials to microcontent



This is an initiative to extract <u>parts of digitized humanities materials</u> and <u>reorganize them at a specific</u> <u>granularity</u> to enable use in research, shown in the practical example of KaoKore.

Workflow using the IIIF Curation Platform

Materials digitized according to IIIF

Extraction and collection of parts from materials

Adding metadata

Cross-search, listing, use in research

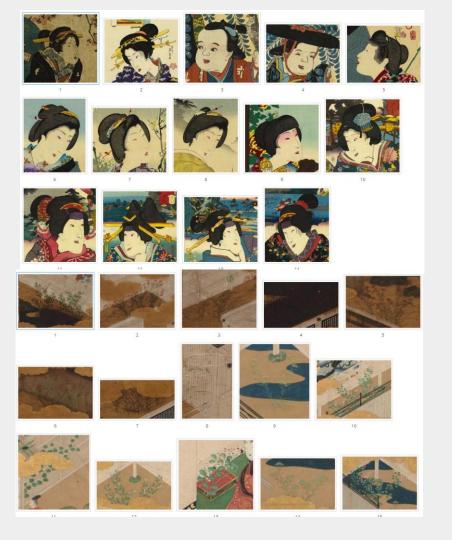
Conversion to microcontents: IIIF Curation Viewer/Manager/Editor

Analyze microcontes: IIIF Curation Finder/Board

There are various other examples beside KaoKore

- "Edo Shopping Guide" http://codh.rois.ac.jp/edo-shops/
- "Edo Tourism Guide" http://codh.rois.ac.jp/edo-spots/

Group Work and Curathon using ICP



Curathon

A curathon, like an ideathon, is an event where people brainstorm ideas on curation for a specific time, present those ideas in front of everyone, and share new discoveries and ideas about curation

We "CODH" have conducted the following two curathon events

- Digital Humanities for Japanese Culture: Resources and Methods
 - http://codh.rois.ac.jp/tutorial/dhsi-2019/
- "Picture Scroll Seminar" Curathon for Faculty of Letters, University of Tokyo
 - http://codh.rois.ac.jp/tutorial/04/

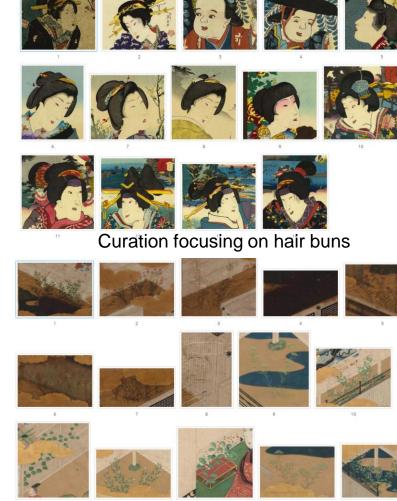
IIIF Curation Viewer / IIIF Curation Manager 23. Conducting a curathon

\star

Curathon process

- 1. Lecture for participants on basic methods of using the IIIF Curation Platform
- 2. Participants freely perform curation
- 3. Participants share and comment on the curations they have made

*If organizer prepared beforehand, curathon go more smoothly. Such as theme is decided beforehand or database, dataset, and search keywords are prepared.



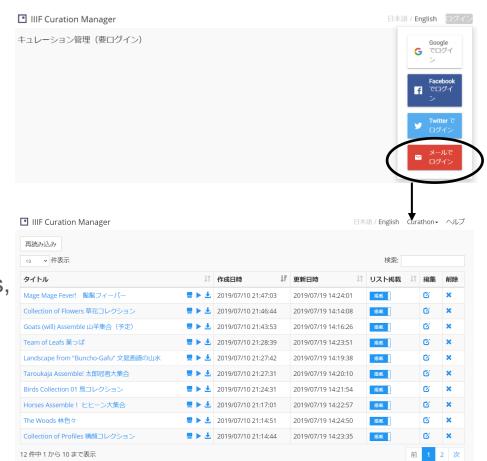
Curation focusing on background plants

IIIF Curation Manager

24. Account sharing

How to manage and share curathon results

It is convenient to use a shared email address and password for login to ICP prepared beforehand by the organizers, especially if you have a lot of participants in the curathion or want to share the results later.



IIIF Curation Editor

25. Filling in "description"

Adding explanatory text to curated images

IIIF Curation Editor

Text can be added to curated images by editing the "description" item in the IIIF Curation Editor

In a curathon, a record can be kept of the intent behind production of a curation, also this function can be used like as explanation of picture in the exhibition

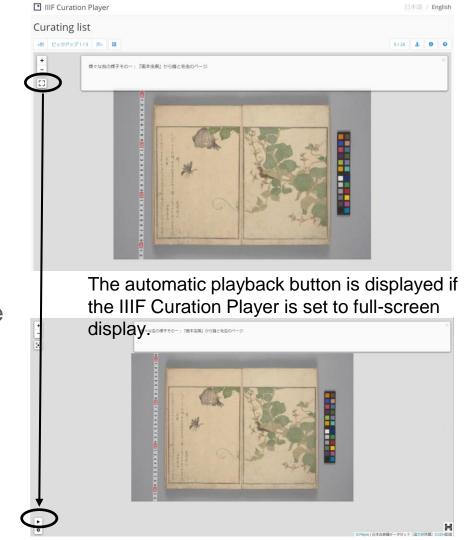
```
"@context": [
        "http://iiif.io/api/presentation/2/context.json",
        "http://codh.rois.ac.jp/iiif/curation/1/context.json"
      "@type": "cr:Curation",
      "@id": "http://www.ch-suzuki.com/curathon/curation/api/863c653c-ef31-4d59-a8ef-32f640ade1e1",
      "label": "Curating list",
9 =
      "selections": [
10 -
11
          "@id": "http://www.ch-suzuki.com/curathon/curation/api/863c653c-ef31-4d59-a8ef-32f640ade1e1/range1",
12
          "@tvpe": "sc:Range".
          "label": "Manual curation by IIIF Curation Viewer".
13
          "members": [
15 *
16
              "@id": "http://codh.rois.ac.jp/pmjt/iiif/200014778/canvas/00004",
17
              "@type": "sc:Canvas",
              "label": "page 5"
              "description": "様々な虫の様子その一: 『画本虫撰』から蜂と毛虫のベージ"
```

日本語 / English Chikahiko Suzuki ▼ ヘルプ

IIIF Curation Player 26. Display of "description" ★

Display of explanatory text attached to a curation

The text in the description can be displayed with IIIF Curation Player.
Aside from presentation through a slide show, this can also be used like exhibition commentary by employing the automatic playback function



Group work using the ICFinder

As one part of art history education, beginning students perform group work as a way of reexperiencing the research process of their predecessors

All faces from the *Ishiyama-dera engi emaki* are prepared and students consider and discuss which of the given faces were used to identify styles in previous research.

Facial expressions are discovered using image search of the IIIF Curation Finder



Masahiko AlZAWA, "Ishiyama-dera engi yokai," *Ishiyama-dera engi emaki shusei*, Chuo-Koron Bijutsu Shuppan (2016)

All functions of the IIIF Curation Platform 27. Art history group work



Preparation for group work using the ICFinder

- This time, we want to use a limited KaoKore (IIIF Curation Finder). So new ICP is prepared in my own server
- 2. I perfume curation of all faces in the subject materials (in this case the 5 scrolls of the *Ishiyama-dera engi emaki*)
- 3. Metadata is added for searching
- 4. Incorporation into ICFinder





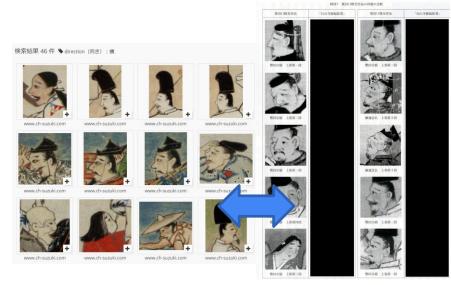
IIIF Curation Finder

28. Art history group work

Conducting group work using the ICFinder

- Participants consider the correct image by using the search function of the ICFinder
- 2. They create derived curations, and make presentations by each group





Participants search using attributes like direction and sex, and choose faces determined to be of a "similar type" by their predecessors

ICP Use Environment

For those who want to use the IIIF Curation Platform

	Use case	Installation method	Project-specific environment
1	When using the demo environment provided by CODH	No installation necessary	Not possible
2	Using the ICP client only	It is enough to download the ZIP file, and expand at the position where a web server is needed	Not appropriate
3	ICP server is needed	Independent installation is also possible, but it is convenient to use the Docker	Possible

I'll explain <u>1 and 3</u>. These are versatile methods.

All functions of the IIIF Curation Platform

29. Use in the demo environment

You can use ICP in the demo environment provided by CODH

A demo environment, except for the IIIF Curation Finder, is available at the CODH website and can be freely used

If you perform authenticated login, you can use curations across various functions http://codh.rois.ac.jp/icp/

IIIF Curation Viewer: http://codh.rois.ac.jp/software/iiif-curation-viewer/demo/

IIIF Curation Manager: http://codh.rois.ac.jp/software/iiif-curation-manager/demo/

IIIF Curation Editor: http://codh.rois.ac.jp/software/iiif-curation-editor/demo/

IIIF Curation Player: http://codh.rois.ac.jp/software/iiif-curation-player/demo/

IIIF Curation Board: http://codh.rois.ac.jp/software/iiif-curation-board/demo/

All functions of the IIIF Curation Platform (Docker version)

30. Use employing Docker ★★

Docker version IIIF Curation Platform http://codh.rois.ac.jp/software/icp-docker/

Easy construction way of your own environment Convenient when you want create search function with the IIIF Curation Finder for your own curations

Requires server management knowledge on the level of understanding port and proxy setting
Also requires basic knowledge of Docker
Nevertheless, beginners who understand the basics can handle it (I (Suzuki) am also at that level)

In conclusion: ICP tutorials

An introduction to basic usage of ICP, including procedures presented in these recipes, are provided this page

https://www.chsuzuki.com/icpt/

ICP tutorial is always being updated, so please be sure to use it



Thank you for listening.

I would like to thank everyone who provided IIIF images and collaborated with this research.