

# DESIGN LANDSCAPE: ONLINE COLLECTION INTERFACES

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## About this report series

This report is part #3 in a series of reports documenting the research process and practice of Lozana Rossenova, a PhD researcher embedded at Rhizome between 2016–2020. The reports trace the development of a practice-based interaction design research project, starting with a Discovery and User Research Phase. This Phase includes the study of the organisational context and history, documented in Report #1; gathering information about past and current use-cases and user expectations, documented in Report #2, as well as a review of the current landscape of digital design for cultural heritage archives and collections, documented in Report #3. The next Phase—Design Exploration, including low-fidelity sketches and prototypes and continuing the conversations with users, is documented in Report #4. This report also includes a summary of the Evaluation design phase, since it is an iterative process throughout the other design phases, rather than one final step. The final outcomes of the Design Specification phase, wherein the initial design proposals are transformed into interactive prototypes and specific recommendations for a data model schema, can be found under the [Prototypes](#) and [Data Models](#) sections of the PhD portfolio website, respectively.

## About the researcher

Lozana Rossenova is a London-based digital designer and researcher, and a PhD candidate at London South Bank University's Centre for the Study of the Network Image. Her PhD is a practice-based collaboration with Rhizome. Lozana is particularly interested in working with open source and community-driven approaches to infrastructure, which organizes, stores and makes cultural heritage data accessible. Her current research focuses on born-digital archives and born-digital art. Her PhD project develops design methods which build understanding across diverse communities of practice and facilitate informed interaction, favouring nuance and complexity over reductive simplification.

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# Executive Summary

## Introduction

This report reviews the landscape of digital collection interfaces utilized for cultural heritage preservation purposes (as of 2018). It asks questions such as: what are the common visual and interaction design paradigms in the field; and how forms of information architecture and choice of databases and content management systems inform user interactions with these interfaces. It does not claim to be a comprehensive state-of-the-art survey.

## Methods

The methods for selecting interfaces to be reviewed included conducting user research (and asking users about collection interfaces they access often), reviewing existing academic literature, and attending relevant talks and demos at professional or academic conferences. The selection is biased towards interfaces accessible in English and institutions based in the Europe (mostly UK) or the US, due to the researcher's own academic position and access to resources.

Selected interfaces are represented via few screenshots (with respective URL addresses and dates of reference). Visuals are supplemented by short analysis and specific elements are called out as design feature cards (designed to be used later in conjunction with the user story cards from Report #2). The focus is not on creating a detailed taxonomy of all design elements of each interface, but rather to capture specific elements, which might be relevant to other collection interface use-cases in general, and the ArtBase specifically.

## Structure of the report

The report is divided across a few specific directions of enquiry – all relevant to the new ArtBase interface. These are articulated in the following sections:

1. **Interfaces for net art archives**
2. **Interfaces for artwork records in institutional collections**
3. **Interfaces for collection entry**

4. Interfaces utilizing collection overview visualizations
5. Interfaces for linked data cultural projects
6. Interfaces utilizing data visualizations to express relationships in collections
7. Interfaces exhibiting net art

The report concludes with a mapping of design feature cards from all seven sections to user story cards from Report #2 and offers recommendations how these could be implemented in the new ArtBase re-design.

## Key findings and recommendations

The report highlights 46 different interfaces ranging from institutional to experimental projects. The design feature cards extracted from these have been assorted into categories relating to: the general structure of the data in the archive; discovery and entry into the collections; the single-record-level page and its metadata; and finally, to exhibiting net art online. The report recommends several of those feature cards to be implemented in the new design prototypes for the ArtBase, not just because they map to specific user stories, but because they can facilitate many of the requirements identified throughout the Discovery and User Research Phase. A selection of these recommendations includes:

- ▶ **A linked data database** – for the capacity to facilitate both complex relationships between items in the database (and across databases), as well as complex search queries within the database.
- ▶ **Explorable terminology** – for the provision of richer metadata around conservation procedures or technical dependencies.
- ▶ **Capacity for contradiction** – for the possibility to add new metadata to the database, alongside existing metadata statements, and to use data provenance information to differentiate, but not erase potential contradictions.
- ▶ **Expression of relations** – for the possibility to make explicit links across various items in the linked data database, such as common exhibition histories or common technical dependencies.
- ▶ **Links to pre-set queries** – for the capacity to act as navigational tools and to support understanding of context and relationality in the archive.
- ▶ **SPARQL query GUI** – for the facilitation of complex research needs.
- ▶ **Single-object timeline** – for the provision of temporal context, versioning and preservation history metadata for digital cultural heritage

- ▶ **Metadata related to literature and events** – for the provision of additional temporal and historical context around artworks, such as exhibitions and reviews.
- ▶ **Metadata clustering** – for the facilitation of granular access to data.
- ▶ **Access statement** – for the capacity to set user expectations around access provision to different variants of net art works.
- ▶ **Emulated environments** – for the provision of access to functional artworks in a historicized context.
- ▶ **Overlay state for contextual information** – for the provision of additional context alongside artwork re-performances, within a granular approach to data presentation.
- ▶ **Including the browser frame (in thumbnail or static screenshot representations)** – for the provision of a specific temporal context around net art works, which is often integral to the user experience of the works.



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# Introduction

## Problem statement

Research around interface design for online collections and digital cultural heritage preservation is already being carried out, even if remaining somewhat fragmented (see Bibliography). The surveys which aim to be comprehensive, by necessity tend to be focused on a specific direction of enquiry – e.g. the use of data visualisation; design for serendipitous discoveries and browsing; design for advanced search utilities. While all of these topics are interesting in their own right, looked at in isolation, they do not provide the necessary points for benchmark evaluation needed for the re-design process of the ArtBase.

This report reviews the landscape of digital collection interfaces (as of 2018) and asks questions such as: what are the common visual and interaction design paradigms in the field; and how forms of information architecture and choice of databases and content management systems inform user interactions with these interfaces. Of particular interest are areas in the design of interfaces focusing on the presentation of complex born-digital artefacts; metadata around temporal and historical context; as well as discovery and search within the framework of a linked data database.

## Methods for selection and analysis

The methods for selecting interfaces to be reviewed included conducting user research (and asking users about collection interfaces they access often), reviewing existing academic literature, and attending relevant talks and demos at professional or academic conferences. The decisions how to group and discuss interfaces in sections are connected to the existing context of the ArtBase archive (an archive of net art; a Wikibase instance; a linked data database), balanced against the primary focus of the research project which is the presentation of the individual artwork record and related records, and the potential need for future research into collection-level visualizations and query-capabilities.

Selected interfaces are represented via few screenshots (with respective URL addresses and dates of reference). Visuals are supplemented by short analysis and specific elements are called out as design feature cards (designed to be used later in conjunction with the user story cards from Report #2). The focus is not on a creating a detailed taxonomy of all design elements of each interface,



but rather to capture specific elements, which might be relevant to other collection interface use-cases in general, and the ArtBase specifically.

## Structure of the report

The report presents a ‘scan’ of the landscape divided across a few specific directions of enquiry – all relevant to the new ArtBase interface. These are articulated in the following sections:

1. **Interfaces for net art archives** – providing the opportunity to evaluate what are the other net art archives online and how they present artworks and metadata.
2. **Interfaces for artwork records in institutional collections** – this expands on section 1. by broadening the scope beyond net-art-only collections to include collections in larger institutions which may have some net art or software-based art pieces. Added are also some institutional interfaces which utilize relevant design patterns, even if not dealing specifically with born-digital art.
3. **Interfaces for collection entry points** – this section expands on the previous one by looking at how collections and archives can be accessed: taking a step back from the individual record page.
4. **Interfaces utilizing collection overview visualizations** – this section builds upon the previous by focusing on the use of various data visualization approaches towards providing “alternative” collection or archive entry points.
5. **Interfaces for linked data cultural projects** – having looked at how item records are represented in general institutional interfaces, as well as what are the entry points to these interfaces (including those that utilize data visualizations), this section focuses on projects which use applications specifically built around a linked data database. This section, therefore, aims to provide guidance as to how applications such as Wikibase (the linked data system underlying the ArtBase archive) might be utilized for cultural heritage purposes.
6. **Interfaces utilizing data visualisations to express relationships in collections** – this section focuses on a specific strand of collection data visualization: namely, how data visualization techniques, in combination with a linked data database, can provide ways of expressing complex relationships between various items (or concepts) in the archive or collection.
7. **Interfaces exhibiting net art** – this final section looks beyond interfaces built for archives and collections and focuses instead on the exhibition format. How can net art be exhibited online and what paradigms are typically used? The section aims to highlight features which might be of use for the re-performance platforms Rhizome is developing in addition to the main archival interface.

## Limitations of the method

This landscape overview does not claim to be a comprehensive state-of-the-art survey. Such a survey would require a larger research team, and broader time framework. The review here was conducted over several months in 2018. Some of the interfaces (and attendant notes) may be outdated by time of publishing.

To mitigate the effects of link rot, in addition to providing the original source URLs for the interfaces under review, the report is complemented by a web archive collection of all referenced interfaces, which can be accessed at: [https://conifer.rhizome.org/lozana\\_r/collection-design-landscape](https://conifer.rhizome.org/lozana_r/collection-design-landscape)

The net art exhibitions referenced in section 6 of the report are available as separate, complete web archive collections, listed under each exhibition's respective title here: [https://conifer.rhizome.org/lozana\\_r/](https://conifer.rhizome.org/lozana_r/)

A further limitation of the research method is the bias within the selection towards interfaces accessible in English and institutions based in Europe (mostly UK) or the US, due to the researcher's own academic position and limited access to resources. Goals for future extensions of this research include more international collaborations that can extend the cultural reach and relevance of the survey.<sup>1</sup>

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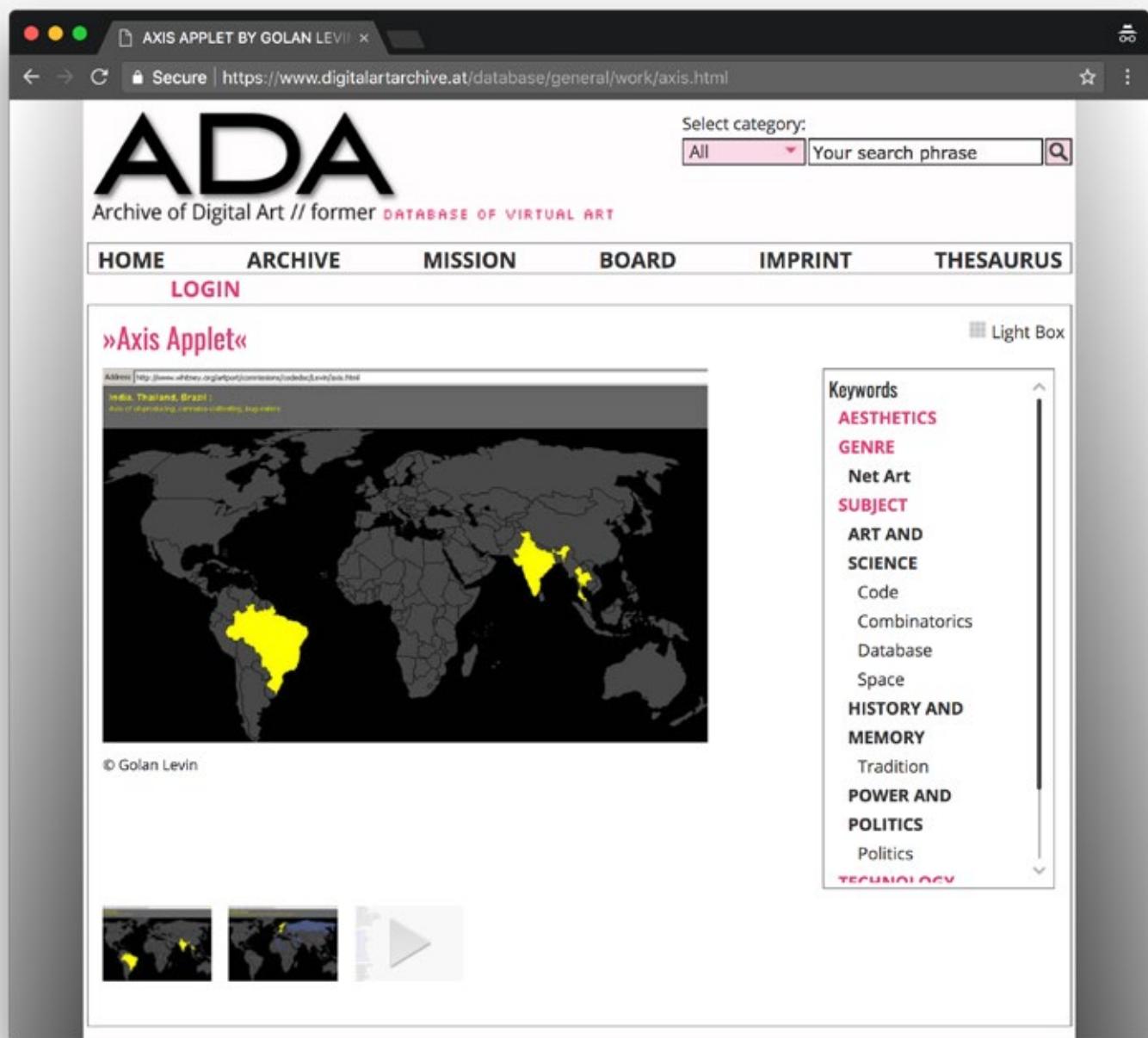
<sup>1</sup> Some discussions for possible expansions of scope have already started.  
See: <https://twitter.com/phivk/status/1256931372486340608?s=20>



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# 1 Interfaces for net art archives

# Archive of Digital Art (still active)



Example view of an artwork record: Screenshot previews and keyword categories are featured near the top of the page.



Metadata clustering



Metadata related to  
literature & events

The screenshot shows a web browser window with the title "AXIS APPLET BY GOLAN LEVIN" and a secure connection to https://www.digitalartarchive.at/database/general/work/axis.html. The page is divided into several sections:

- Information**: Contains a profile picture of Golan Levin and the text "»Axis Applet«, 2002".
- Technology**: Contains the heading "SOFTWARE" and the text "JAVA applet".
- Literature**: Contains a citation by Marchese, Francis T.: "Software Archaeology and the Preservation of Code-based Digital Art." In *Proceedings of Archiving Conference 2013*, edited by Society for Imaging Sciences and Technology, 25-29 Springfield, MA, 2013.
- Descriptions & Essays**: Contains the text "enter project here: artport.whitney.org" and "Scroll down to the bottom of the code to launch its results." It also includes a note about Java Security Settings and mentions that it was commissioned by the Whitney Museum.
- Exhibitions & Events**: Contains the text "2003 Exhibition : »CODEDOC II« Are Electronic Arts".

*Example view of an artwork record: Other metadata available for the record is grouped in categories near the bottom of the page.*

**Reference URL:** <https://www.digitalartarchive.at>

**Date of screenshots:** 2018-05-14

**Notes:** Participants in some of the user studies found parts of the metadata presented here useful; in particular, elements such as essays, literature, or exhibitions and events related to a specific artworks (when such data was available).

## Turbulence (legacy database)

The screenshot shows the Turbulence legacy database interface. At the top, there's a navigation bar with a back/forward button, a 'Not Secure' warning, and a search/filter input field. Below the bar, the word 'turbulence' is displayed next to a menu icon. To the right is a search bar with a magnifying glass icon and the placeholder 'Search or filter'. Further right are date navigation buttons for '2015 / 1996'. Below this, there are three filtering options: 'projects grid', 'projects with titles', and 'people', each with a corresponding icon. The main content area is a grid of project thumbnails, ordered chronologically from 2015 at the top to 1996 at the bottom. Each row contains ten thumbnails, with some rows having fewer than ten due to the grid layout.

*Collection overview: Thumbnails of the projects are ordered chronologically.*



Overviews & previews

**text\_ocean**

A Random Access Reading of Moby Dick

— September 2015 —

by Zannah Marsh

*Supported by Jerome Foundation*

**text\_ocean** is an experiment in random access reading and text visualization, using Herman Melville's notoriously impenetrable whalefishery epic 'Moby Dick' as source material. Selections of the text are blown apart and become a dynamic sea of words, animated according to grammatical function. A new text selection appears each time the browser is refreshed.

*Example view of an artwork record: A prominent access point, title, description and few other metadata entries are featured near the top of the page.*

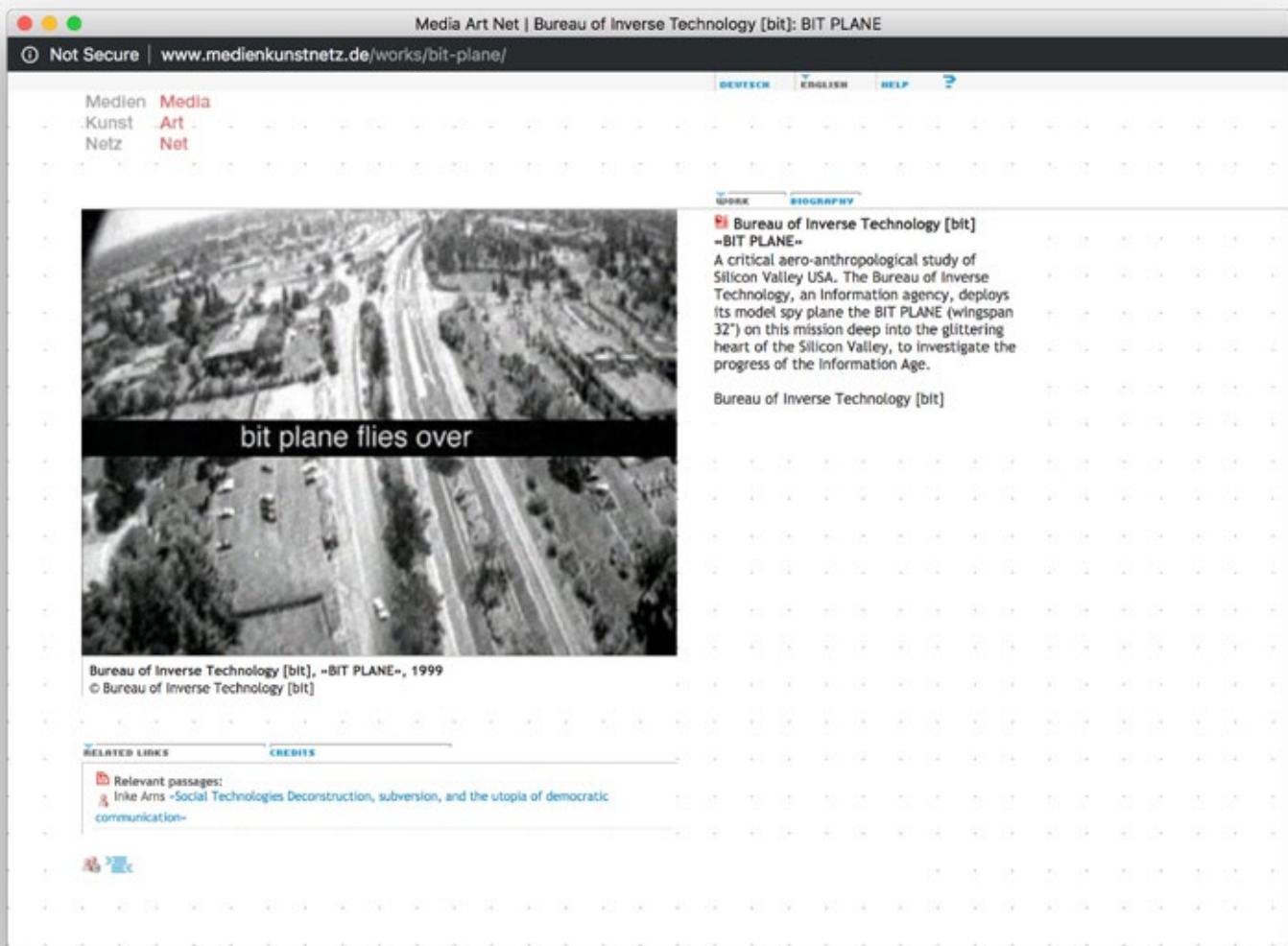
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**Reference URL:** <http://turbulence.org>

**Date of screenshots:** 2018-05-14

**Notes:** Participants in the user studies did not find the collection overview particularly useful, nor the metadata provided with each artwork record.

# Media Kunst Netz (legacy database)



Example view of an artwork record 1: Features include image thumbnail, short description and related citations.



Metadata related to  
literature & events



Metadata clustering

Media Art Net | Jodi: walkmonster\_start ()

① Not Secure | www.mediakunstnetz.de/works/walkmonster-start/

Medien Media  
Kunst Art  
Netz Net

DEUTSCH ENGLISH HELP ?

**BIOGRAPHY**

**Jodi**  
«walkmonster\_start ()»  
On October 22, 2001, Jodi put an extensive text onto the international e-mail list Netttime. The text seemed to be a critical comment on contemporary political crises and wars and the way they were discussed on cultural platforms on the Web. But above all, the text turned out to be an impressive poetic work. The military order of linguistic and typographical features gave the text the appearance of an obsessively encoded inventory or a strategic diagram or plan. Readers who know both English and programming languages were also able to see that the poem is a functional source code in the programming language C. Indeed, the text is one part of a source code of Jodi's untitled game. This code is based on the source code of the commercial computer game Quake. By holding back the information about its origin and function, Jodi's e-mail made visible the esthetical and political subtexts of seemingly neutral sequences of technical commands.

(Source: Florian Cramer, «Discordia Concors: www.jodi.org,- in: [plugin] / Tilman Baumgärtel / BüroFriedrich (eds.), Install.exe-Jodi, Basel, 2002)

**RELATED LINKS** **CREDITS**

- Categories: Internet
- Keywords: Computer graphic | Interface | Material
- Relevant passages:  
Inke Arns -Read\_me, run\_me, execute\_me. Code as Executable Text: Software Art and Its Focus on Program Code as Performative Text-
- Works by Jodi:  
JET SET WILLY ©1984 OSS----

*Example view of an artwork record 2: Features include image thumbnail, short description and 'Related links', such as keywords, citations, as well as other works by the same artist.*

**Reference URL:** <http://www.mediakunstnetz.de>

**Date of screenshots:** 2018-11-15

# runme.org (legacy database)

The screenshot shows the homepage of runme.org. On the left, there is a large grid of keywords arranged in a grid. On the right, there is a login form with fields for email and password, and a 'login' button. Below the login form is a sidebar titled 'newcomers. sign up here.' containing links to various projects and a 'Featured projects' section.

Collection overview by keywords.

The screenshot shows a detailed view of an artwork record. At the top, there is a large thumbnail image of the artwork, followed by its title 'naked on pluto'. Below the title, there is a brief description, the names of the creators, and a note about the project being a playful yet disturbing online game world. There is also a link to the project's homepage and download information. On the right side, there is a login form and a sidebar with project links.

Example view of an artwork record.



Invitation to contribute



Expression of relations

The screenshot shows a web browser window for the runme.org website. The address bar indicates the site is not secure. The main content area displays a hierarchical list of categories under 'say it with software art!'. Categories include: algorithmic appreciation (2), appropriation and plagiarism (5), artificial intelligence (10), artistic tool (38), bots and agents (16), browser art (21), code art (24), conceptual software (31), data transformation (37), digital aesthetics r&d (12), digital folk and artisanship (20), existing software manipulations (8), and games (16). Each category has a sub-menu with further links. To the right of the categories is a sidebar with a login form, a link to 'newcomers, sign up here.', and sections for 'latest projects' and 'featured projects'.

- [front](#) | [latest](#) | [featured](#) | [categories](#) | [keywords](#) | [news archive](#) | [submit a project](#) | [read\\_me festival](#) | [about](#) | [faq](#) | [feedback](#)
- [search](#)

**runme.org - say it with software art!**

[newcomers, sign up here.](#)

**login**

email  
  
password

[login](#)

[forgot your password?](#)

**latest projects**

[naked on pluto](#)  
[torrent.py](#)  
[100.000.000 stolen pixels](#)  
[Excerpts From the Chronicles of Pookie & JR](#)  
[Satromizer.oJ](#)  
[CodeSounding](#)  
[Velato](#)  
[Destroy the Web](#)  
[\[more\]](#)

**featured projects**

[LYCAY \(Let Your Code pLAY\)](#)  
[Reject Me](#)  
[Go-Logo](#)  
[Outsource me!](#)  
[The Invisible Hand Machine](#)  
[aPpRoPiRaTe!](#)  
[Towards a Permanently Temporary Software Art Factory](#)  
[\[more\]](#)

*Collection overview by categories.*

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**Reference URL:** <http://runme.org>

**Date of screenshots:** 2018-11-15

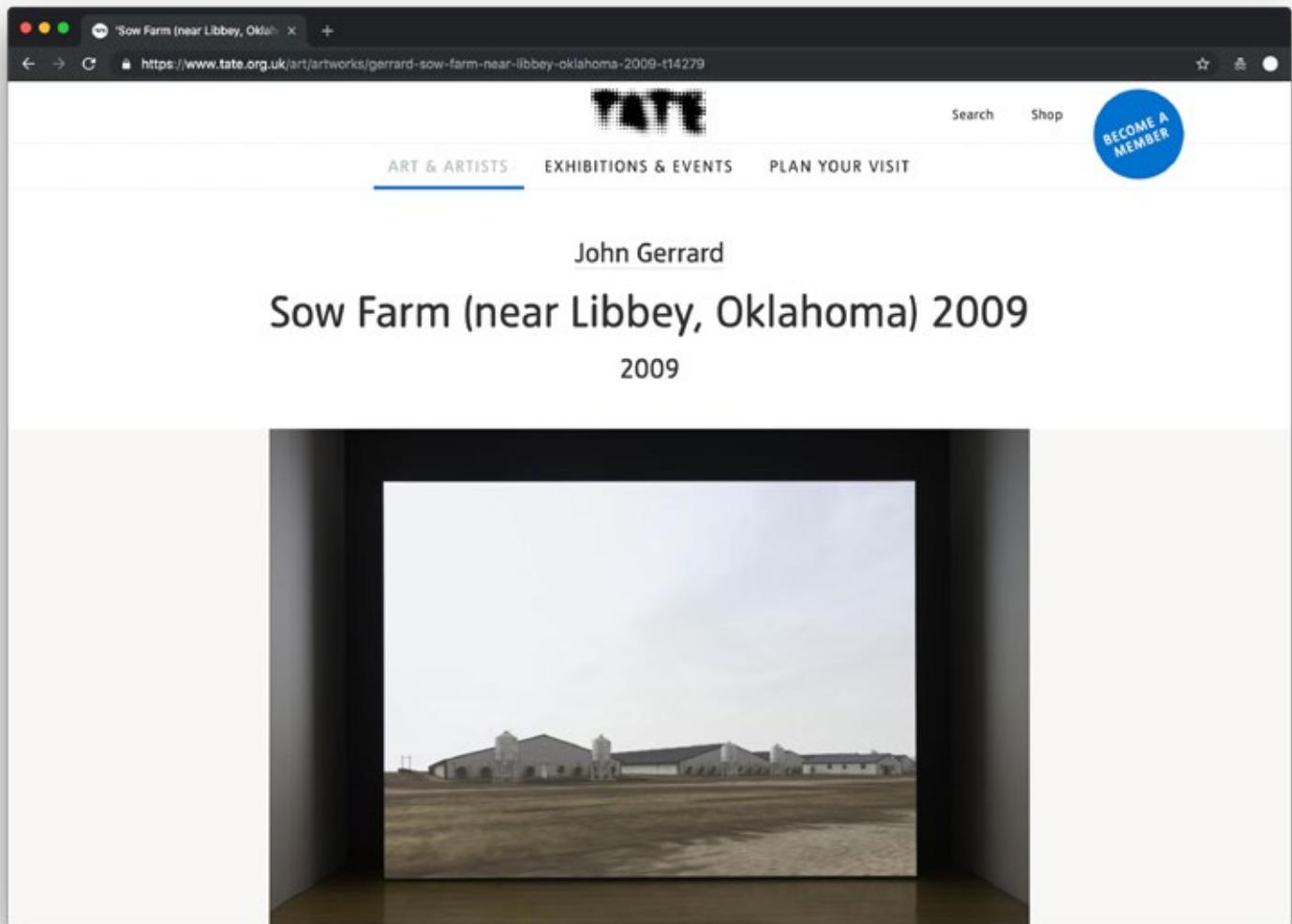
**Notes:** One participant in the user studies commented on this site and the creative use of categories and keywords for organizing. This approach, however, is sustainable when information is consistently provided by artists within a purpose-built framework based around the artist's submissions. While close to the early stages of the ArtBase, the ArtBase later evolved to have different collection policies.



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## 2 Interfaces for artwork records in institutional collections

# Tate (UK)



*Example view of an artwork record: An image slideshow is featured near the top of the page.*



**Access statement**

*Example view of an artwork record: Descriptive text and other metadata available for the record are featured near the bottom of the page.*

**Reference URL:** <https://www.tate.org.uk>

**Date of screenshots:** 2018-11-15

**Notes:** Tate classify all their born-digital artworks as time-based media and use the term “medium” (which is part of the traditional museum CMS structure) to record basic requirements for the artwork performance such as “single screen” or “colour”. The discrepancy between dimensions and durations reveals the limits of the CMS in use in the gallery, which only serves traditional items in the collection. The “Not on Display” disclaimer can be argued to serve as an access statement.

# MoMA (US)

The screenshot shows a web browser window for the MoMA website. At the top, there is a navigation bar with links for 'Buy tickets', 'Plan your visit', 'Exhibitions and events', 'Art and artists' (which is underlined), 'Store', and a search icon. On the right side of the header, there is a link 'Become a member'. Below the header, there is a large image of a gallery space showing a video installation. Underneath the image, the artist's name 'Ian Cheng' and the title 'Emissary in the Squat of Gods' are displayed, along with the year '2015'. At the bottom of the page, there are links for 'Not on view', 'Medium', and 'See also: Ian Cheng has 2 works online.'

*Example view of an artwork record 1: An image slideshow is featured near the top of the page.*

This screenshot shows the same artwork record page as the first one, but with more detailed structured metadata listed below the main title. The metadata includes:

- Medium: Live simulation and story (color, sound)
- Dimensions: Infinite duration
- Credit: Fund for the Twenty-First Century
- Object number: 248.2016
- Copyright: © 2018 Ian Cheng. Courtesy of the Artist
- Department: Media and Performance Art
- A note at the bottom states: 'Research in progress; information about this work may be incomplete.'

At the bottom right, there are links for 'See also: Ian Cheng has 2 works online.' and 'See also: There are 72 software works online.'

*Example view of an artwork record 1: Structured metadata is featured near the bottom of the page. There are also links to suggested query results for related works.*



Structured data



Links to related queries



Invitation to contribute

*Example view of an artwork record 1: Licensing information is provided near the bottom of the page.*

The screenshot shows a web browser window with the URL [https://www.moma.org/collection/works/202995?classification=39&include\\_uncataloged\\_works=1&locale=en&page=1](https://www.moma.org/collection/works/202995?classification=39&include_uncataloged_works=1&locale=en&page=1). The page title is "Ian Cheng, Emissary In the Sky". The navigation bar includes "Plan your visit", "Exhibitions and events", "Art and artists" (which is underlined), "Store", and a search icon. Below the navigation is a section titled "Licensing". The text in this section states: "If you would like to reproduce an image of a work of art in MoMA's collection, or an image of a MoMA publication or archival material (including installation views, checklists, and press releases), please contact [Art Resource](#) (publication in North America) or [Scala Archives](#) (publication in all other geographic locations). All requests to license audio or video footage produced by MoMA should be addressed to Scala Archives at [firenze@scalararchives.com](mailto:firenze@scalararchives.com). Motion picture film stills or motion picture footage from films in MoMA's Film Collection cannot be licensed by MoMA/Scala. For licensing motion picture film footage it is advised to apply directly to the copyright holders. For access to motion picture film stills please contact the [Film Study Center](#). More information is also available about the [film collection](#) and the [Circulating Film and Video Library](#). If you would like to reproduce text from a MoMA publication or moma.org, please email [text\\_permissions@moma.org](mailto:text_permissions@moma.org). If you would like to publish

*Example view of an artwork record 1: There is also an option to contribute metadata or suggest corrections.*

The screenshot shows a web browser window with the same URL as the previous screenshot. The page title is "Ian Cheng, Emissary In the Sky". The navigation bar includes "Plan your visit", "Exhibitions and events", "Art and artists" (underlined), "Store", and a search icon. Below the navigation is a section titled "Feedback". The text in this section states: "This record is a [work in progress](#). If you have additional information or spotted an error, please send feedback to [digital@moma.org](mailto:digital@moma.org)". At the bottom of the page, there is a black footer bar with links to "About us", "Support", "Research and learning", and "Magazine". The footer also contains information about The Museum of Modern Art (open today, 10:30 a.m.-5:30 p.m., 11 West 53 Street, Manhattan, Please enter at 18 West 54 Street) and MoMA PS1 (open today, 12:00-6:00 p.m., 22-25 Jackson Avenue, Queens).

**Reference URL:** <https://www.moma.org>

**Date of screenshots:** 2018-11-15

**Notes:** MoMA group their born-digital artworks in categories such as “website” and “software”. Information on “medium” varies widely across these artwork categories without an apparent consistent pattern of application. It appears to function as a catch-all field in the CMS. The discrepancy between dimensions and duration reveals same traditional-media bias in the CMS here, as seen in the Tate example, too. The use of structured metadata allows the construction of natural language ‘suggestions’ for queries which produce lists of related results. The invitation to the public to contribute (albeit via email, rather than database login) is a growing trend in US cultural institutions.

# MoMA (US) continued

The screenshot shows a web browser window for the MoMA website. The URL is https://www.moma.org/collection/works/163892?classifications=40&date\_begin=Pre-1850&date\_end=2018&include uncataloged works=1&locale=en&page=1. The page title is "Fernanda Bertini Viégas, Martín Wattenberg". The main navigation menu includes "Plan your visit", "Exhibitions and events", "Art and artists" (which is underlined), "Store", and a search icon. A large thumbnail image of the artwork, titled "Wind Map", is displayed. Below the thumbnail, the artist names "Fernanda Bertini Viégas, Martín Wattenberg" and the title "Wind Map" are shown, along with the year "2012". A small button labeled "Not on view" is visible. To the right of the main content area, there is a sidebar with links related to the artists and the artwork: "Fernanda Bertini Viégas has 2 works online.", "Martin Wattenberg has 2 works online.", "There are 9,860 design works online.", and "There are 2 websites online.". At the bottom left, a note states "Gallery label from Applied Design, March 2, 2013–January 31, 2014." Navigation arrows for the slide show are at the bottom right.

*Example view of an artwork record 2: Image, text description and links to related queries are featured near the top of the page.*

The screenshot shows a web browser window for the MoMA website. The URL is https://www.moma.org/collection/works/163892?classifications=40&date\_begin=Pre-1850&date\_end=2018&include uncataloged works=1&locale=en&page=1. The main navigation menu includes "Plan your visit", "Exhibitions and events", "Art and artists" (underlined), "Store", and a search icon. Below the menu, detailed information about the artwork is listed: "Medium Interactive software", "Credit Gift of the designers", "Object number 1751.2012", "Copyright © 2018 Fernanda Bertini Viégas and Martín Wattenberg", and "Department Architecture and Design". A section titled "Installation views" is present, with a note: "We used machine learning to identify this work in photos from our exhibition history." Navigation arrows for the slide show are at the bottom right.

*Example view of an artwork record 2: Through a machine-learning experiment with Google Labs, some artwork records also feature installation views.*

Reference URL: <https://www.moma.org>

Date of screenshots: 2018-11-15

# Whitney Museum of American Art (US)

The screenshot shows a website page for the Whitney Museum of American Art. At the top, there's a navigation bar with links for VISIT, EXHIBITIONS, EVENTS, ART & ARTISTS (which is highlighted in bold), LEARN, SHOP, a search icon, BUY TICKETS, and BECOME A MEMBER. Below the navigation, a sub-navigation bar includes links for DOUGLAS DAVIS, THE WORLD'S FIRST COLLABORATIVE SENTENCE, and 1994-, CONSERVED 2012. The main content area features a large title 'THE WORLD'S FIRST COLLABORATIVE SENTENCE' in bold capital letters, followed by '1994-, CONSERVED 2012'. To the left of the title is a thumbnail image of a man with a mustache. To the right is a search bar with placeholder text 'Search by artist, artwork, or credit line' and a 'SEARCH' button. Below the search bar are two radio buttons: one for 'Collection' and one for 'Rest of site'. On the far right, there are navigation arrows (< >). The bottom section contains detailed artwork metadata:

<b>Artist</b> Douglas Davis (1933-2014)	<b>Medium</b> Website (HTML)	<b>Credit line</b> Whitney Museum of American Art, New York; Whitney Museum of American Art, New York; gift of Barbara Schwartz in honor of Eugene M. Schwartz 95.253. Originally commissioned by the Lehman College Art Gallery, The City University of New York, with the assistance of Gary Weisz, Robert Schneider, and Susan Hoeltzel.
<b>Title</b> The World's First Collaborative Sentence	<b>Dimensions</b> Dimensions variable	<b>Accession number</b> 95.253
<b>Date</b> 1994-, conserved 2012		<b>Rights and Reproductions Information</b> © artist or artist's estate

Example view of an artwork record: Only an image thumbnail and minimal amount of metadata for the record are provided.



Reference URL: <http://collection.whitney.org>

Date of screenshots: 2018-11-15

Notes: The medium is given as “website (HTML)”, but there are no other fields where more detailed preservation or performance-related information can be provided. The dimensions filed here, once again, reveals the limits of the CMS in use in the museum, which only serves the traditional items in the collection.

# Guggenheim (US)

The screenshot shows a web browser window for the Guggenheim Collection Online. The URL is https://www.guggenheim.org/artwork/15337. The page title is "COLLECTION ONLINE". A vertical sidebar on the left is titled "GUGGENHEIM" and lists links for VISIT, ART, ENGAGE, JOIN & GIVE, RESEARCH, ABOUT, and SHOP. Below this is a search bar labeled "SEARCH Q.". A banner at the bottom of the sidebar says "OPEN TOMORROW 10 AM-5:45 PM". The main content area features a grid of images from the artwork "Brandon" by Shu Lea Cheang, which includes text like "SHE'S A HE", "SWAP", "EXPOSURE", and "EXPOSE". To the right of the images is descriptive text about the artwork and its artist, along with metadata fields for artist, title, date, and medium.

**Shu Lea Cheang**  
**Brandon**

In 1993 Brandon Teena (born Teena Renae Brandon), a young transgender man, was raped and murdered in Nebraska when it was discovered that he was anatomically female. Shu Lea Cheang's 1998 work *Brandon* is a multifaceted web project that uses the nonlinear and participatory nature of the Internet as a means to explore and illuminate Brandon Teena's tragic story. From the opening image of morphing gender signifiers, Cheang propels the viewer into a probing investigation of human sexuality. It is an inquiry that utilizes hyperlinked images of a disembodied human form, once-live chat rooms on the subject of crime and punishment, and graphic moving

**ARTIST**  
Shu Lea Cheang  
b. 1954, Taiwan

**TITLE**  
Brandon

**DATE**  
1998–99

**MEDIUM**  
Interactive networked code (html, Java, Javascript and server database)

*Example view of an artwork record: Representative image, descriptive text and some metadata elements are featured near the top of the page.*



N/A

The screenshot shows a web browser window with the URL <https://www.guggenheim.org/artwork/15337>. The page is titled "Brandon" and features the Guggenheim logo on the left. A sidebar on the left includes links for VISIT, ART, ENGAGE, JOIN & GIVE, RESEARCH, ABOUT, and SHOP, along with a search bar. A banner at the bottom left says "OPEN TOMORROW 10 AM-5:45 PM". The main content area is titled "Shu Lea Cheang" and "Brandon". It describes the artwork as a multifaceted web project that uses the nonlinear and participatory nature of the Internet to explore and illuminate Brandon Teena's tragic story. The text highlights the use of morphing gender signifiers, hyperlinked images, chat rooms, and graphic moving images. It also mentions the highly mutable "skin" of the Internet and how it enables individuals to inhabit and play with different gender roles. The artwork is described as a prime example of "cyberfeminism" and utilizes technology to break down social assumptions about gender. Below this, there is a section about its presentation, mentioning the Society for Old and New Media, DeWaag, and various events like "Digi Gender Social Body: Under the Knife, Under the Spell of Anesthesia" and "Would the Jurors Please Stand Up?". The text notes its significance as a watershed moment for the movement and its place in the history of contemporary art. To the right of the text, there is a detailed list of metadata elements: ARTIST (Shu Lea Cheang, b. 1954, Taiwan); TITLE (Brandon); DATE (1998-99); MEDIUM (Interactive networked code (html, Java, Javascript and server database)); DIMENSIONS (dimensions vary with installation); CREDIT LINE (Solomon R. Guggenheim Museum, New York. Commissioned by the Solomon R. Guggenheim Museum, and produced in association with the Waag Society for Old and New Media, The Institute on the Arts and Civic Dialogue at Harvard University, and The Banff Centre, with additional funding from The Bohen Foundation, The Rockefeller Foundation, the New York Foundation for the Arts, and the Mondriaan Foundation); ACCESSION (2005.44); COPYRIGHT (© Shu Lea Cheang); ARTWORK TYPE (Internet Art); and MOVEMENT (Networked art).

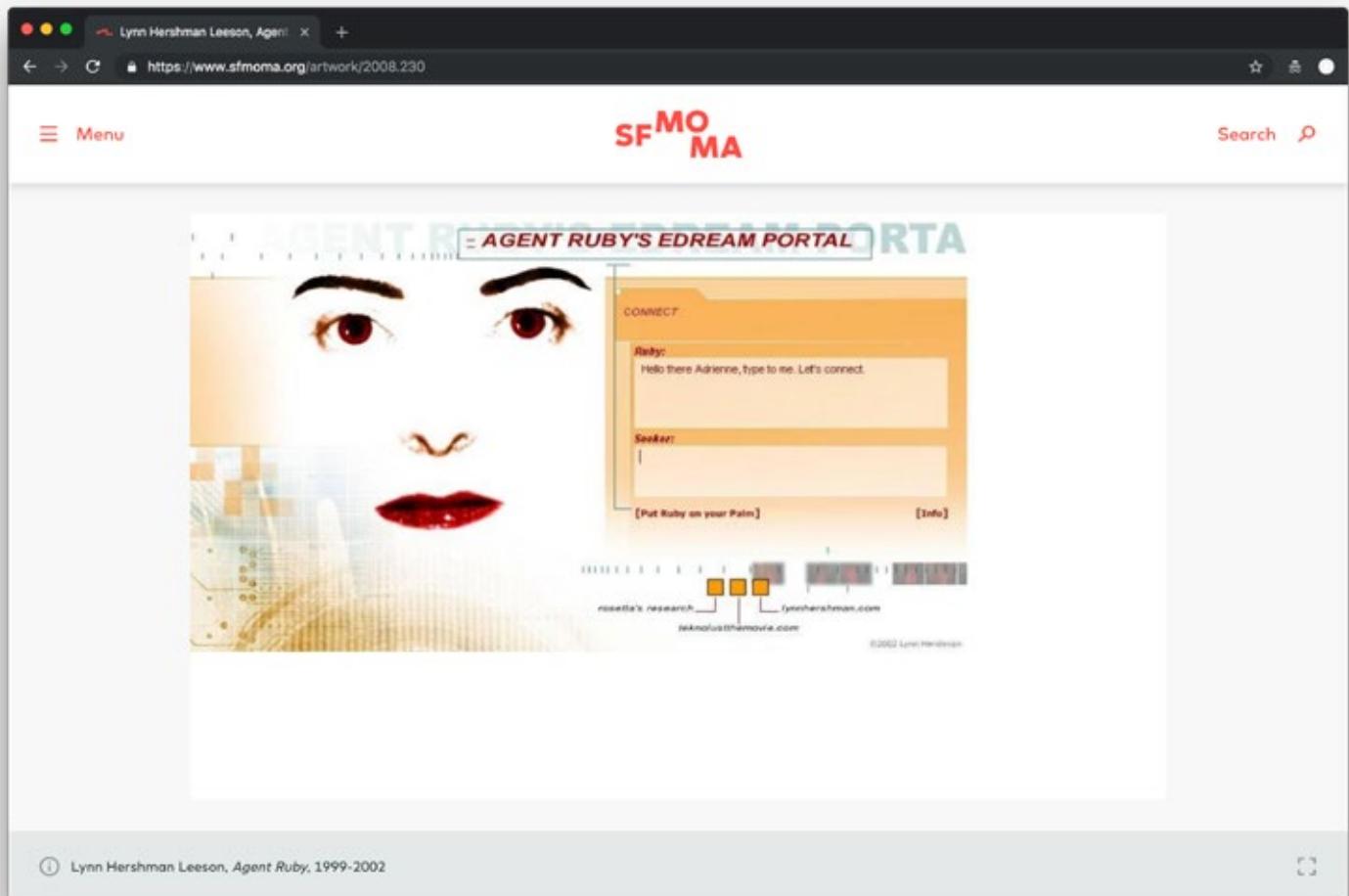
Example view of an artwork record: Descriptive text and other metadata elements continue further on the page.

Reference URL: <https://www.guggenheim.org>

Date of screenshots: 2018-11-15

**Notes:** As with other museum interfaces, the “dimensions” metadata field here once again is of no use. The metadata field “medium” here is used to provide some high level of technical information, but as noted in discussion with conservators, this information can quickly become outdated and won’t hold true for restored or variously preserved variants of the artwork necessarily. This interface uses the term “artwork type” to differentiate internet artworks from other works in the collection such as paintings, sculptures, etc. There is also a “movement” defined. This latter field is something curators might assign to artworks specially selected to be acquired in the collection, but is likely to be harder to define with a collection driven by artist submissions.

## SFMOMA (US)



Example view of an artwork record: A representative image occupies the top of the page.



Access statement

The screenshot shows a web browser window for the SFMOMA website. The URL is https://www.sfmoma.org/artwork/2008.230. The page features the SFMOMA logo in red. A navigation bar at the top includes 'Menu', 'Search', and links for 'Artwork Image' and 'Artwork Info'. The main content area is titled 'Artwork Info' and contains a table of metadata. Below the table, a section titled 'Other Works by Lynn Hershman Leeson' displays four thumbnail images of other artworks.

Artwork title	Agent Ruby	Date acquired	2008
Artist name	Lynn Hershman Leeson	Credit	Collection SFMOMA Gift of bitforms gallery, Gallery Paule Anglim, and the artist
Date created	1999-2002	Copyright	© Lynn Hershman Leeson
Classification	digital media	Permanent URL	<a href="https://www.sfmoma.org/artwork/2008.230">https://www.sfmoma.org/artwork/2008.230</a>
Medium	web project	Artwork status	<a href="#">View this work online</a>

Other Works by Lynn Hershman Leeson

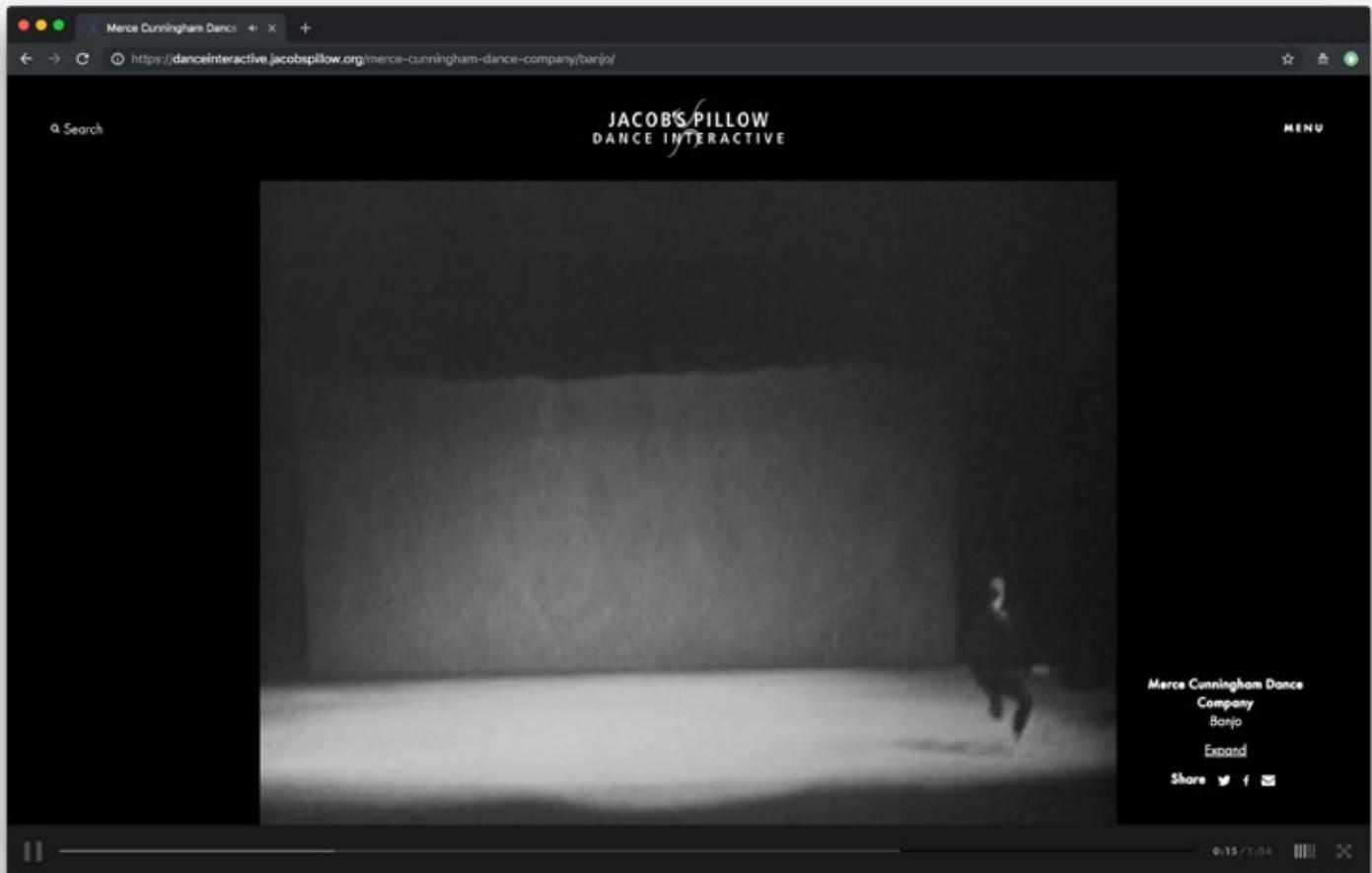
*Example view of an artwork record: Some relevant metadata elements, as well as more works by the artist, are featured near the bottom of the page.*

**Reference URL:** <https://www.sfmoma.org>

**Date of screenshots:** 2018-11-15

**Notes:** The work here is classified as “digital media”. The metadata field “medium” is used only to imply the work is web-based – “web project”. The “permanent URL” is a new element not present in other museum interfaces, but is crucial for all web-based works. Also the “status” of the artwork is made more explicit as part of the metadata record, which is helpful. In comparison, Guggenheim’s restored version of Brandon is only accessible from a text link in the artwork description (without even revealing the URL of the link). Making the access point a clear statement part of the metadata record is a much more effective user interaction pattern. Admittedly some of the other museum interfaces provide a label, such as “not on display” or “not on view”, which is also a form of access statement, but they don’t actually make the works available online, which is the ArtBase’s aim.

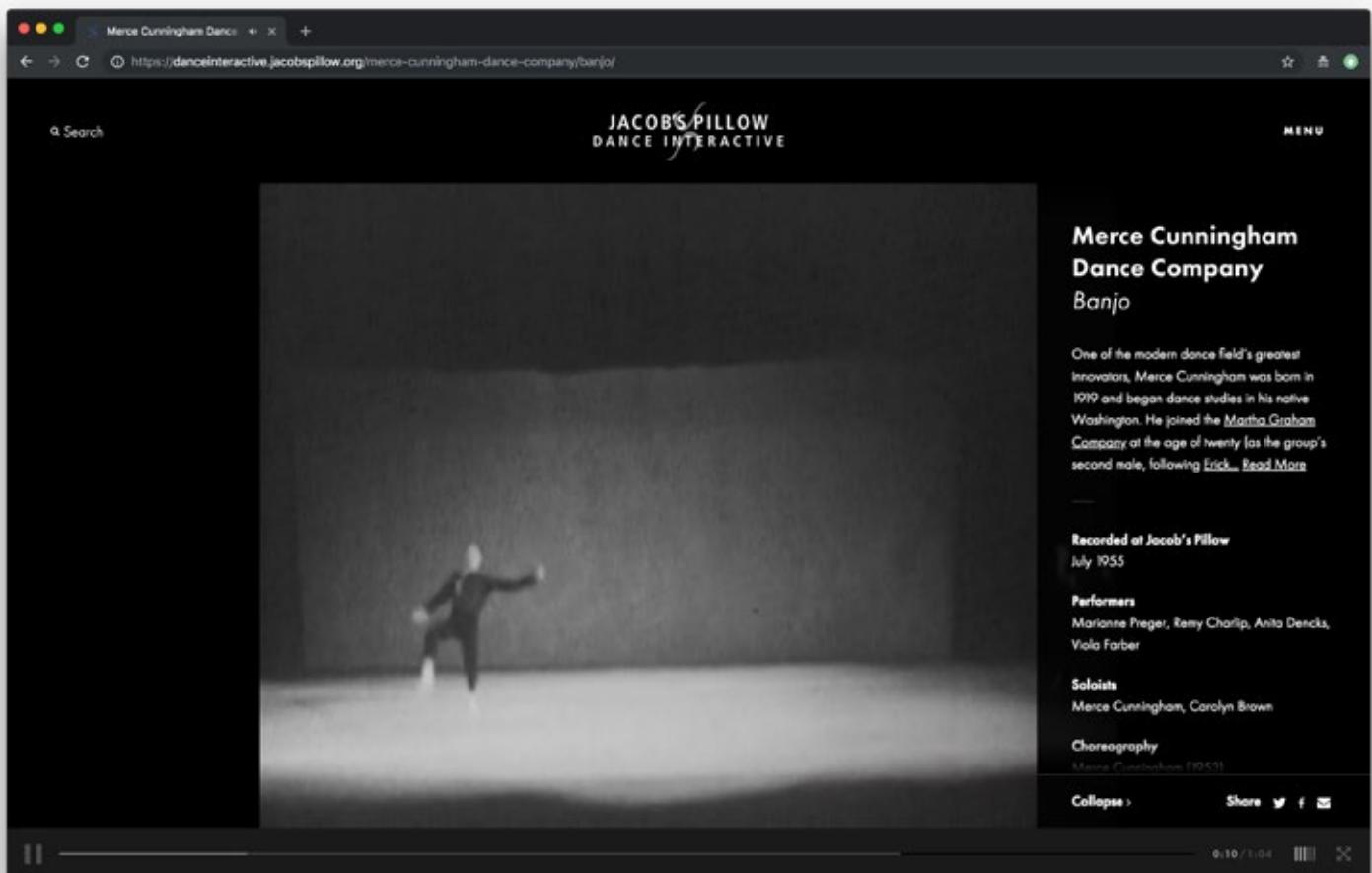
## Jacob's Pillow Dance Archive (US)



*Example view of an artwork record: Video representation featured at the top of the page.*



**Metadata in collapsed  
sidepanel**



*Example view of an artwork record: Relevant metadata elements are available as an expandable/ collapsible sidepanel on the right side of the browser window.*

**Reference URL:** <https://danceinteractive.jacobspillow.org>

**Date of screenshots:** 2018-11-20

**Notes:** While, not an archive containing digital art, this archive was suggested by one of the users during the user studies as a rare example of a performing arts archive. The collapsed metadata sidepanel seems particularly relevant for a design framework which will present artwork re-performances in the ArtBase, e.g. via Webenact or emulated representations.

# Cooper Hewitt (US)

The screenshot shows a digital artwork titled "Digital Project, Ten Thousand Cents, 2007-08". It features a green \$100 bill that has been divided into 10,000 equal parts. The main image shows a large portion of the bill with the text "FL 39923504 C" and "L12" visible. Below the main image, there is a smaller thumbnail of the same bill. The page includes a "DIGITAL PROJECT, TEN THOUSAND CENTS, 2007-08" section with a "Click the icon to save this object" button, and a "See more objects with the tag graphic design, digital computing, money, Benjamin Franklin, rendering." link.

*Example view of an artwork record: Image representation, followed by title, timeline, and a description compiled as natural language out of structured data statements, are all featured near the top of the page.*

The screenshot shows the same digital artwork record as above, but with additional content below. It includes a detailed description of the project: "To create Ten Thousand Cents, designers Aaron Koblin and Takashi Kawashima divided a scan of a \$100 bill into 10,000 equal parts. The pieces were posted to Amazon Mechanical Turk, a distributed labor tool; workers were paid \$.01 to duplicate each piece. (The total labor cost was 10,000 cents.) Use the trackpad to interact with the piece, uncovering each worker's reproduction—whether detailed, sloppy, or editorial. The project comments on crowdsourcing and individual expression within a collective work." Below this, there are sections for "Object of the Day" and "Donor information". At the bottom, there are two small thumbnail images: "Sidewall, Memory, 1977" and "Border, Pocket Change, ca. 1970".

*Example view of an artwork record: Links to suggested related works are featured further down the page.*



Structured data



Natural language summary generated from structured data

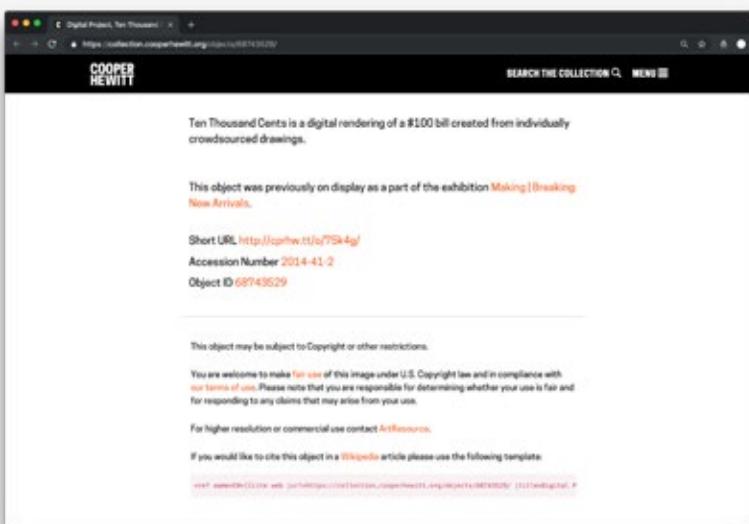


Single-object timeline

*Example view of an artwork record: Citation information and video documentation are featured near the bottom of the page.*



*Example view of an artwork record: Additional administrative metadata (identifiers and licensing) is also provided in the end of the record page.*



**Reference URL:** <https://collection.cooperhewitt.org>

**Date of screenshots:** 2018-11-15

**Notes:** This museum interface doesn't provide access to born-digital artworks per se, but represents many of the widely-used contemporary paradigms in institutional interfaces. Structured data is utilized to successfully enable multiple relations across the collection to be drawn. Additionally, the natural language descriptions generated out of structured data have been identified as a positive feature by multiple users during the user research. The timeline for the object history has also been identified as useful, and at the same time frustrating due to lack of interactivity. Finally, the only problem for longer, richer records appears to be the lack of clustering or any other hierarchy of organization for metadata, as unrelated statements seem to run on into each other without discernable visual distinction (as partly illustrated in the screenshots).

# Rijksmuseum (NL)

The screenshot shows a web browser displaying the Rijksmuseum's website for the painting 'The Milkmaid' by Johannes Vermeer. The main image is a close-up of the painting, showing a maid pouring milk from a large vessel into a smaller one. Below the image, a red box contains a heart icon with the number '18,301' and other interaction icons like a magnifying glass and a share button. To the left of the image is a small 'i' icon, and to the right is a color palette. The title 'The Milkmaid, Johannes Vermeer, c. 1660' is displayed, along with the medium 'oil on canvas, h 45.5cm x w 41cm' and a 'More details' link. A descriptive text block follows, mentioning Vermeer's artistic choice to make a simple activity like milking a statue-like figure in a brightly lit room. Below this is a button labeled 'On display in Eregalerij'. At the bottom of the page, there's a section titled 'Collections with this work' featuring thumbnail images of other Vermeer paintings and links to collections like 'Johannes Vermeer' at Rijks MUSEUM, 'Schilderijen' by Gert Tjark, and 'dada magazine' by diane.

Example view of an artwork record: High-res image and brief description are featured at the top of the page, alongside other user interaction prompts.

The image displays four separate boxes, each containing a star icon and a title, representing different design patterns for artwork records:

- Metadata clustering**
- Metadata in collapsible element**
- Access statement**
- Expression of relations**

The screenshot shows a detailed metadata record for the painting 'The Milkmaid' by Johannes Vermeer. The record is organized into several sections: Identification, Creation, Material and Technique, Subject, Acquisition and rights, Relations, and Documentation. Each section contains key information such as title, artist, date, material, and a list of subject terms or related objects.

<b>Identification</b>	<b>Title(s)</b>	The Milkmaid
	<b>Object type</b>	<a href="#">painting</a>
	<b>Object number</b>	SK-A-2344
	<b>Description</b>	Een dienstmaagd staat achter een tafel en schenkt melk uit een melkkan in een kookpot. Op de tafel staat een mand met brood en een stenen kruik, links een venster met een rieten mand en een koperen pot. Onderaan de muur rechts een rijtje tegels en een stoofje.
<b>Creation</b>	<b>Artist</b>	painter: <a href="#">Johannes Vermeer</a>
	<b>Dating</b>	c. 1660
<b>Material and Technique</b>	<b>Physical features</b>	oil on canvas
	<b>Material</b>	<a href="#">canvas, oil paint (paint)</a>
	<b>Measurements</b>	h 45.5 cm × w 41 cm
<b>Subject</b>	<b>What</b>	<ul style="list-style-type: none"> <li>• <a href="#">kitchen-maid, kitchen servant</a></li> <li>• <a href="#">milkmaid</a></li> <li>• <a href="#">milk</a></li> <li>• <a href="#">bread, loaf</a></li> <li>• <a href="#">foot-stove</a></li> <li>• <a href="#">container of ceramics, jar, jug, pot, vase</a></li> </ul>
<b>Acquisition and rights</b>	<b>Credit line</b>	Purchased with the support of the Vereniging Rembrandt
	<b>Acquisition</b>	1908
	<b>Copyright</b>	<a href="#">Public domain</a>
<b>Relations</b>	<b>Related</b>	<a href="#">Glorie van de Gouden Eeuw: De Keukenmeid</a>
<b>Documentation</b>		<ul style="list-style-type: none"> <li>• <a href="#">Vermeer : the life and work of a master</a>, J. Henderson, V. Schiferli</li> </ul>

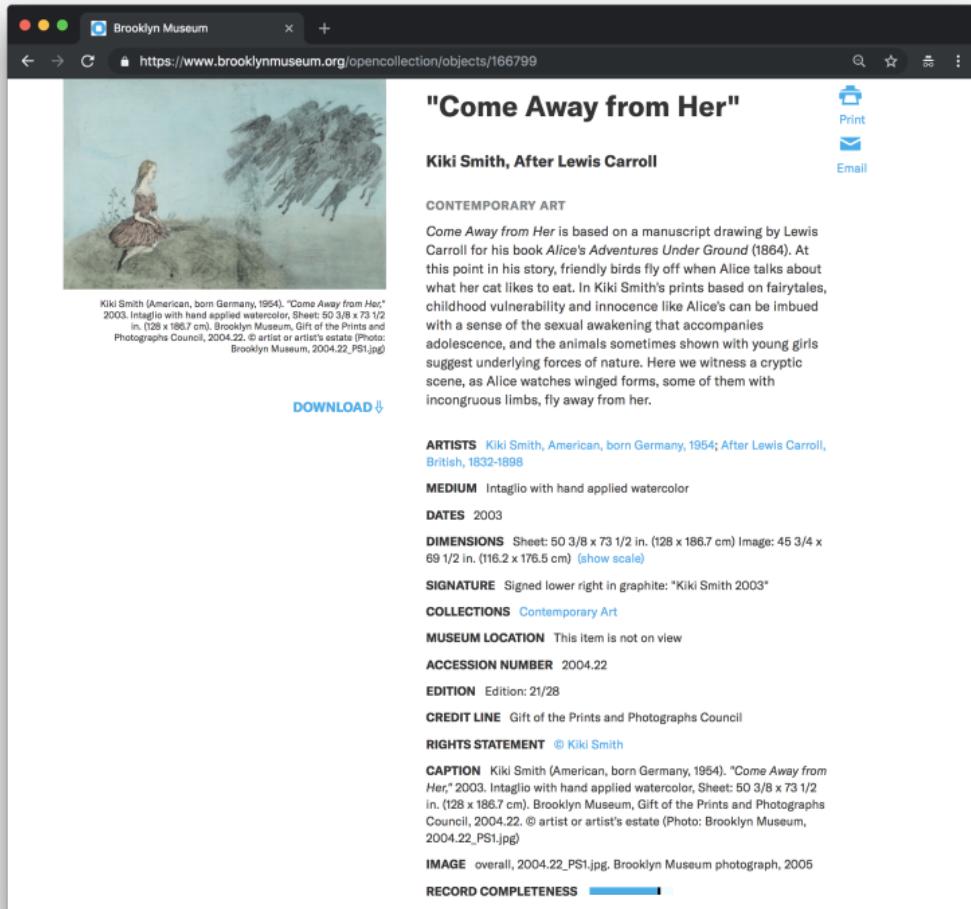
*Example view of an artwork record: Relevant metadata elements are available as a long list of clusters, which are collapsed by default, but the user can expand by clicking an “Object data” button.*

**Reference URL:** <https://www.rijksmuseum.nl>

**Date of screenshots:** 2018-05-14

**Notes:** This museum interface doesn't provide any access to born-digital artworks, but represents many of the widely-used contemporary paradigms in institutional interfaces. Providing different levels of detail at different steps in the user interface (via scroll/ collapsible elements) is a good example of how to cater to a wide variety of use-cases. Clustering relevant data under headings, and making relations explicit and explorable, are also helpful tactics of making large amounts of data more accessible to human reading vs machine processing.

# Brooklyn Museum (US)



The screenshot shows a web browser window for the Brooklyn Museum's website. The URL is https://www.brooklynmuseum.org/opencollection/objects/166799. The main content is an artwork titled "Come Away from Her" by Kiki Smith, After Lewis Carroll. The image is a black and white intaglio print with hand-applied watercolor, depicting a young girl sitting on a grassy hill looking up at birds flying away. Below the image is a caption: "Kiki Smith (American, born Germany, 1954). 'Come Away from Her,' 2003. Intaglio with hand applied watercolor, Sheet: 50 3/8 x 73 1/2 in. (128 x 186.7 cm). Brooklyn Museum, Gift of the Prints and Photographs Council, 2004.22. © artist or artist's estate (Photo: Brooklyn Museum, 2004.22\_PS1.jpg)". To the right of the image are three buttons: Print, Email, and a menu icon. The title "Come Away from Her" is in bold. Below it is the artist's name "Kiki Smith, After Lewis Carroll". A section titled "CONTEMPORARY ART" follows. The descriptive text discusses the artwork's inspiration from Lewis Carroll's "Alice's Adventures Under Ground" and its themes of childhood vulnerability and sexual awakening. Below the text are several metadata fields: ARTISTS (Kiki Smith, American, born Germany, 1954; After Lewis Carroll, British, 1832-1898), MEDIUM (Intaglio with hand applied watercolor), DATES (2003), DIMENSIONS (Sheet: 50 3/8 x 73 1/2 in. (128 x 186.7 cm) Image: 45 3/4 x 69 1/2 in. (116.2 x 176.5 cm) [show scale]), SIGNATURE (Signed lower right in graphite: "Kiki Smith 2003"), COLLECTIONS (Contemporary Art), MUSEUM LOCATION (This item is not on view), ACCESSION NUMBER (2004.22), EDITION (Edition: 21/28), CREDIT LINE (Gift of the Prints and Photographs Council), RIGHTS STATEMENT (© Kiki Smith), CAPTION (Kiki Smith (American, born Germany, 1954). "Come Away from Her," 2003. Intaglio with hand applied watercolor, Sheet: 50 3/8 x 73 1/2 in. (128 x 186.7 cm). Brooklyn Museum, Gift of the Prints and Photographs Council, 2004.22. © artist or artist's estate (Photo: Brooklyn Museum, 2004.22\_PS1.jpg))], and IMAGE (overall, 2004.22\_PS1.jpg. Brooklyn Museum photograph, 2005). A progress bar labeled "RECORD COMPLETENESS" is shown at the bottom.

Example view of an artwork record: Image thumbnail, descriptive text and a list of metadata statements are feautured near the top of the page.

## RECORD COMPLETENESS

Not every record you will find here is complete. More information is available for some works than for others, and some entries have been updated more recently. Records are frequently reviewed and revised, and we welcome any additional information you might have.

The artwork record page also features a “record completeness” statement, which (upon click) explains the variation between records in the collections and invites contributions from the public.



Metadata richness  
indicator



Invitation to contribute

Reference URL: <https://www.brooklynmuseum.org>

Date of screenshots: 2018-05-14

**Notes:** This museum interface is included in this review for its use of the concept of record completeness, or richness. This makes the explicit statement that the museum doesn't try to project some absolute truth, but rather that the collection and all archival records are a constant work-in-progress. Also this interface invites the public to contribute.

# Auckland Museum (NZ)

Example view of an artwork record: Image thumbnail, descriptive text and a list of metadata statements are feautured near the top of the page.

The screenshot shows a detailed view of an artwork record for a photograph titled "The ruins of Ypres Cathedral. N.Z. troops looking for souveniers." The page includes a header with search and navigation links, a main title, a library classification, and social sharing options. Below the title is a large image of the photograph showing soldiers in the rubble of a cathedral. The record details section contains fields for description, other number, collection area, and record richness. It also includes links for enquiring and adding to a collection. A "Catalogue" dropdown menu is visible, listing the same record details. The bottom of the page features a "Record richness" indicator with three colored squares (dark grey, light grey, and medium grey) corresponding to the richness levels mentioned in the text below.

DESCRIPTION	Hand written inscription reads: "The ruins of Ypres Cathedral. N.Z. troops looking for souveniers. 20/10/17." New Zealand soldiers looking through the rubble outside the heavily damaged leper Cathedral in Belgium.
OTHER NUMBER	PH-ALB-419
COLLECTION AREA	photography
RECORD RICHNESS	■ ■ ■

[✉ Enquire](#)  
[+ Add to My Collection](#)

**Catalogue** ▾

CATALOGUE TITLE	The ruins of Ypres Cathedral. N.Z. troops looking for souveniers.
IDENTIFIERS	PH-ALB-419 (Reference Number)
CREATOR	Sanders, Henry Armytage Bradley, 1886-1936
PERIOD	1914-1918
DESCRIPTION	Hand written inscription reads: "The ruins of Ypres Cathedral. N.Z. troops looking for souveniers. 20/10/17." New Zealand soldiers looking through the rubble outside the heavily damaged leper Cathedral in Belgium.
COLLECTION	Official H Series

The artwork record page also features a “record richness” statement with a gradation of three possible states. The condition of the collection and the possibility of errors or omissions is stated in the bottom of the page, but there is no invitation for public contribution.

OTHER NUMBER

PH-ALB-419

COLLECTION AREA

Indication of record richness

RECORD RICHNESS



Metadata richness  
indicator

Reference URL: <https://www.rijksmuseum.nl>

Date of screenshots: 2018-05-14

Notes: This museum interface is included in this review for its use of the concept of record completeness, or richness.



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## 3 Interfaces for collection entry points

# Victoria & Albert Museum (UK)

The screenshot shows the homepage of the Victoria & Albert Museum's website. At the top, there is a navigation bar with links for HOME, VISIT, WHAT'S ON, COLLECTIONS (which is underlined), LEARN, JOIN & SUPPORT, and SHOP. Below the navigation is a search icon. The main title "From the Collections" is displayed, followed by a subtext: "From ancient Chinese ceramics to Alexander McQueen evening dresses, take an incredible journey through 5000 years of human creativity with our online collections." A section titled "LATEST" features four thumbnail images: "Postmodernism" (a silver horse sculpture), "Embroidery" (a colorful floral pattern), "Fashion in Motion" (a person wearing a hat), and "Garry Fabian Miller". Below this is a "EXPLORE THE COLLECTIONS" section with a grid of 15 thumbnails categorized into groups: Raphael Cartoons, Glass, Sculpture; Knitting, Embroidery, Textiles; Tapestry, Paintings, Print; Ceramics, Quilting and patchwork, Cast collection; and Photography. At the bottom of the page is a dark footer bar with the text "Victoria and Albert Museum" and a "BACK TO THE TOP" button.

*Entry point to all collections:  
Various collection categories,  
re-presented via image  
thumbnail surrogates give a  
broad overview of collection  
holdings.*

★  
Overviews & previews

★  
Curated selections

*Entry point to a specific collection: Limited number of pre-set curated object previews are re-presented via image thumbnails, with the option to “show more”.*

**Reference URL:** <https://www.vam.ac.uk>

**Date of screenshots:** 2018-11-20

**Notes:** This museum interface doesn't provide access to born-digital artworks, but represents some contemporary paradigms in institutional interfaces, specifically the provision of some form of "overviews" and "previews" for what's in the collections. Despite lack of data visualizations, the general approach follows some of the principles of "generous interfaces" (See Whitelaw, 2015).

# Tate (UK)

The screenshot shows the Tate (UK) website's search results page for 'artwork'. At the top, there's a navigation bar with links for 'ART & ARTISTS', 'EXHIBITIONS & EVENTS', and 'PLAN YOUR VISIT'. A 'BECOME A MEMBER' button is also visible. Below the navigation is a search bar with the placeholder 'Search' and a magnifying glass icon. Underneath the search bar is a horizontal menu with categories: 'All (127,679)', 'Artists (4,986)', 'Artworks (79,245)' (which is highlighted in blue), 'Exhibitions & Events (5,018)', 'Displays (128)', 'Archive Items (22,566)', 'Video & Audio (4,954)', 'In Depth (3,596)', and 'Location (104)'. A 'Refine your search' dropdown arrow is located to the right of the menu. Below this, a message says 'Showing 1–20 of 79,245 results'. Four artwork thumbnails are displayed in a row: 1. 'Ophelia' by Sir John Everett Millais, Bt (1851–2). 2. 'Bust of a Woman' by Pablo Picasso (1909). 3. 'Whaam!' by Roy Lichtenstein (1963). 4. 'Salisbury Cathedral from the Meadows' by John Constable (exhibited 1831). Each thumbnail has a caption below it. A small green dot icon followed by text indicating where the artwork is on display is present under each entry.

Entry point to the collection: The interface offers overviews (in the form of categories) and previews (via image thumbnail surrogates).



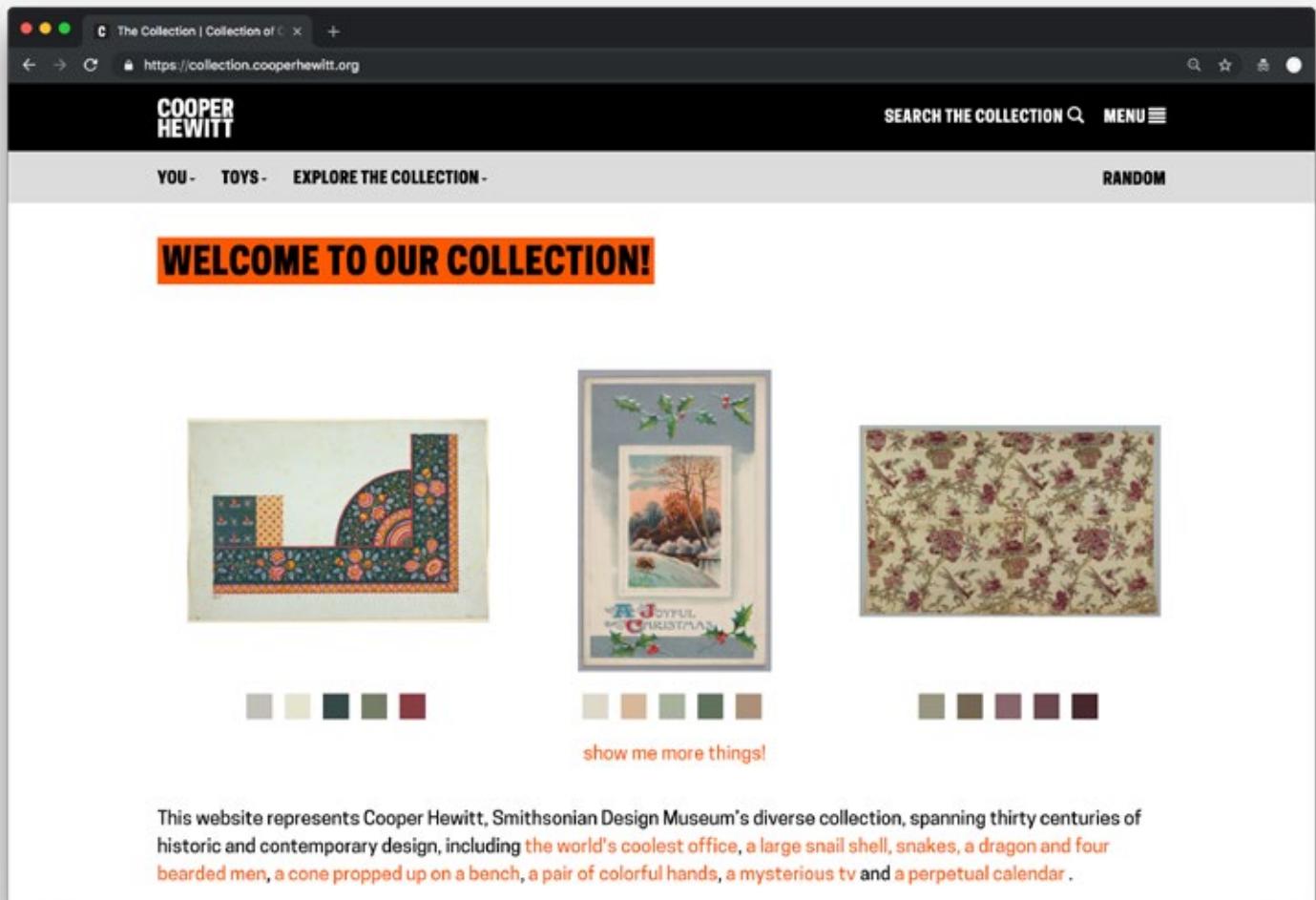
## Overviews & previews

Reference URL: <https://www.tate.org.uk>

Date of screenshots: 2018-11-15

Notes: This interface offers different ways to 'slice' the collection into categories, but does not take a generous approach in visualizing showing specific areas of the collection. The search box still holds the most prominent place in the interface.

# Cooper Hewitt (US)



This website represents Cooper Hewitt, Smithsonian Design Museum's diverse collection, spanning thirty centuries of historic and contemporary design, including [the world's coolest office](#), [a large snail shell](#), [snakes](#), [a dragon](#) and [four bearded men](#), [a cone propped up on a bench](#), [a pair of colorful hands](#), [a mysterious tv](#) and [a perpetual calendar](#).

*Entry point to the collection: Six (random) object previews are featured, with option to “show more”. In addition, descriptive text offers various possible ‘routes’ through the collection to visitors.*

★  
Generous interfaces

★  
Randomization

★  
SPARQL query GUI

**Reference URL:** <https://collection.cooperhewitt.org>

**Date of screenshots:** 2018-11-15

**Notes:** This interface takes a generous approach, by removing the search box from a central position on the page. Instead, it previews random items from the collection, which are reloaded every time the user visits the collection. Additionally, the descriptive text provides more ‘fun’ entry points into the collection and conceptually links well to the way users can navigate the collection through the natural language summaries generated from the structured data associated with each object.

# MoMA (US)

The screenshot shows the MoMA collection search interface. At the top, there is a navigation bar with links to 'Plan your visit', 'Exhibitions and events', 'Art and artists' (which is underlined), 'Store', and a search icon. Below the navigation is a search bar labeled 'Search artists and works' with a magnifying glass icon. Underneath the search bar is a 'Filters' section with a dropdown menu set to 'Software (72)'. It also includes date filters for 'Pre-1850' through '2018', a checkbox for 'Recent acquisition' (unchecked), and a checked checkbox for 'Include uncataloged works'. There are also two radio buttons for 'Has image' (unchecked) and 'On view' (unchecked). Below the filters, a message says 'Showing 72 out of 79,873 works online'. The main content area displays six collection items in a grid:

Image	Artist / Title	Year
	Ian Cheng Emissary Forks at Perfect Perfection 2015 - 2016	
	Ian Cheng Emissary in the Squat 2015	
	Andrew John Hessel, Jr. Synthetic PhiX174 Bacteriophage 2014	
	Andrew John Hessel, Jr. Synthetic PhiX174 Bacteriophage 2014	
	Andrew John Hessel, Jr. Synthetic PhiX174 Bacteriophage 2014	

*Entry point to the collection: The search box is centred at the top of the page. Advanced search is facilitated via filters and previews (with image thumbnail surrogates).*



## Overviews & previews

The Collection | MoMA

Showing 68,750 out of 79,873 works online

Image	Title	Date
	Wyatt Kahn Untitled 2018	
	Martirene Alcántara Speculum (From the series "In Bamboo") 2017	
	Archi-Union Architects "In Bamboo" Cultural Exchange Program 2017	
	Fiona Banner The Vanity Press 2018	2017
	Sofia Borges Yellow Chalk 2017	
	Matthew Brannon Concerning Vietnam: One Day in the Life of a Vietnamese Soldier 2017	
	Silvia Buonvicini Sans titre 2017	
	Maurizio Cattelan Untitled (for Parkett, no. 100) 2017	
	Marlene Dumas Art Is/Always/Having to Be Seen 2017	
	Shannon Ebner PHOTORAMA 2017	
	Nicole Eisenman Beer Garden with Big Holes 2012-17	
	Omer Fast White Male Selfies (for Parkett, no. 100) 2017	

*Entry point to the collection: Scrolling past the search box and filters, offers previews of everything in the collection (with image thumbnail surrogates).*

Reference URL: <https://www.moma.org>

Date of screenshots: 2018-11-15

Notes: This interface offers different ways to “filter” the collection via categories and temporal dimensions, but does not take a generous approach in visualizing specific areas of the collection. The search box still holds the most prominent place in the interface.

# Whitney Museum of American Art (US)

The screenshot shows the Whitney Museum of American Art's collection browsing interface. At the top, there is a navigation bar with links for VISIT, EXHIBITIONS, EVENTS, ART & ARTISTS (which is highlighted in bold), LEARN, SHOP, a search icon, BUY TICKETS, and BECOME A MEMBER. Below the navigation bar, a section titled "BROWSE ALL ARTISTS" is displayed, along with a search bar and filter options for "Collection" or "Rest of site". A grid of artist profiles is shown, each featuring a thumbnail image, the artist's name, and the number of works. The grid includes artists like Berenice Abbott, Matthew Abbott, Zaroukie Abdalian, Michele Abeles, Sigmund Abeles, Ida Abelman, Satoru Abe, Marina Abramović, Vito Acconci, and Mark Achbar. There are also two crossed-out entries for Zaroukie Abdalian and Michele Abeles. A navigation bar at the bottom right shows pages 1 through 4, with "1–36 of 139" indicated.

*Entry point to the collection: Some filters and sorting utilities are featured near the top of the page, followed by previews (with image thumbnail surrogates).*



## Overviews & previews

Reference URL: <https://collection.whitney.org>

Date of screenshots: 2018-11-15

Notes: This interface provides very few ways of discovering items in the collection without having a very specific search query (and search is also limited to knowing the exact artwork title or name of the artist). The use of previews does not mitigate this and casual browsing is poorly facilitated.

# SFMOMA (US)

The screenshot shows a grid of eight artworks from the SFMOMA collection. Each item includes a thumbnail image, the artist's name, and the title.

Artist / Title	Description
Frank Lobdell Summer 1965	1965
Martin Venezky 2001 Sundance Film Festival Postcard	2000
Henry Wessel Civic Center Plaza, San Francisco, California	1985
Loom Movement 4, from Thailand Unfolding House	1994-1996
Martin Venezky Open, Number 3	2000
Dr. William J. Pierce Spirit Photographs	1903
Judith Joy Ross Susan Ravitz, Protesting the U.S. War in Iraq, Fort Dix, New Jersey	From the series <i>Continental Divide</i>
Henry Wessel Untitled, from the series <i>Continental Divide</i>	

*Entry point to the collection: Some overviews and previews are provided based on a few categories (e.g. “collecting areas”).*



Randomization



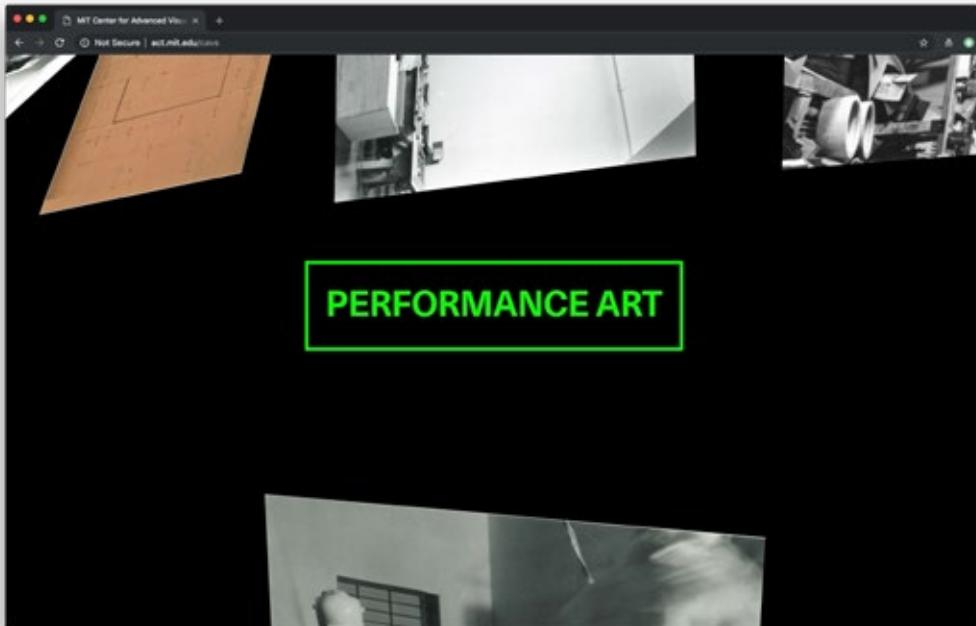
Overviews & previews

**Reference URL:** <https://www.sfmoma.org>

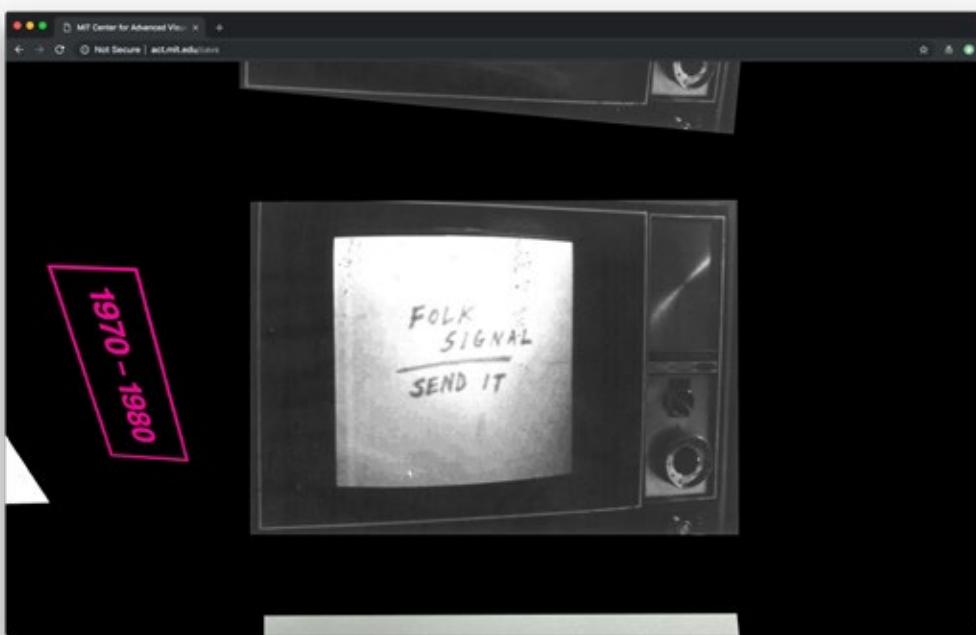
**Date of screenshots:** 2018-11-15

**Notes:** This interface takes an exploratory approach to the collection offering overviews and previews across a few different categories, but is more limited in scope compared to the V&A or Cooper Hewitt examples. Search box and filters are available as a second step via the “Explore the collection” button. It does feature eight random items from the collection (shown above), which re-load every time the user visits the collection entry page.

# MIT's Center for Advanced Visual Studies (CAVS) (US)



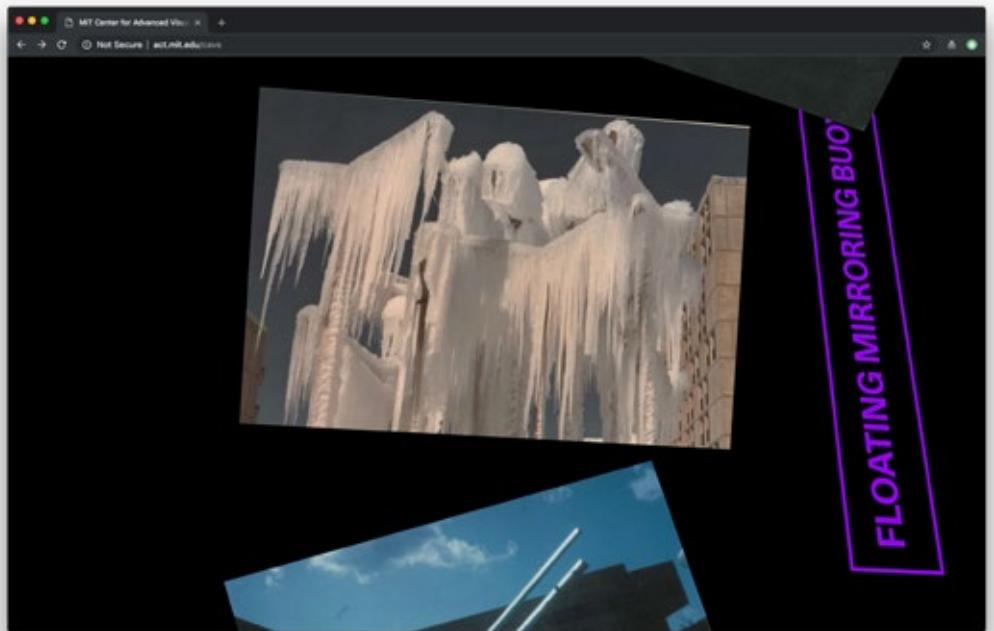
Entry point to the collection:  
The collection can be  
navigated via a randomized  
3D environment of collection  
materials.



Entry point to the collection  
(cont.).



*Entry point to the collection  
(cont.).*



*Example view of an item record: An image and minimal amount of metadata represent the item.*

A screenshot of a web browser displaying an item record for "Butler Fountain" by Carl Nesjar. The main image shows a large, modern sculpture made of long, thin, light-colored panels that reflect the surrounding environment. Below the image is a caption and descriptive text.

Part of: [Butler Fountain](#) by Carl Nesjar

**Butler Fountain, 1983**  
Photograph of CAVS Fellow Carl Nesjar's sculpture "The Butler Fountain," for the State University College at Buffalo. Photograph: unknown.

Subjects: [Art works](#), [Sculpture](#), [Fountains](#) Format: [sculpture \[visual works\]](#)  
Holding Institution: Massachusetts Institute of Technology, Program in Art, Culture and Technology

**Reference URL:** <http://act.mit.edu/cavs>

**Date of screenshots:** 2018-11-20

**Notes:** This interface takes a generous approach to giving an overview of the collection – in the form of an experimental 3D viewing plane where order is randomised and categories branch out vertically and horizontally. This is a creative solution to encourage users to interact with what is otherwise primarily static documentation of time-based and performance-based artworks. The work/documentation records reveal very little metadata and a frustrating aspect of user interaction here is the inability to “go back” to the 3D environment after opening an item record. Instead, the user is taken back to the opening screen of the collection. There are, however, other more standard ways to browse (or search) lists of work previews which can be sorted and filtered.

# Google Arts & Culture

The screenshot shows the 'Explore' section of the Google Arts & Culture website. At the top, there's a navigation bar with 'HOME', 'EXPLORE' (which is underlined), 'NEARBY', 'PROFILE', a search icon, and a 'SIGN IN' button. Below the navigation, there's a 'Highlights' section with a link to 'Browse featured content'. Three cards are displayed: 'Art Camera' (Explore high-definition artworks), '360° videos' (Experience culture in 360 degrees), and 'Street View' (Tour famous sites and landmarks). The 'Categories' section follows, with links to 'Artists', 'Mediums', 'Art Movements', 'Historic Events', and 'Historical Figures'. Each category has a thumbnail image and a count of items. Below this is the 'Collections' section, which links to over 1,000 museums worldwide, featuring thumbnails of various exhibits.

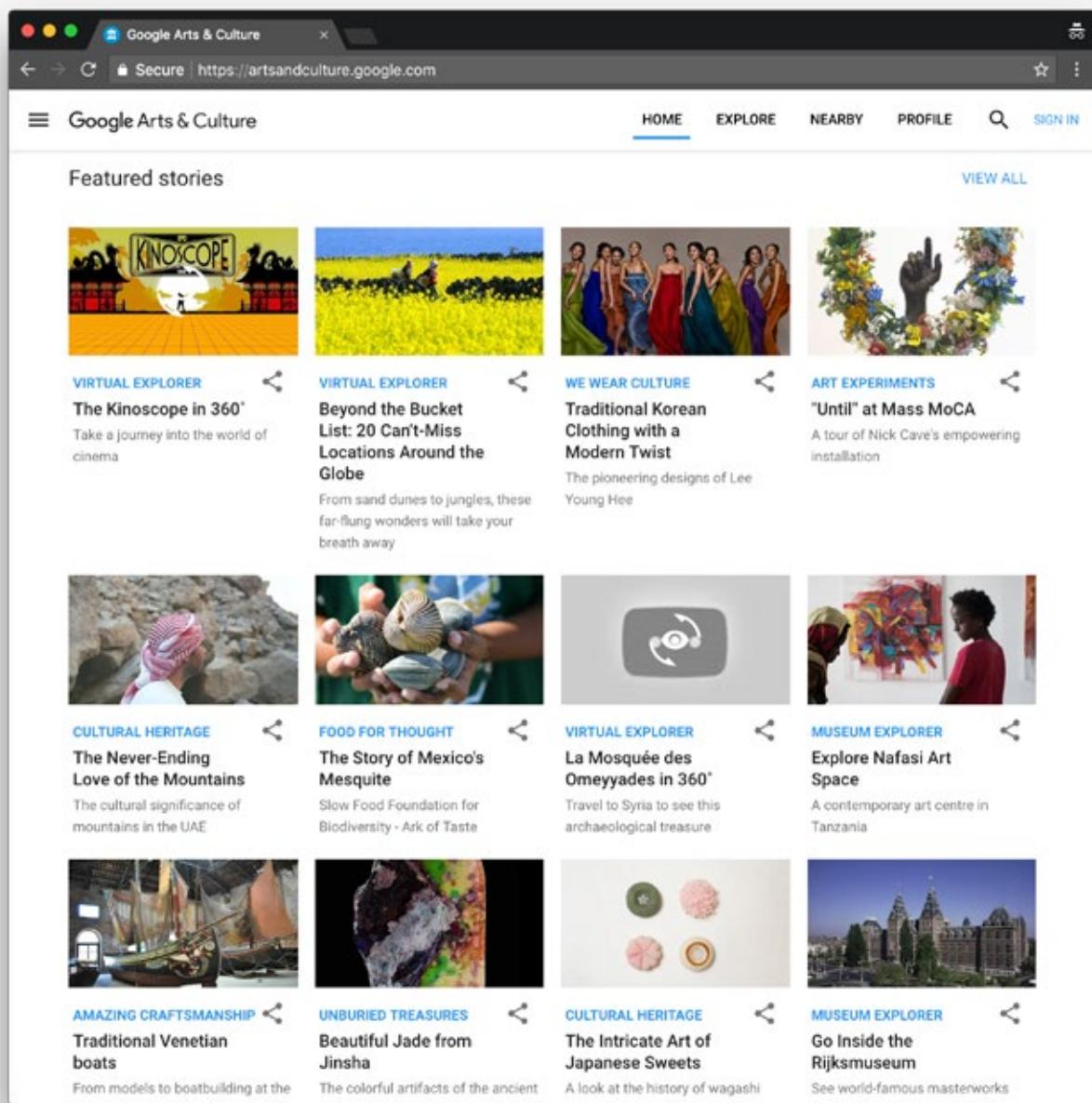
*Entry point to all collections: Overviews and previews (with image thumbnail surrogates) are provided based on various categorizations.*



Overviews & previews



Curated selections



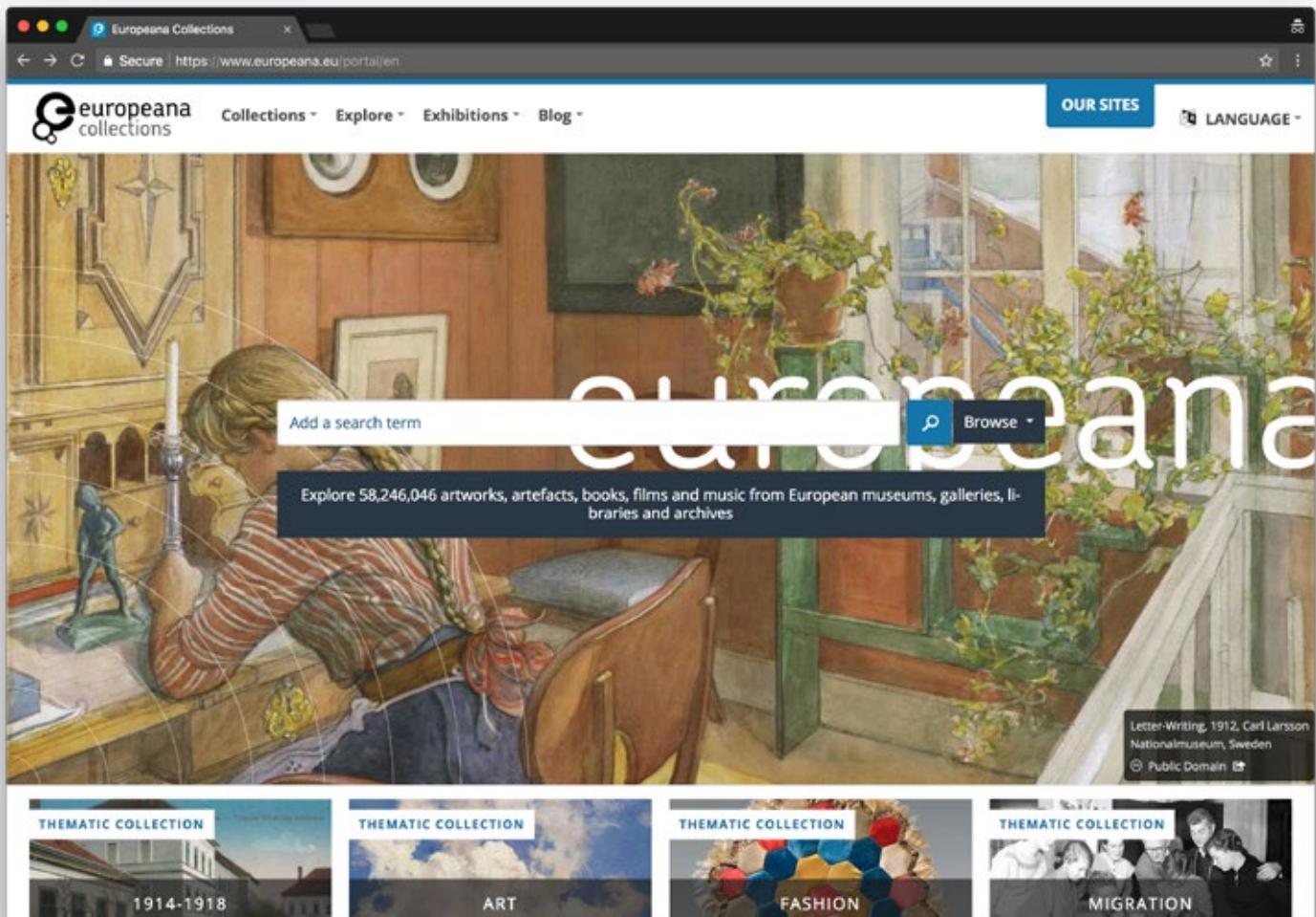
*Entry point to all collections: Curated selections are also represented as previews (with image thumbnail surrogates).*

**Reference URL:** <https://artsandculture.google.com>

**Date of screenshots:** 2018-05-14

**Notes:** While, not an institutional interface, this interface acts as an aggregator of many different institutional collections, as well as additional, specially-commissioned content. It utilizes many of the popular paradigms in collection interface design practices, such as overviews and previews, curated selections, minimizing the role of direct search and focusing on exploratory browsing. However, the primary issue with the implementation of this approach in the context of an aggregator is how easy it is to flatten and/or altogether remove the specific cultural context around each collection, and thereby inhibit the ability to interpret and make meaning of individual collections.

# Europeana (EU)



Entry point to all collections.

**Reference URL:** <https://www.europeana.eu>

**Date of screenshots:** 2018-09-12

**Notes:** Despite a recent redesign, the Europeana portal continues to uphold the dominance of the search box as primary navigation paradigm. The desire to emulate the “Google experience” has been well documented in research papers on collection interfaces, but when even Google’s Arts&Culture portal is moving away from this paradigm, it’s surprising that other cultural initiatives are still upholding it. There are some curated selections and additional browsing utilities further into the interface, but search remains the primary entry point.



Curated selections

# DPLA (US)

The screenshot shows the DPLA homepage. At the top, there's a navigation bar with links for "BROWSE BY TOPIC", "BROWSE BY PARTNER", "EXHIBITIONS", "PRIMARY SOURCE SETS", "MY LISTS", "ABOUT DPLA", "NEWS", and "DPLA PRO". Below the navigation is the DPLA logo and the text "DIGITAL PUBLIC LIBRARY OF AMERICA". A prominent orange "Donate" button is on the right. The main content area features a large text overlay: "Discover 29,467,826 images, texts, videos, and sounds from across the United States". Below this is a search bar with the placeholder "Search the collection" and a blue "Search" button. Underneath the search bar are links for "Browse by Topic" and "New? Start Here". A large callout box in the center says "Teaching and Learning with DPLA" and provides a link to "Learn more". To the left of the callout is a thumbnail image of the "Primary Source Sets" page. At the bottom of the main content area, there's a section for "Online Exhibitions" with a "Browse all Exhibitions >" link and a small image strip.

*Entry point to all collections.*

★  
Curated selections

Reference URL: <https://dp.la>

Date of screenshots: 2018-09-12

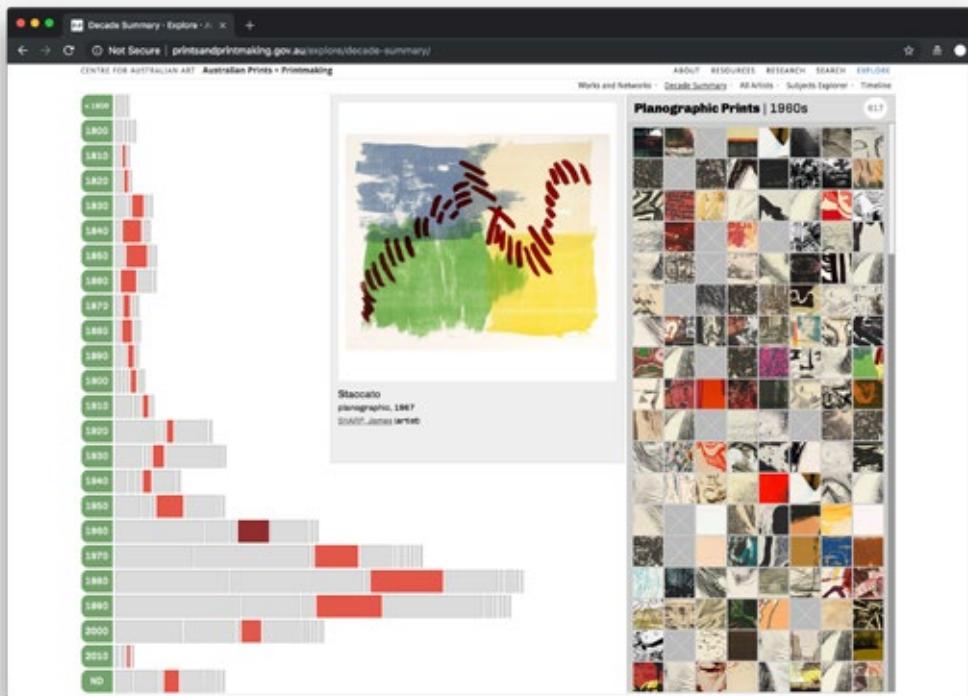
Notes: Similar to the Europeana portal, the DPLA portal focuses on search as a primary navigation mode. There are some curated selections and additional browsing utilities, but search remains primary entry point.



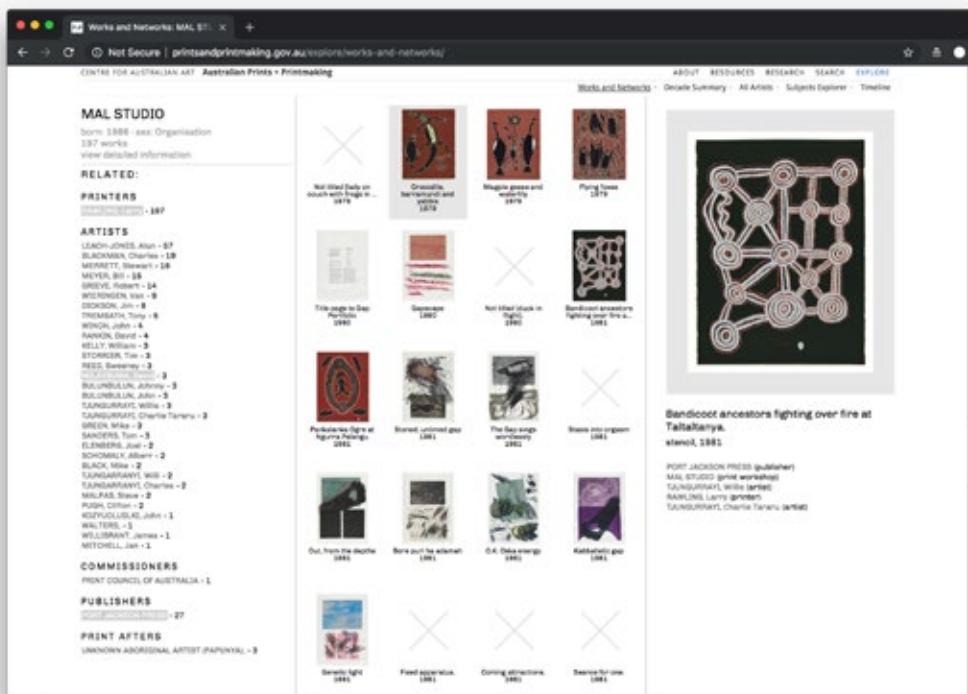
---

## 4 Interfaces utilizing collection overview visualizations

# The work of Mitchell Whitelaw



Example collection overview interface 1: Items are visualized on a timeline and supplemented by thumbnail previews.



Example collection overview interface 1: Items are visualized based on categories of relations and supplemented by thumbnail previews.



Generous interfaces

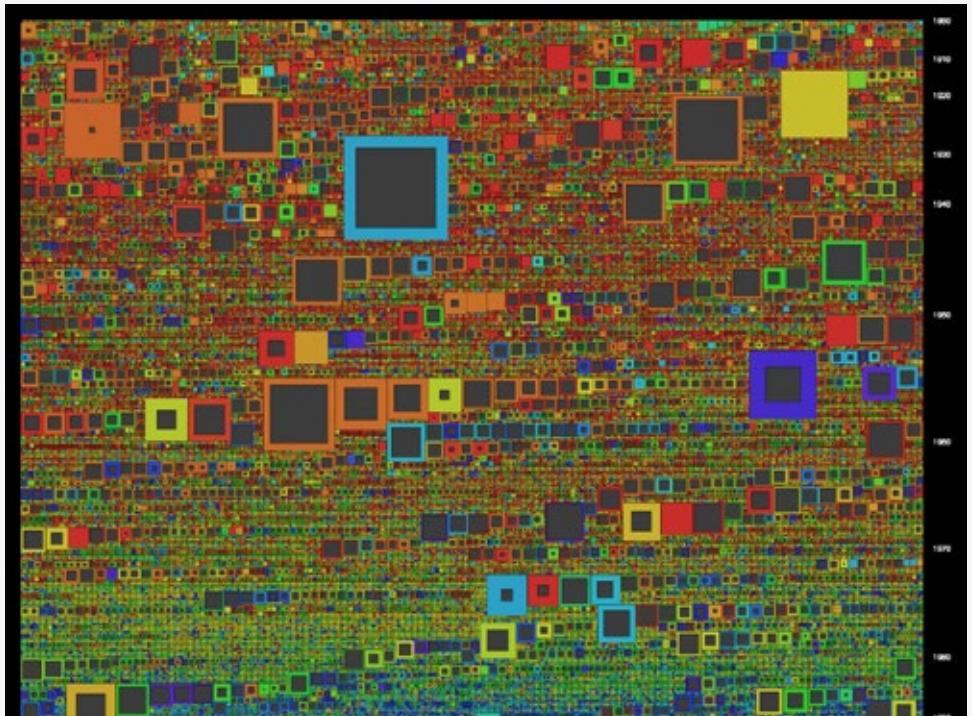


Overviews & previews



Data viz

*Example collection overview interface 2: Items are visualized on a timeline using abstract surrogate representation.*



*Example collection overview interface 2: Video screenshot shows the possible interactions with the abstract representations.*



**Reference URL:** <http://mtchl.net/category/projects/>

**Date of screenshots:** 2018-11-20

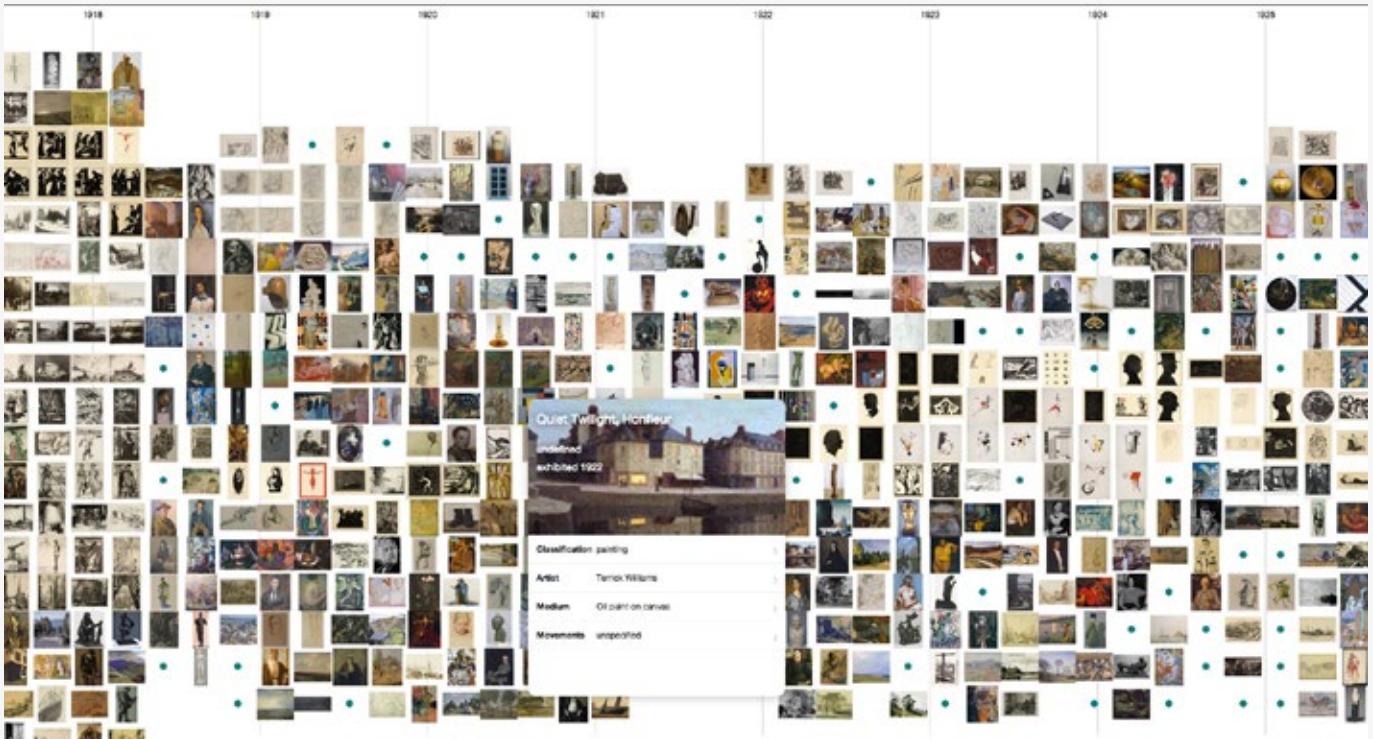
**Notes:** Designer and academic Mitchell Whitelaw developed the generous interfaces concept and design approach (Whitelaw, 2015). His interface design work has been influential among practitioners and researchers in the field. The various data visualization styles and techniques present a compelling overview of a collection's holdings. The only issue to keep in mind with this approach is the inevitable limitation of data visualization when it comes to heterogeneous ("unclean") datasets and the possibility to omit or obscure outliers in the dataset.



**Multi-object timeline**



# The work of Florian Kräutli



Example collection overview prototype: Items are visualized on a timeline and supplemented by thumbnail previews. Additional metadata per item is available on click.



Generous interfaces



Overviews & previews



Data viz



Multi-object timeline

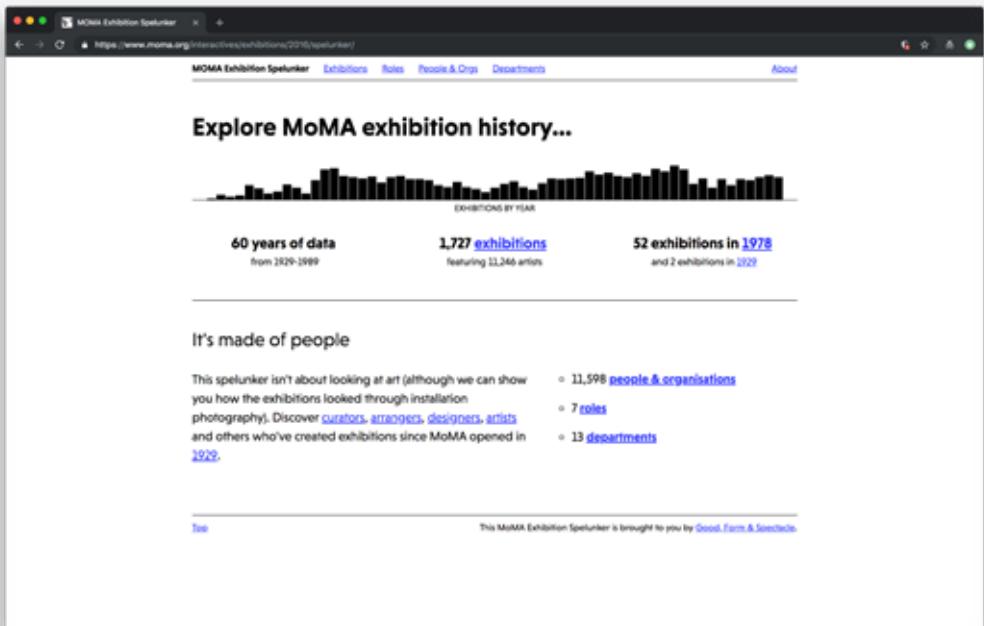
**Reference URL:** <http://www.kraeutli.com/index.php/category/projects/>

**Date of screenshots:** 2018-11-20

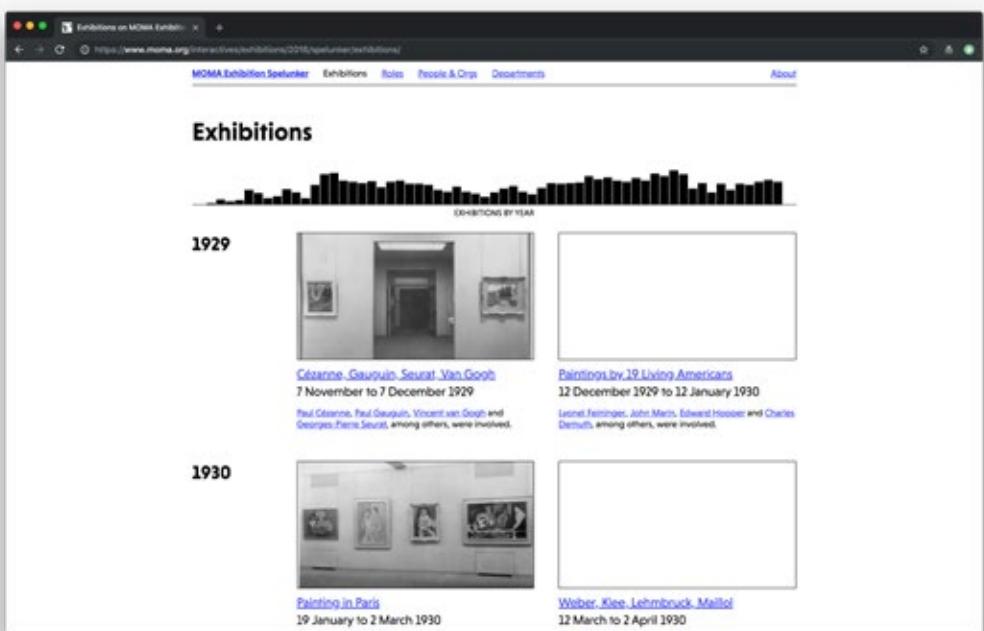
**Notes:** Designer and researcher Florian Kräutli has developed numerous collection interface prototypes and data visualizations aiming to tackle various questions around item exploration (particularly in relation to time) in collection interfaces. While these interfaces present dynamic and engaging user experiences, they work well with large collections of materials with visual surrogates (such as digitized image representations) and homogeneous metadata. Implementing such an approach to a highly heterogeneous dataset of born-digital artworks (where relations between time of creation and duration of performativity are more complex) remains limited.

# The work of George Oates

Example collection overview interface: Items are visualized on a timeline and some data stats are also included.



Example collection overview interface: Items are visualized on a timeline and supplemented by thumbnail previews.



Generous interfaces



Data viz



Multi-object timeline

Reference URL: <http://goodformandspectacle.com/>

Date of screenshots: 2018-11-20

Notes: Designer George Oates has developed the concept of “spelunkers”: explorative interfaces presenting alternative views of collections, or sometimes just sections of collections. Her work often involves creative uses of data (and linked data) to reveal unusual aspects of collections – distinct from the traditional approach of simply listing works by date, author or category. Her approach, however, is bespoke to each individual collection and elements from these interfaces are not necessarily transferable across collections.

# Rethinking Guernica



Example timeline view: Events and archival documents all relating to a single artwork are visualized on a timeline, supplemented by thumbnail previews. Additional metadata per item is available on click.

★  
Generous interfaces

Reference URL: <https://guernica.museoreinasofia.es/cronologia/en/>

Date of screenshots: 2018-11-20

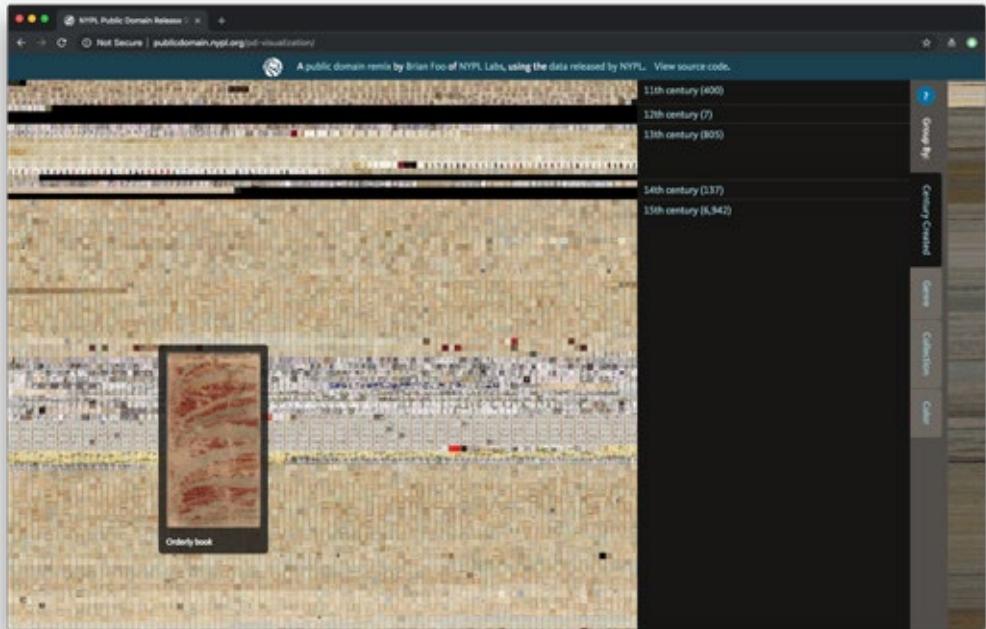
★  
Data viz

**Notes:** While not strictly a collection overview interface, this interface bears relation to the design examples reviewed so far. This chronology timeline presents a range of events and documents all relating to a single artwork. The project of researching the complex history of Guernica has generated a vast amount of data which benefits from visualization just as other digital collections. This dynamic data visualization is a useful reference point for the ArtBase, since it sets an example where a timeline visualization can be useful even if it tracks the history of a single artwork vs visualizations of all artworks in the collection. Data is revealed in different degrees of granularity depending on user interaction.

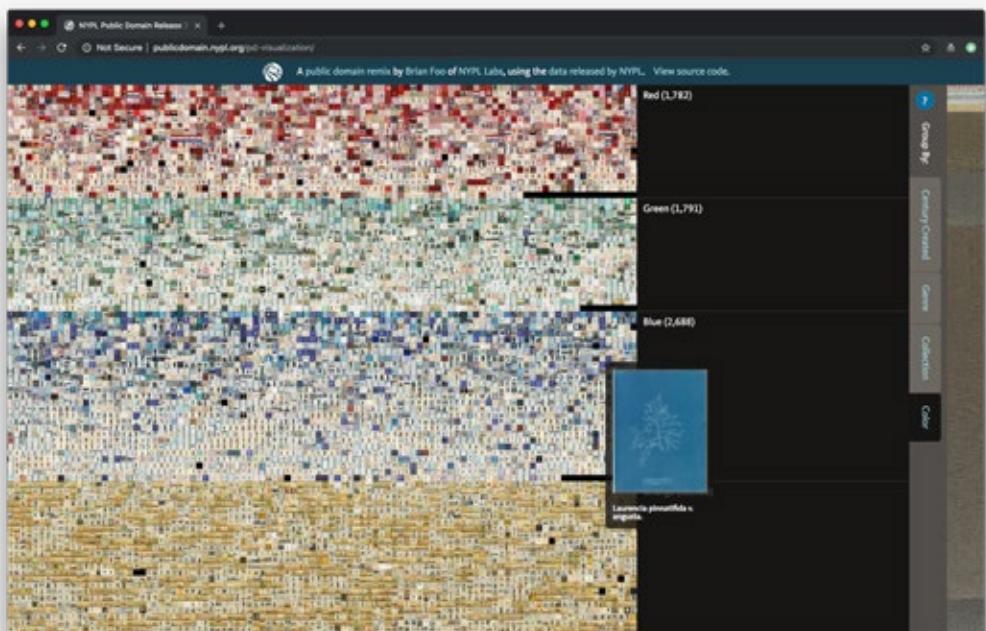
★  
Single-object timeline

# NYPL Labs

*Example collection overview interface 1: Items are visualized on a timeline and supplemented by thumbnail previews.*



*Example collection overview interface 2: Items are visualized based on colour similarity and supplemented by thumbnail previews.*



Generous interfaces



Data viz



Multi-object timeline



Sort by color

**Reference URL:** <http://publicdomain.nypl.org/pd-visualization/>

**Date of screenshots:** 2018-11-20

**Notes:** NYPL Labs have developed a number of experimental interface prototypes aiming to visualise the collections according to different categories or criteria. A timeline approach is an already standard method for data visualization, which in this particular instance is supplemented by the option to also sort the collection based on color similarity, achieved through advances in computer vision and machine learning.

# Google Arts & Culture

This screenshot shows the Google Arts & Culture interface for the artist Rembrandt. At the top, there's a navigation bar with links for HOME, EXPLORE, NEARBY, PROFILE, and SIGN IN. Below the navigation is a search bar. The main content area is titled "Discover this artist" and shows a grid of 1,705 items related to Rembrandt. The items include various paintings and drawings. A specific painting of a man is highlighted in the center. Below the grid, a quote by Rembrandt is displayed: "I can't paint the way they want me to paint and they know that too." At the bottom of the page, there's a footer with the Rembrandt name and birth/death dates: "Rembrandt Jan Uylenburgh - Oct 6, 1606".

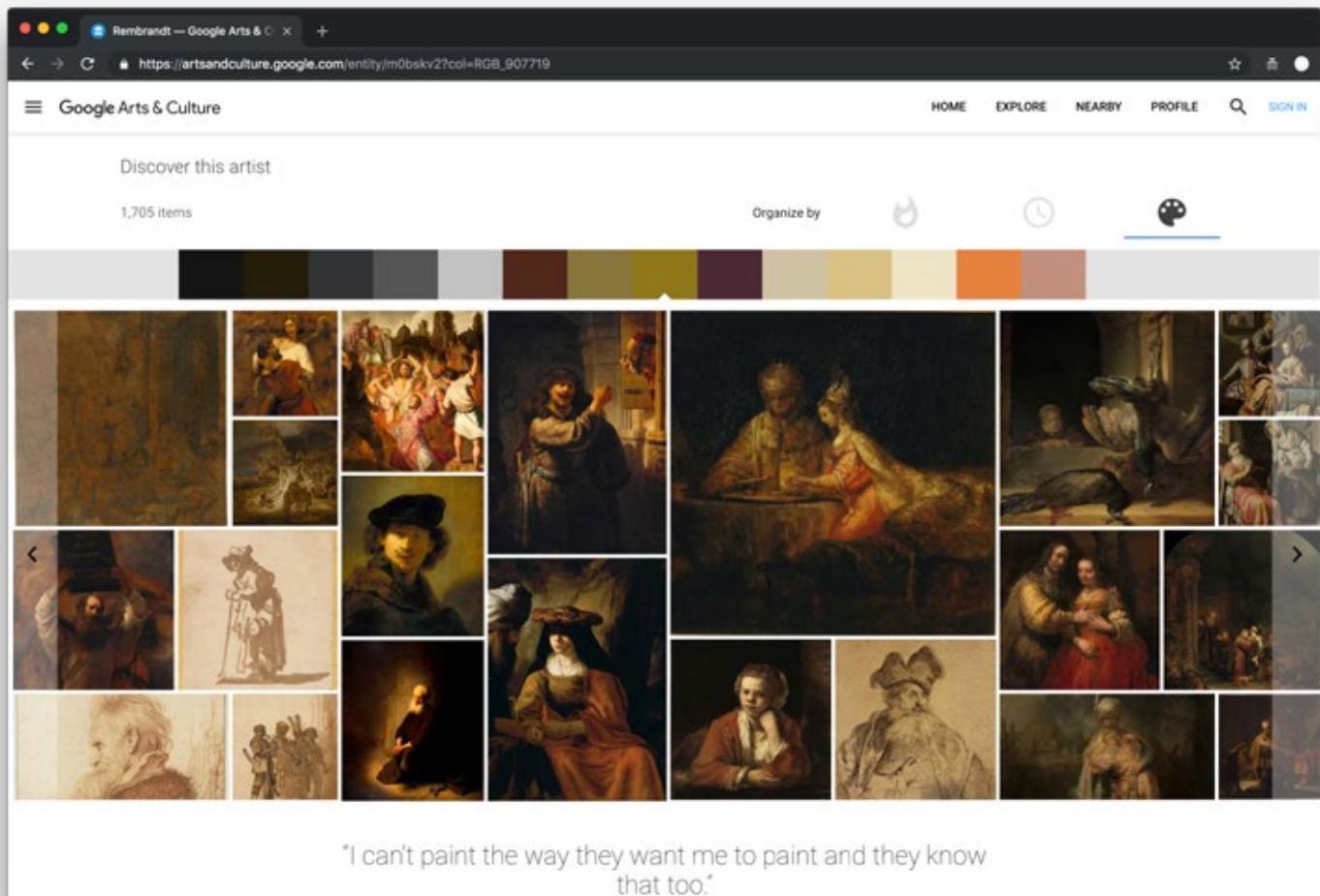
Overview interface for all items related to a specific artist (or other search term):  
This view can be sorted by popularity, time periods, or color.

This screenshot shows the Google Arts & Culture interface for the artist Rembrandt, similar to the first one but with a timeline at the top. The timeline shows years from 1634 to 1656. The main content area displays a grid of artworks, including paintings and drawings, arranged in a collage-like fashion. A quote by Rembrandt is visible at the bottom: "I can't paint the way they want me to paint and they know that too."

★  
Generous interfaces

★  
Overviews & previews

★  
Data viz



*Overview interface for all items related to a specific artist: This view can be sorted by color similarity based on a value within the color palette of the collection overview.*



**Multi-object timeline**



**Sort by color**

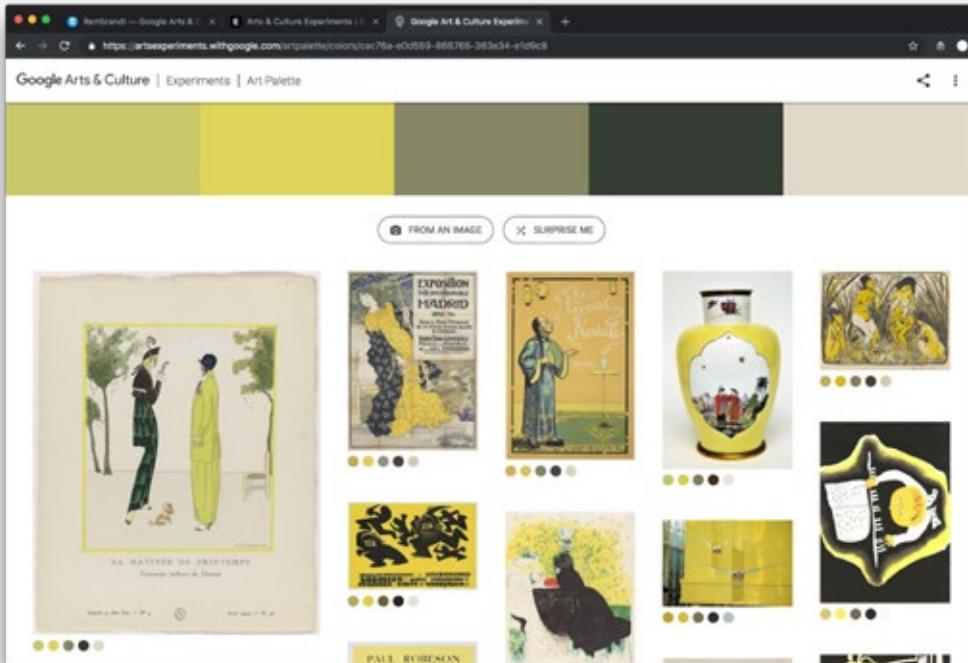
**Reference URL:** <https://artsandculture.google.com/>

**Date of screenshots:** 2018-11-20

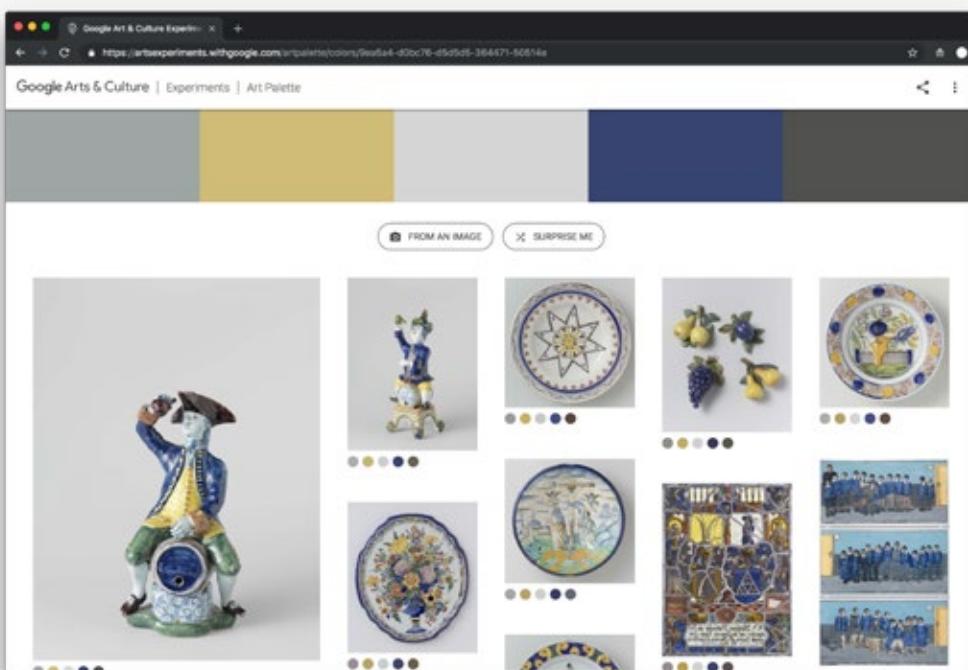
**Notes:** Google's Arts & Culture interface offers a few different ways to browse a selection from the collections based on a search term (such as an artist, a movement, a particular institution, etc). As with previous notes on the general platform, the lack of context for where the aggregated items are coming from is problematic in this seemingly "transparent" approach to presenting collection overviews and previews (See: Bolter & Gromala, 2003, for more on interface transparency).



# Google A&C Experiments: Art Palette



Example view of Art Palette 1:  
Collection overview with  
thumbnail previews organized  
by colour palette.



Example view of Art Palette 2.



Overviews & previews

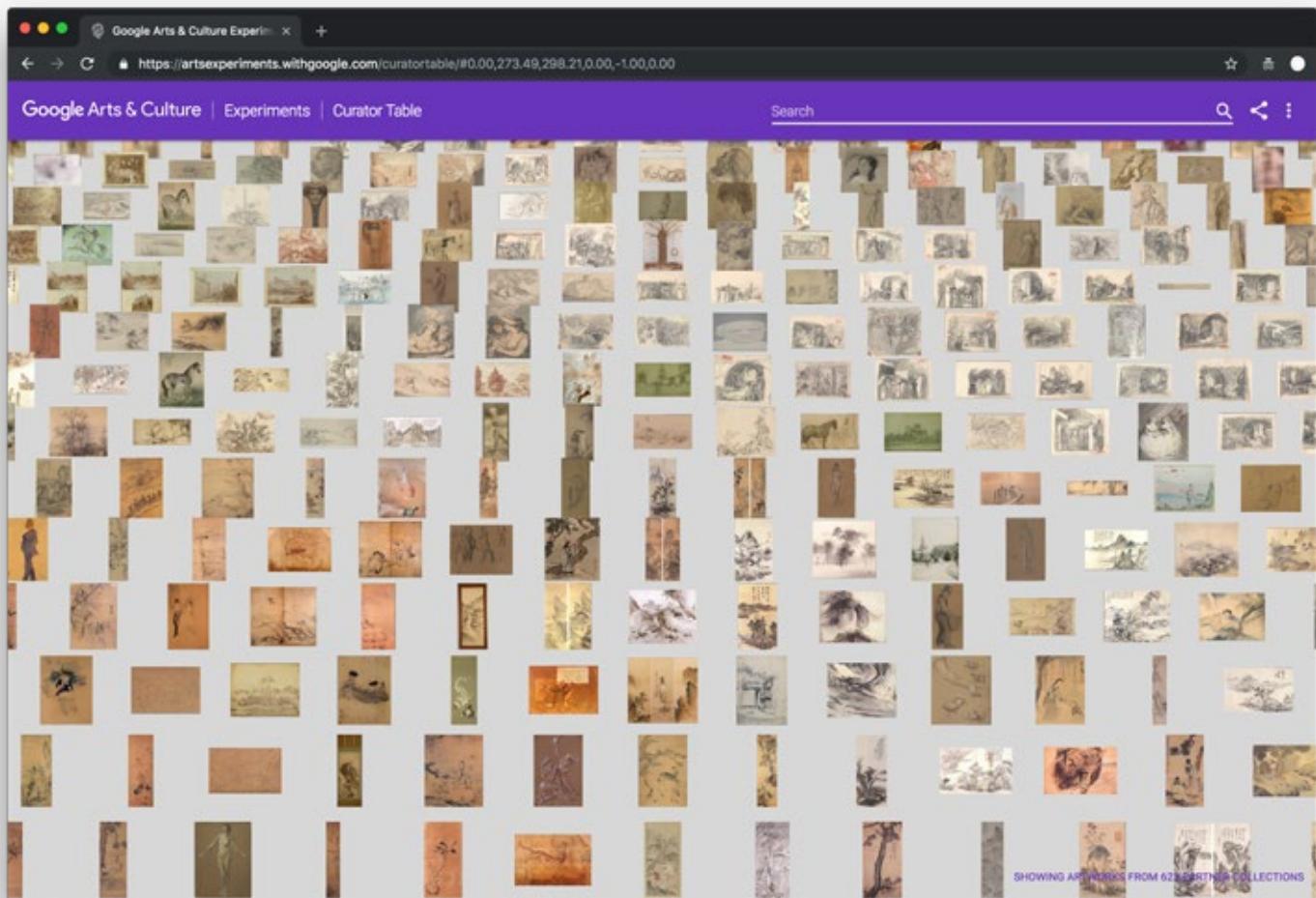


Sort by color

Reference URL: <http://act.mit.edu/cavs>

Date of screenshots: 2018-11-20

# Google A&C Experiments: Curator Table



*Example view of Curator Table 1: Collection overview with thumbnail previews presented in a 3-dimensional environment where computer vision and machine learning enable different modes for organizing and structuring collection items.*

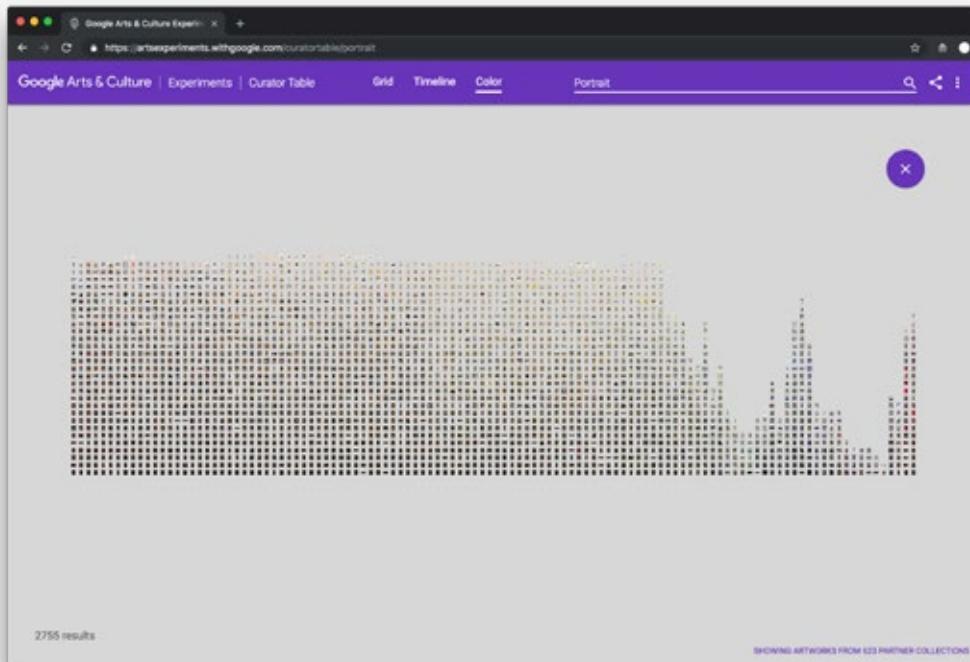


Generous interfaces

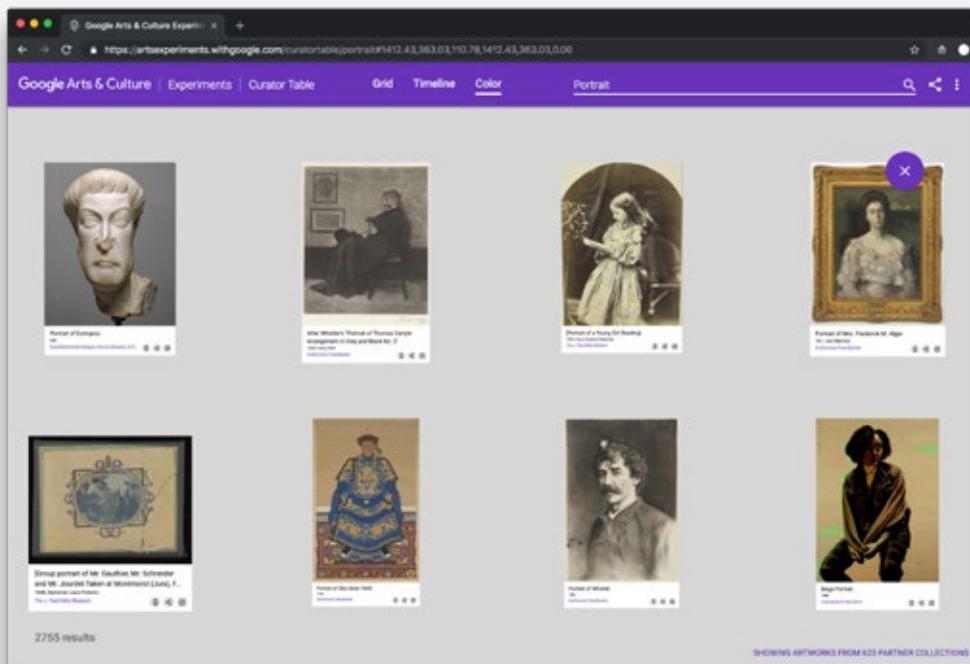
**Reference URL:** <https://artsexperiments.withgoogle.com/curatortable/>

**Date of screenshots:** 2018-11-20

# Google A&C Experiments: Curator Table (cont.)



Example view of Curator Table 2: Collection overview can be narrowed down by search terms and organized by color similarities.

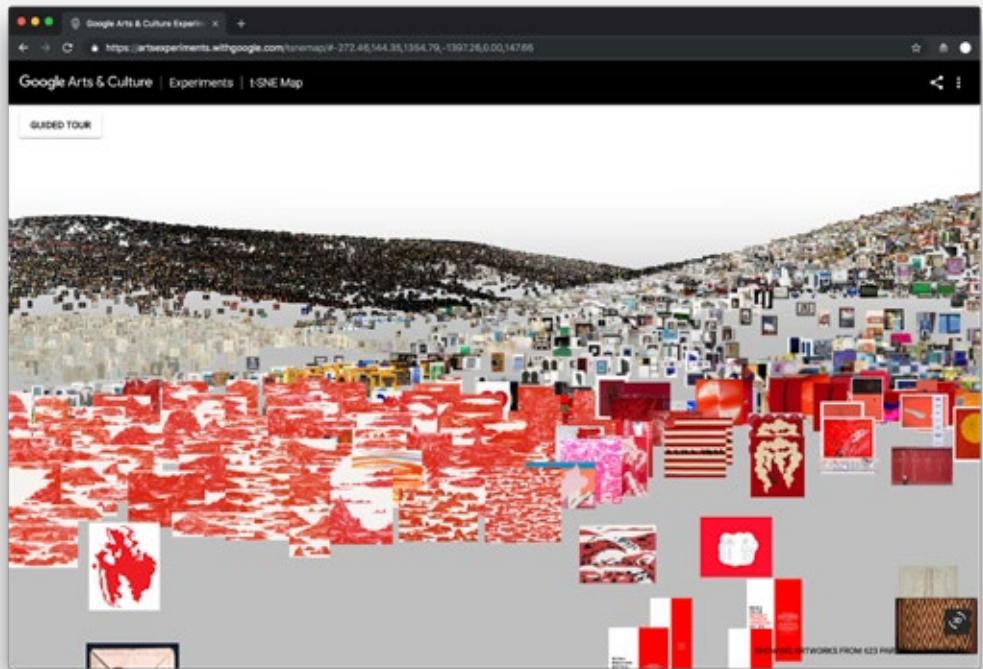


Example view of Curator Table 3: Zoomed-in view with thumbnail previews provides some contextual information.

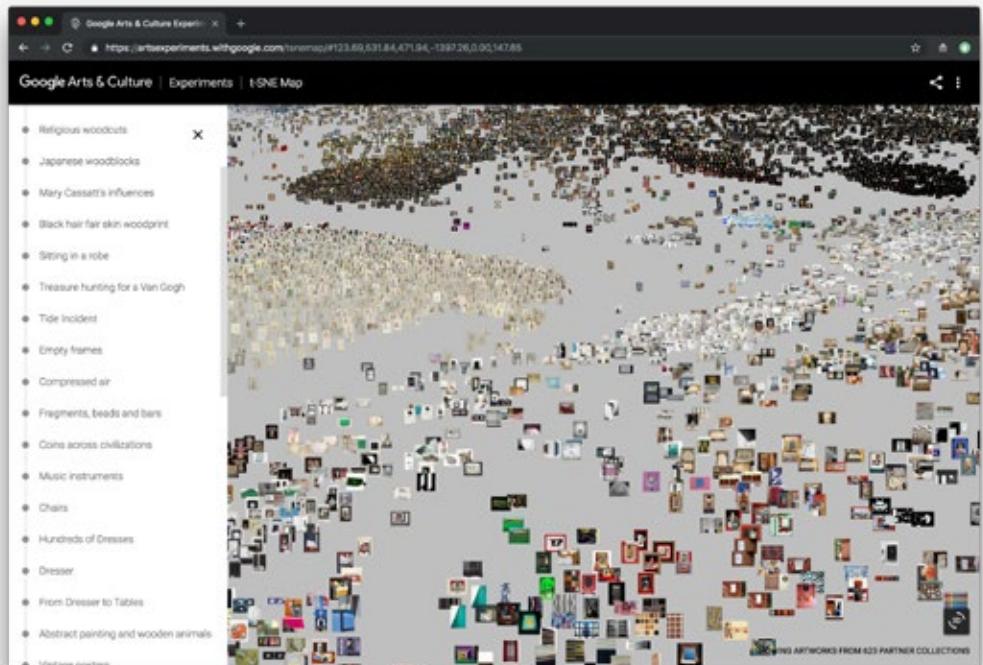
- ★  
**Overviews & previews**
- ★  
**Sort by color**
- ★  
**Multi-object timeline**

# Google A&C Experiments: t-SNE Map

Example view of t-SNE Map 1: Collection overview with thumbnail previews is mapped on a 3-dimensional landscape.



Example view of t-SNE Map 2: Suggested “points of interest” can be used to traverse the collection in a guided route.



★  
**Generous interfaces**

★  
**Overviews & previews**

★  
**Sort by color**

**Reference URL:** <https://artsexperiments.withgoogle.com/tsnemap/>

**Date of screenshots:** 2018-11-20

**Notes:** Built similarly to the Curator's table experiment, this interface replaces the grid view with a “landscape” generated through a mix of algorithmic approaches to data visualization. While an engaging way to browse the collection, similarly to the other experiments, this type of interface can only work for artworks which can be clearly represented by a single digital image. Again, any form of context and even a sense of scale are missing from this experience.



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## 5 Interfaces for linked data cultural projects

# British Museum – Research space (UK)

The screenshot shows the homepage of the British Museum ResearchSpace. On the left, there's a sidebar with 'Getting Started' (Explore ResearchSpace features, Take a guided tour of search) and 'Example Searches' (Actor Search). The main area features a search interface with a facet menu on the right containing categories like Thing, Actor, Place, Time, Event, and Concept. The footer includes links to The British Museum, Mellon Foundation, About ResearchSpace, Terms of Use, and Acknowledgements.

This screenshot shows a search interface within the ResearchSpace platform. A facet menu on the right lists categories: Thing, Actor, Place, Time, Event, Concept, and a text search input. The 'Actor' category is currently selected. The footer is identical to the first screenshot, featuring links to The British Museum, Mellon Foundation, About ResearchSpace, Terms of Use, and Acknowledgements.



ResearchSpace beta

Secure | https://public.researchspace.org/resource/?uri=http%3A%2F%2Fcollection.britishmuseum.org%2Fid%2Fobject%2FYCA62958

Example Records ▾ Login ⚙

Home / The Rosetta Stone, granodiorite, Ptolemaic (.24)

 The Rosetta Stone, granodiorite, Ptolemaic (.24) ● Object (Man-Made Object) record, British Museum

Summary Annotations Explore Related

Field	Value	Annotations	Assertions
Title	The Rosetta Stone, granodiorite, Ptolemaic (.24)	0	0
Description	Part of grey and pink granodiorite stela bearing priestly decree concerning Ptolemy V in three blocks of text: Hieroglyphic (14 lines), Demotic (32 lines) and Greek (54 lines).	0	0
Object Type	stela	0	0
Asset ID	YCA62958	0	0
Material	granodiorite (en)	0	0
Dimensions	Length: 112.3 Centimeter Thickness: 28.4 Centimeter Width: 75.7 Centimeter	0	0

Example view of an item record: Linked data statements are represented in a tabular format (as fields and values).

Reference URL: <https://public.researchspace.org>

Date of screenshots: 2018-11-22

**Notes:** This project's interface aims to reveal the capabilities of a linked data database to users unfamiliar with the LOD paradigm. Particularly strong points are the GUI for running queries on the database and the ability to add annotations / assertions to each metadata statement. This functionality is similar to the qualifiers function in Wikidata: it enables the construction of contradictory statements which can co-exist because they are given appropriate sourcing and argumentation as a "sub-statement". The underlying data model in this case follows the CIDOC-CRM specification and its argumentation extension.

# Max Planck Institute – Sphaera CorpusTracer (DE)

The screenshot shows the main interface of the Sphaera CorpusTracer application. At the top, there is a navigation bar with links for Books, Persons, Places, Terms, Search, and Login. Below the navigation bar is a search bar with placeholder text "type to search, minimum 3 symbols ...".

**Books Section:** The title "Books" is displayed, followed by the message "There are currently 320 books in the database." A button labeled "List all books" is present. Below this, a section titled "Recently edited" lists a single item: "El filosofo. Ocupacion de nobles, y discretos contra la cortesana ociosidad. Sobre los libros de cielo, y Mundo, Meteoros, Parvos Naturales, Ethica, Economic, Politica de Aristoteles, y Esfera de Sacro Bosco. Epitome claro, y curioso. Tratanse estas materias con rigor escolastico: y dividense en dos libros, Filosofia Natural, y Filosofia Moral. Por el licenciado Cosme Gomez Texada de los Reyes, Capellan mayor de las Bernardas Descalzas, y Patronazgo en S. Ildefonso de Talavera. Al licenciado Frey Martin Rodriguez de Corrales, del Abito de San Juan, Prior de San Christoval de Salamanca, y Vicario

**Persons Section:** The title "Persons" is displayed, followed by the message "There are currently 342 persons in the database." A button labeled "List all persons" is present. Below this, a section titled "Recently edited" lists two items:

- Name: Jacques Quesnel, with a "View" button.
- Name: Richard Watkins, with a "View" button.

*Entry point to the collection: A collection overview is provided based on two primary record types – books and persons.*

The screenshot shows the search interface of the Sphaera CorpusTracer application. At the top, there is a navigation bar with links for Books, Persons, Places, Terms, Search, and Login. Below the navigation bar is a breadcrumb trail showing "Home / Search".

The main area features a search input field with placeholder text "... related to" and a dropdown menu. The dropdown menu contains four items: "Person" (represented by a person icon), "Place" (represented by a location pin icon), "Timeframe" (represented by a clock icon), and "Language" (represented by a speech bubble icon). There is also a "cancel" button at the bottom right of the dropdown.

CorpusTracer is based on Metaphactory and ResearchSpace. It has been developed within The Sphere project at the Max Planck Institute for the History of Science.

*Search interface view: This interface is an application of the SPARQL query GUI of Research Space.*

**Linked data**

**SPARQL query GUI**

**Links to related queries**

*Example view of an item record: A natural language summary of the structured data is featured alongside an image pulled from Wikimedia Commons via Wikidata.*

The screenshot shows a web browser window for the Sphaera CorpusTracer application. The URL is db.sphaera.mpiwg-berlin.mpg.de/resource/?personId=http://db.sphaera.mpiwg-berlin.mpg.de/N2Fch%2Fperson%2F8b4f7966-2da2-46c1-a182-2b8... . The page title is "Sphaera CorpusTracer". The main content area displays a summary of a person named "Hans Lufft", described as a "Printer". Below the summary is a detailed description of his life and activities, mentioning his birth around 1495, death around 1584, and his role as a printer in Wittenberg. A small portrait of Hans Lufft is displayed, showing him with a beard and a turban-like hat. A "Give Feedback" button is visible in the top right corner.

*Example view of an item record: More metadata statements are presented further down on the page.*

The screenshot shows a detailed view of a person record in the Sphaera CorpusTracer. The URL is db.sphaera.mpiwg-berlin.mpg.de/resource/?personId=http://db.sphaera.mpiwg-berlin.mpg.de/N2Fch%2Fperson%2F8b4f7966-2da2-46c1-a182-2b8... . The page title is "Sphaera CorpusTracer". The main content area displays a detailed summary of a person named "JOHANNES LUFFT", described as a "Typographus, Bibliopolis, et...". Below the summary are sections for "Other Names", "Books published and printed", "External Links", and "Identifier". The "Books published and printed" section lists a single entry: "Elementa doctrinae de circuitu coelostitutu, & primo motu" (Full Title) with the year 1563. The "External Links" section includes links to Wikidata and Thesaurus. The "Identifier" section provides a direct link to the record.

**Reference URL:** <http://db.sphaera.mpiwg-berlin.mpg.de/resource/Start>

**Date of screenshots:** 2018-11-15

**Notes:** This project builds upon the Research Space platform with some adaptation to fit the context of the collection. The data model used is CIDOC-CRM with the bibliographic extension FRBRoo. The search GUI, relevant pre-set queries, natural language summaries, and even federation with other open datasets (i.e. Wikidata) demonstrate the benefits of linked data for cultural heritage projects at large.



Natural language  
summary generated  
from structured data



# Wikidata / Wikibase default interface

Douglas Adams (Q42)

British author and humorist (1952–2001)  
Douglas Noel Adams | Douglas N. Adams

Language Label Description Also known as

English	Douglas Adams	British author and humorist (1952–2001)	Douglas Noel Adams Douglas N. Adams Douglas Adams
French	Douglas Adams	écrivain anglais de science-fiction	Douglas Noel Adams Douglas N. Adams
German	Douglas Adams	britischer Schriftsteller (1952–2001)	Douglas Noel Adams Douglas N. Adams
Scots	Douglas Adams	No description defined	Douglas Noel Adams

All entered languages

Statements

Instance of: human

2 references stated in Virtual International Authority File  
VIAF ID 113230702  
retrieved 7 December 2013

stated in BNF authorities  
retrieved 10 October 2013  
reference URL <http://data.bnf.fr/ark:/12148/cb11888090>

Image: 

Douglas adams portrait cropped.jpg  
303 x 396; 32 KB

country of citizenship: United Kingdom

1 reference stated in Virtual International Authority File  
VIAF ID 113230702  
retrieved 7 December 2013

name in native language: Douglas Adams (English)

0 references

birth name: Douglas Noel Adams (British English)

1 reference title Obituary: Douglas Adams (English)  
publisher The Guardian  
publication date 15 May 2001  
language of work or name English  
reference URL <http://www.theguardian.com/news/2001/may/15/guardsanddwarves.boo...>  
retrieved 7 December 2013  
author Nicholas Wise

given name: Douglas

series ordinal: 1

2 references stated in Integrated Authority File  
GND ID 119033364  
retrieved 7 July 2015

responded from Wikipedia project English Wikipedia

Mother: **Noel**

series ordinal: 2

1 reference stated in Integrated Authority File  
GND ID 119033364  
retrieved 7 July 2015

Example view of an item record 1: The item page features a text label, description, aliases, translations of the label and description, and a series of (unordered) statements.

Example view of an item record 1: This particular example is often used as a model item to showcase Wikidata capacities; the statements on the page are extremely detailed.



Linked data



Invitation to contribute

Net Art Anthology (Q28050689)

online exhibition of the history of net art

Language	Label	Description	Also known as
English	Net Art Anthology	online exhibition of the history of net art	
French	Net Art Anthology	No description defined.	
German	Net Art Anthology	No description defined.	
Scoots	No label defined	No description defined.	

All entered languages

**Statements**

instance of	online exhibition of Internet art	+ edit
	+ 0 references	+ add reference
		+ add value
	anthology	+ edit
	+ 0 references	+ add reference
		+ add value
inception	27 October 2016	+ edit
	+ 1 reference	+ add value
organizer	Rhizome	+ edit
	+ 0 references	+ add reference
		+ add value
official website	<a href="https://anthology.rhizome.org/">https://anthology.rhizome.org/</a>	+ edit
	+ 0 references	+ add reference
		+ add value

Example view of an item record 2: An item page can also have just a few statements; there are no min or max metadata requirements.

**Reference URL:** <https://www.wikidata.org/>

**Date of screenshots:** 2018-11-22

**Notes:** The default Wikidata (Wikibase) interface is included here as a point of comparison with other interfaces which have been developed to pull data from Wikidata and present it in alternative ways. While this default interface is primarily intended for machine-reading (rather than human usability), it still sets out some useful paradigms, such as the fact that both properties and items within statements are clickable – thereby enabling horizontal browsing (and also discovery of what these statements mean). As mentioned already in relation to Research Space, Wikidata also allows contradictory statements, these are differentiated via qualifiers. How such contradictions are made visible to users could be made more explicit in the design.



## Wikimedia Labs – Reasonator

*Example view of a an item record 1: Statements are presented in customized clusters and collapsible elements.*



The screenshot shows a web browser window for the Reasonator tool at <https://tools.wmflabs.org/reasonator/?&q=42>. The main content area displays a timeline for Douglas Adams, starting from 1973 and ending in 1991. Key events include his nomination for the Hugo Award for Best Dramatic Presentation in 1973, his education at St John's College, and his nomination for the Locus Award for Best Science Fiction Novel in 1983. The timeline also shows his marriage to Polly Jane Rocket Adams in 1986. Below the timeline, there is a section titled "Related media" featuring various images related to Douglas Adams, such as a portrait, a car, and book covers for "The Meaning of Lef" and "42". A QR code is visible on the right side of the page.

*Example view of an item record 1: A timeline of events connected to the item and other related media are featured further down on the page.*



**Single-object timeline**



**Open source**

**Reference URL:** <https://tools.wmflabs.org/reasonator/>

**Date of screenshots:** 2018-11-22

**Notes:** This experimental interface, aiming to make Wikidata “pretty”, implements a number of approaches towards making Wikidata statements more “human-readable”. For a small number of record types (i.e. person, place, species, etc) the templates are customized to present data in hierarchical clusters (and even short natural language summaries)... (cont.)

## Wikimedia Labs – Reasonator (cont.)

The screenshot shows a web browser window for the 'Net Art Anthology - Reasonator' page at <https://tools.wmflabs.org/reasonator/?&q=28050689>. The page displays detailed information about the item, organized into sections:

- Net Art Anthology (Q28050689)**: The main title and subject of the record.
- online exhibition of the history of net art**: A brief description of the item's nature.
- Other properties**: A section containing key statements:
  - instance of**: online exhibition exhibition whose venue is cyberspace of: Internet
  - anthology**: anthology collection of creative works chosen by the compiler
  - inception**: 2016-10-27
  - organizer**: Rhizome Born-digital nonprofit organization supporting digital art and culture
- From related items**: A list of other items from the same category:
  - A Cyberfeminist Manifesto for the 21st Century art project point in time : 2016-10-27
  - Raabracadabra visual poem by Eduardo Kao point in time : 2016-11-03
  - My Boyfriend Came Back From The War Internet artwork by Ola Latina point in time : 2016-11-10
  - The File Room artwork by Antoni Muntadas point in time : 2016-11-17
  - FloodNet art project by Electronic Disturbance Theater point in time : 2016-12-01
  - Mouchelette.org internet artwork by Martine Nederlof point in time : 2016-12-06
  - Mezzangello artificial language and art project by Miz Breeze point in time : 2016-12-15
  - Form\_Art internet artwork and art genre by Alexei Shugin point in time : 2017-01-12
  - BIT Plane art project by Bureau of Inverse Technology (BIT) point in time : 2017-01-19
  - Heritage Gold art project by Mongrel point in time : 2017-01-26
  - Blacklash video game mod and artwork by Mongrel point in time : 2017-02-03
  - The Dalle Clone Series artwork by Lynn Hershman Leeson point in time : 2017-02-09
  - The Web Stalker internet artwork by VGD point in time : 2017-02-16
  - LOVE internet artwork by Group Z point in time : 2017-02-22
  - Documenta Done internet artwork by Vuk Čosić point in time : 2017-03-03
- Free images Google search**: A link to search for images related to the item.
- External sites**: A dropdown menu showing 'External sites' and 'official website'.
- Wikimedia projects**: A dropdown menu showing 'Wikimedia projects'.
- Concept cloud**: A small graphic element representing the semantic relationships between the item and other entities.

*Example view of a an item record 2: Statements are presented in customized clusters and collapsible elements, notably “related items”.*

The screenshot shows a web browser window for 'Net Art Anthology - Reasonator'. The URL is <https://tools.wmflabs.org/reasonator/?&q=28050689>. The main content area displays a list of artworks with their descriptions and point-in-time qualifiers:

- Blacklash video game mod and artwork by Mongrel  
point in time: 2017-02-03
- The Dollie Clone Series artwork by Lynn Hershman Leeson  
point in time: 2017-02-09
- The Web Stalker Internet artwork by I/O/D  
point in time: 2017-02-16
- LOVE Internet artwork by Group Z  
point in time: 2017-02-22
- Documents Done Internet artwork by Vuk Čosić  
point in time: 2017-03-02
- Female Extension Internet artwork by Cornelia Sollfrank  
point in time: 2017-03-08
- Bodies© INCorporated Internet artwork by Victoria Vesna  
point in time: 2017-03-17
- Automatic Rain Internet artwork by JODI  
point in time: 2017-03-24

Below this is a 'Timeline' section for the exhibition history of BIT Plane:

Start Date	End Date	Exhibition Name
JANUARY 12, 2017	JANUARY 19, 2017	exhibition history: BIT Plane
JANUARY 19, 2017		art project by Bureau of Inverse Technology (BIT)
JANUARY 20, 2017	JANUARY 26, 2017	exhibition history: Heritage Gold

At the bottom, there is a 'Related media' section featuring a thumbnail of a person speaking at a podium.

*Example view of a an item record 2: A timeline features the related items, via the point-in-time qualifier on the “related” statement.*

**Notes (cont.):** For the regular records (e.g. the exhibition example above), the statements tend to be lumped under “other properties”, but a very useful feature is the cluster of “related items”, which is pulled via a SPARQL query. This feature could be extremely useful in the general Wikidata interface as well, because it enriches all item records without the need to create inverse properties. For example, the page for the NAA exhibition in Wikidata features few statements. However, the same page in Reasonator is a lot richer, because it pulls in all artworks which have the property “exhibition history” with value “NAA exhibition”. This information can then also be rendered in a timeline visualization.

# Wikidata for Digital Preservation portal

Netscape (Q3297609)

Current Data About Netscape

instance of (P31) software (Q7397) Imported from Wikimedia project (P143) English Wikipedia

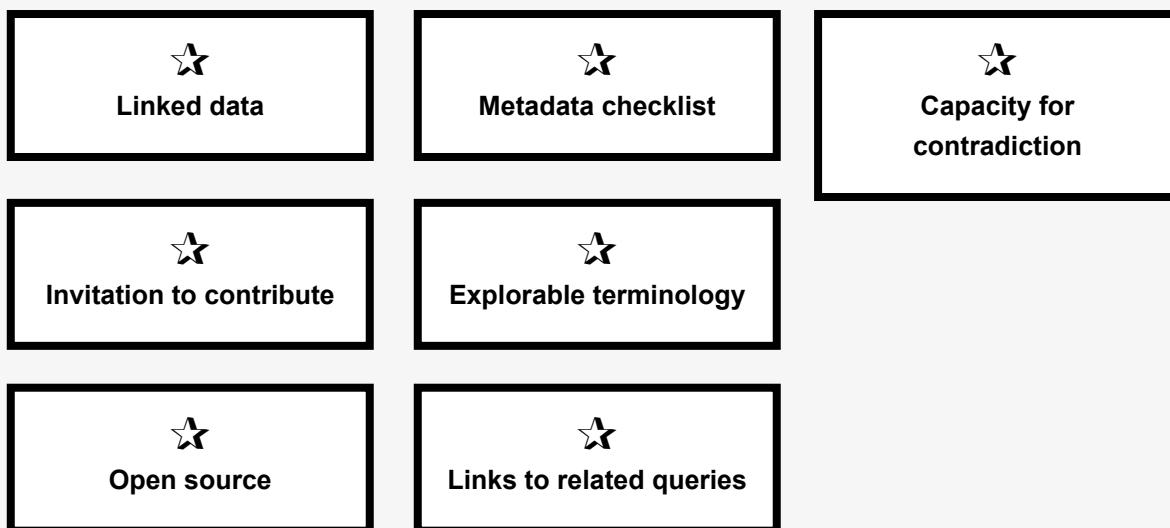
developer (P178) AOL (Q27585) Imported from Wikimedia project (P143) English Wikipedia

sub class of (P279) Netscape Navigator (Q235419)

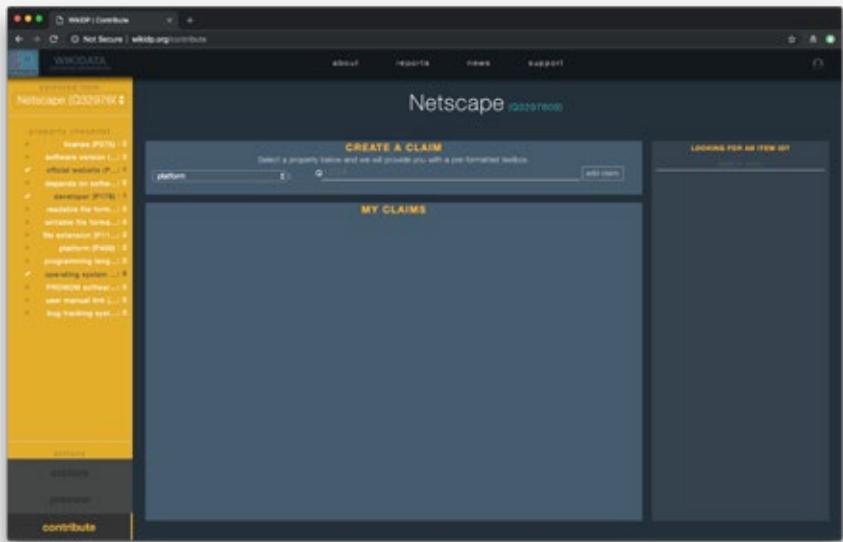
Windows 98 (Q483132)  
reference URL (P854) http://sillydog.org/netscape/verinfo.php  
retrieved (P813) Friday, July 21, 2017

Windows NT 4.0 (Q468978)

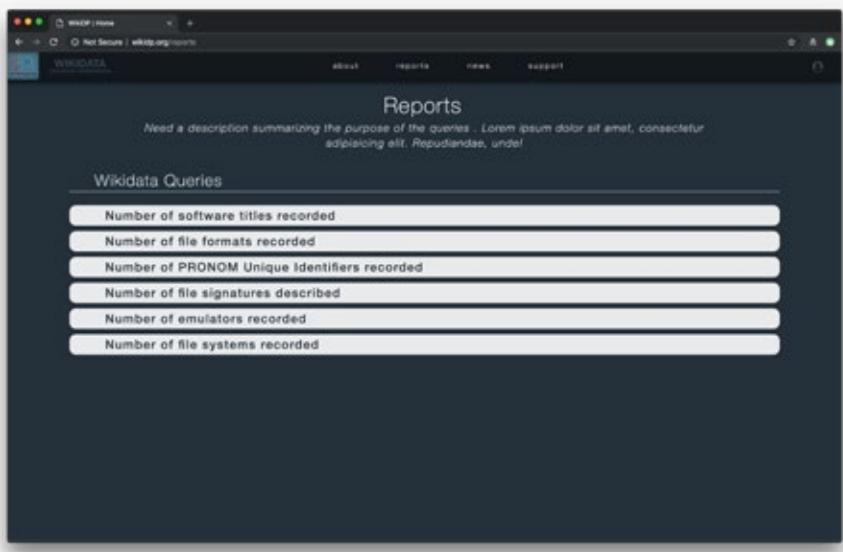
Example view of an item record: Statements are pulled from Wikidata and presented in a custom-styled interface.



*Example view of an item record: There is an option to contribute data directly within the portal via a form to create claims.*



*Exploratory options: The portal features some links to pre-set Wikidata queries of common interest.*



---

**Reference URL:** <https://artsandculture.google.com/>

**Date of screenshots:** 2018-11-20

**Notes:** The Wikidata for Digital Preservation portal is a Python-based interface pulling data from Wikidata, but unlike Reasonator, which functions as an overlay to the entire Wikidata database, this portal is specific to data regarding software items and file formats. Record pages feature a checklist in a sidebar panel, which is designed to encourage contributions by exposing (explicitly) what metadata is recommended to be there, but is currently missing. Contributing data is made easier (compared to other interfaces such as Reasonator), by providing a quick-to-fill-out form right within the portal, without the need to log-in or even go to Wikidata. But on the record-page level, the interface doesn't fundamentally change the interaction paradigms of Wikidata's generic interface. Metadata is presented without any particular hierarchy or clustering. Finally, the portal also features links to pre-set Wikidata queries of common interest. This is a useful feature, which could be utilized more in other linked data interfaces as a way to encourage exploration and/or avoid the need for a SPARQL GUI.

# Science Stories

The screenshot shows a web browser window with the URL [www.sciencestories.io/0/16/1](http://www.sciencestories.io/0/16/1). The page title is "Grace Hopper - Story | Science Stories". On the left, a sidebar menu lists various topics: Introduction, The college years, Hopper at Work, Book: The First Glossary of Programming Terminology, Drawing: The Family Tree of Computers, Image: Smithsonian Institution, Video: Grace Hopper at MIT, Education of Grace Hopper, Timeline of Grace Hopper, People Relevant to Grace Hopper, Map: Grace Hopper, and Library of Grace Hopper. The main content area features a large black and white photograph of Grace Murray Hopper, a woman with glasses and a military-style uniform, standing in front of a computer console. Below the photo is the title "Grace Murray Hopper". A text block provides a brief biography: "Grace Brewster Murray Hopper (née Murray; December 9, 1906 – January 1, 1992) was an American computer scientist and United States Navy rear admiral. One of the first programmers of the Harvard Mark I computer, she was a pioneer of computer programming who invented one of the first compiler related tools. She popularized the idea of machine-independent programming languages, which led to the development of COBOL, an early high-level programming language still in use today." At the bottom of the page is a pink footer bar with a downward arrow icon.

Example view of a “story”,  
dedicated to a person’s  
record.

The screenshot shows a web browser window with the URL [www.sciencestories.io/0/16/182](http://www.sciencestories.io/0/16/182). The page title is "Grace Hopper - Story | Science Stories". The sidebar menu is identical to the previous screenshot. The main content area has a yellow header with the title "Grace Murray at Vassar College". Below the header, a text block states "This collection is provided by Yale University Library Manuscripts and Archives". The main content area contains two images: a portrait of Grace Murray Hopper and an image of a large, historic building, likely Vassar College. The interface uses the IIIF-compliant Mirador image viewer to display these images.

Example view of a “story”:  
The interface uses the IIIF-  
compliant Mirador image  
viewer to display images from  
open collections.



Linked data

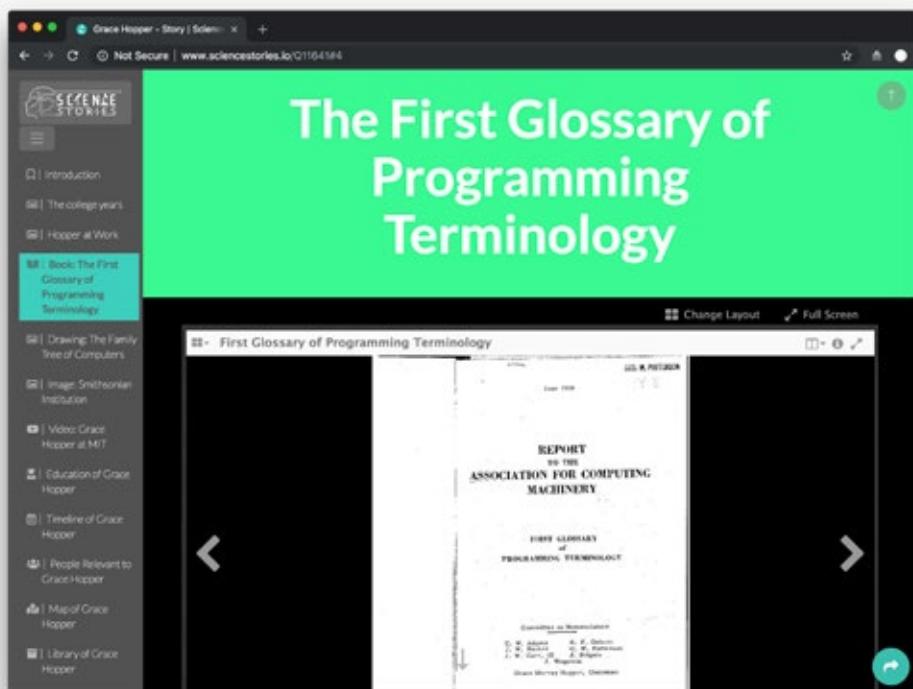


Explorable terminology



Single-object timeline

*Example view of a “story”: The Mirador viewer can be used to display other media objects, too, such as books or videos.*



*Example view of a “story”: A customized timeline view is rendered based on statements contained in the Wikidata record page.*



Open source

Reference URL: <http://www.sciencestories.io/>

Date of screenshots: 2018-11-16

**Notes:** This project re-imagines how linked data and media found in open collections can be combined to tell “stories” about people, in this case focusing on women in science. It demonstrates a few different approaches to displaying data from Wikidata and Wikimedia Commons, including a timeline, a media viewer, and a custom view of Wikidata statements.

# Science Stories (cont.)

The screenshot shows a web browser window with the URL [www.sciencestories.io/Q11641914](http://www.sciencestories.io/Q11641914). The page title is "Grace Hopper - Story | Science Stories". On the left, there's a sidebar with links like "Book The First Glossary of Programming Terminology", "Drawing The Family Tree of Computers", etc. The main content area is titled "Wikidata" and shows a search bar with "Search Wikidata". Below it is a "Wikidata" logo and the name "Grace Hopper (Q11641)". A brief description follows: "American computer scientist and United States Navy officer Grace Murray Hopper | Grace M. Hopper". A "Contents" section includes "Statements", "Identifiers", and "Sitelinks". The "Statements" section lists: "instance of Human" (with a reference to the Defense Distinguished Service Medal), "imported from Wikimedia project Russian Wikipedia", and an "image" of Grace Hopper in military uniform.

Example view of a “story”: The interface also features a customized view of the Wikidata record page.

This screenshot shows the same web browser window with the same URL. The main content area now displays a more detailed list of statements for Grace Hopper. It includes: "name in native language" (Grace Murray Hopper (English)), "given name" (Grace), "family name" (Hopper), "date of birth" (9 December 1906 Gregorian), "place of birth" (New York City), "Computer Society", "Presidential Medal of Freedom", "Computer History Museum fellow", "Wilbur Cross Medal", "World War II Victory Medal", "W. Wallace McDowell Award", "Meritorious Service Medal", and "National Defense Service Medal". Each statement includes a small description, a reference URL, and a date retrieved.

**Notes (cont.):** Similar to the previous portal interface, however, this one does not fundamentally re-design how Wikidata statements are presented to users. The overall “flow” of the story is highly structured and works well for only one type of record – person’s records. Utilizing a similar approach to an artwork-type record, is not impossible, but will have to be applied in a more flexible manner in order to work with heterogeneous types of works.

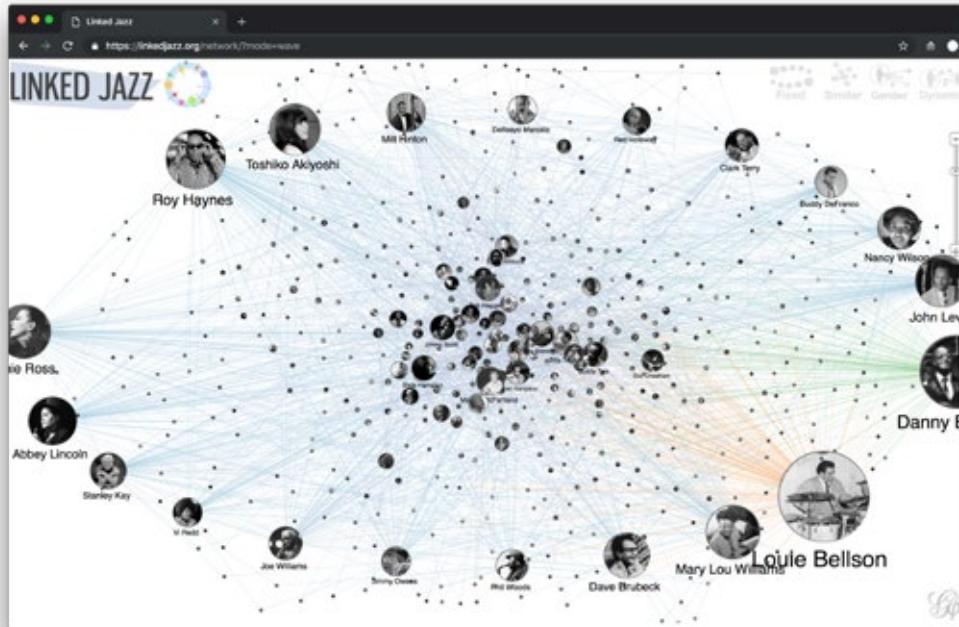




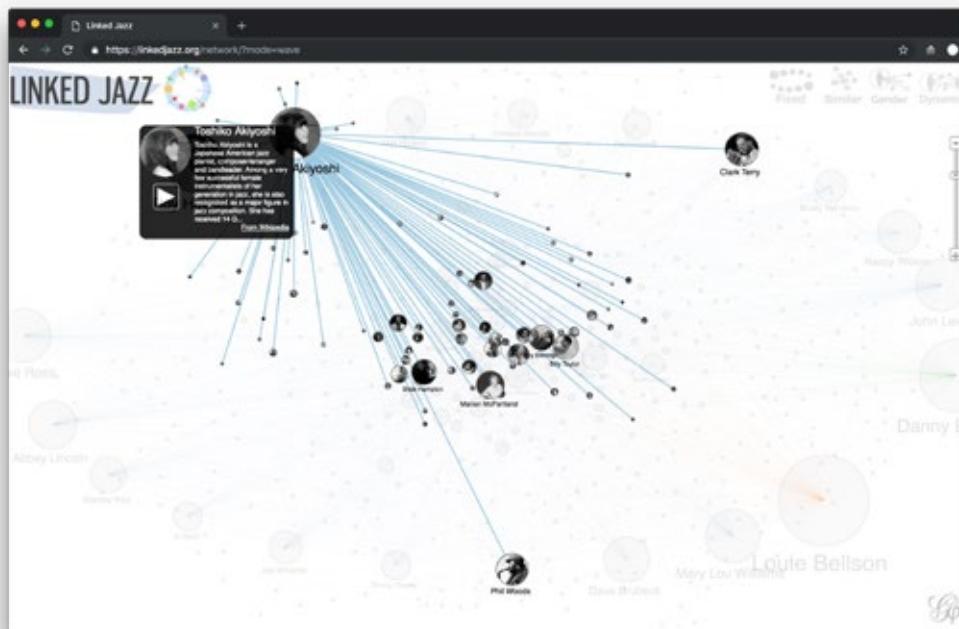
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## 6 Interfaces utilizing data visualizations to express relationships in collections

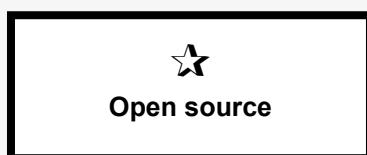
## Pratt Institute – Linked Jazz (US)



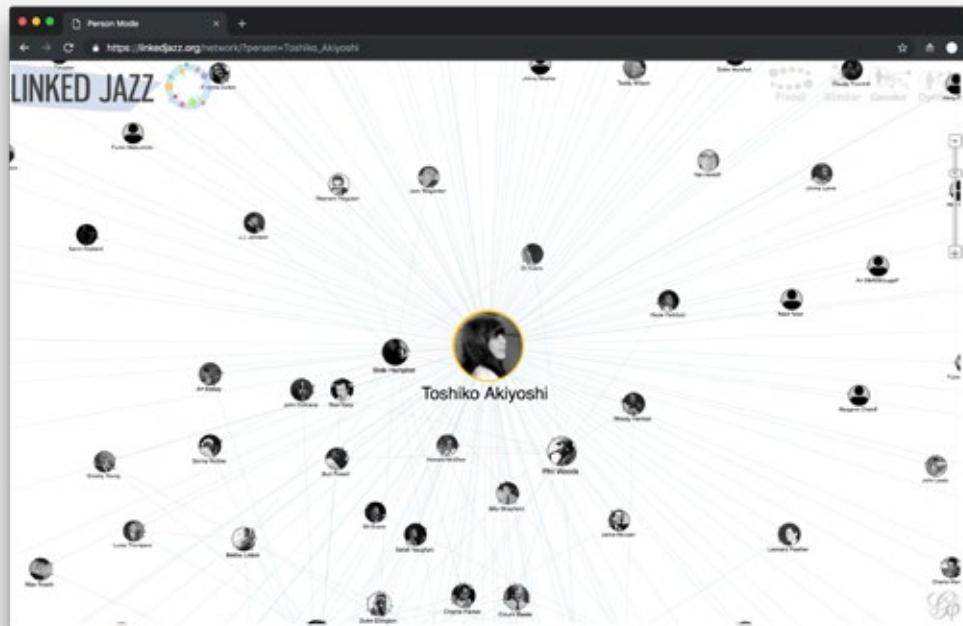
Example collection overview:  
A network diagram traces the  
relations between actors in  
the data set.



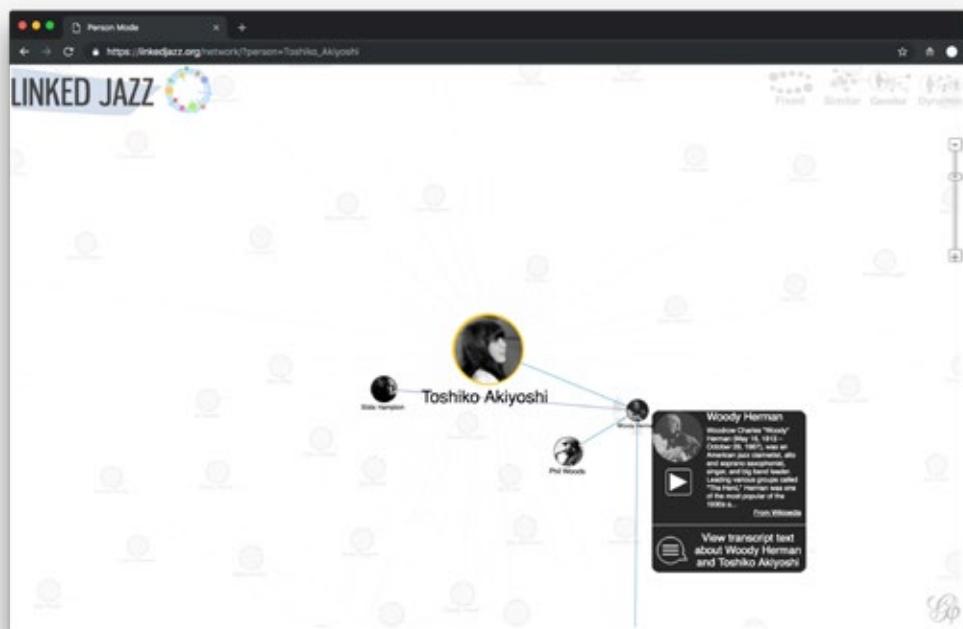
Example collection overview:  
Hovering over diagram nodes  
narrows down the view of  
possible relations.



*Example collection overview:  
Clicking on diagram nodes,  
re-centers the node and  
draws out relevant relations.*



*Example collection overview:  
Hovering over diagram nodes  
in this ‘filtered’ state narrows  
down the view even further,  
plus features a ‘preview’ data  
box for the relevant node.*



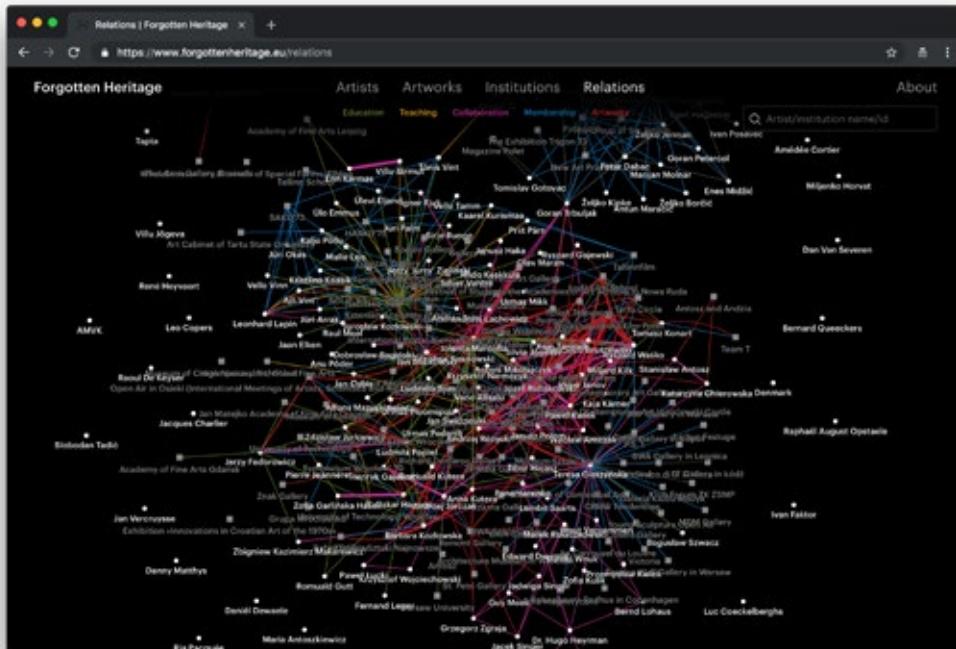
**Reference URL:** <https://linkedjazz.org>

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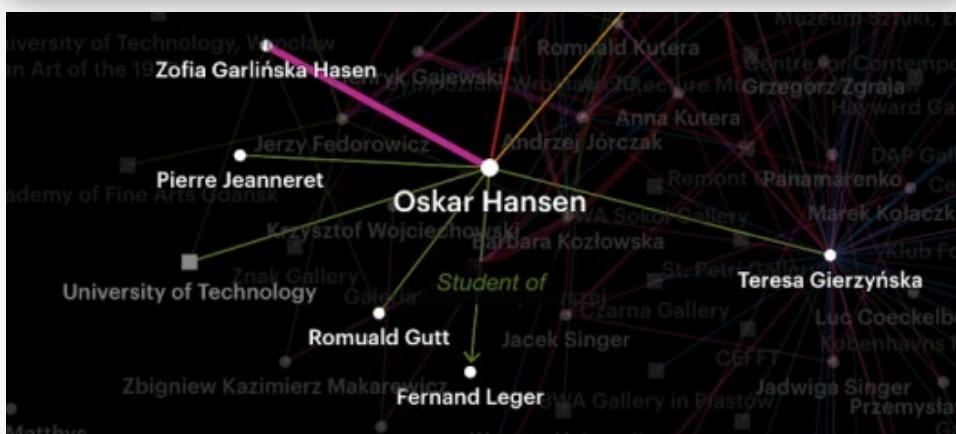
**Date of screenshots:** 2018-11-16

**Notes:** This project from the Semantic Media Lab at Pratt features a few different interfaces connected to their Linked Jazz linked data dataset. This particular project uses [d3.js](#) libraries to visualize the relations between the artists (or actors in the network of relations) in the data set. The interface gives a good overview of who may have some form of relation to whom, but as with most other network diagrams reviewed here, it remains somewhat opaque as to what exactly is the nature of the relationship: this is sometimes due to the lack of more detailed data in the data model, or it may simply be a limitation of the visual design.

# Forgotten Heritage (EU)



Example collection overview:  
A network diagram traces the  
relations between actors in  
the data set.



Example collection overview:  
A zoomed-in view of the sub-  
set of relations which gets  
highlighted once an “actor”  
node is clicked.

Reference URL: <https://www.forgottenheritage.eu/relations>

Date of screenshots: 2018-11-23

**Notes:** This is a joint project collecting archival information relating to Avant-Garde (mostly Eastern-)European artists among several art institutions in Europe. The project presents the data in different visualization styles, e.g. timelines and network diagrams. While at first the amount of information in the diagram makes it unreadable, there are different filters that can ‘sort’ the relations. Searching for a specific name also zooms in on just a few relations connected to that name, as does clicking on any node in the diagram. Within this zoomed-in view the ‘property’ of the relation becomes readable on mouse-over. While this is a visually sophisticated interface designed to a higher standard than most other prototypes or experimental projects reviewed here, its underlying structure is opaque – there is no information on the website about the database or the data model used. In addition, the project does not appear to be open source, making it harder to evaluate in terms of potential interoperability and usefulness as a reference point for the Artbase.

Linked data

Network diagram

Expression of relations

**NYPL Labs: Beta Tools (US)**

The screenshot shows the NYPL Archives & Manuscripts homepage. At the top left is the library's logo and the URL "archives.nypl.org". The main header reads "THE NEW YORK PUBLIC LIBRARY ARCHIVES & MANUSCRIPTS". On the right side, there is a search bar with the placeholder "Search names, titles, keyword" and a magnifying glass icon. Below the search bar are links for "About", "Contact", and "Digitized".

On the left side of the page, there are four buttons with icons: "+ Add Person" (person icon), "+ Add Org." (building icon), "+ Add Topic" (document icon), and "+ Add Title" (book icon). The central part of the page features a complex network graph. Nodes represent various historical documents, such as "Letter to George Washington [Mount Vernon, Va.]", "Order of United American records", and "George Washington notebook as a Virginian". Edges connect nodes based on their relationships, forming a dense web of connections. A large blue human-shaped node is positioned in the center of the graph.

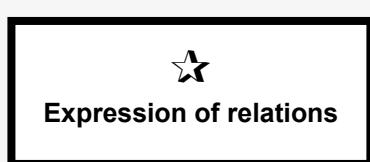
*Example collection overview: A network diagram of items in the collection related to the “term” George Washington.*



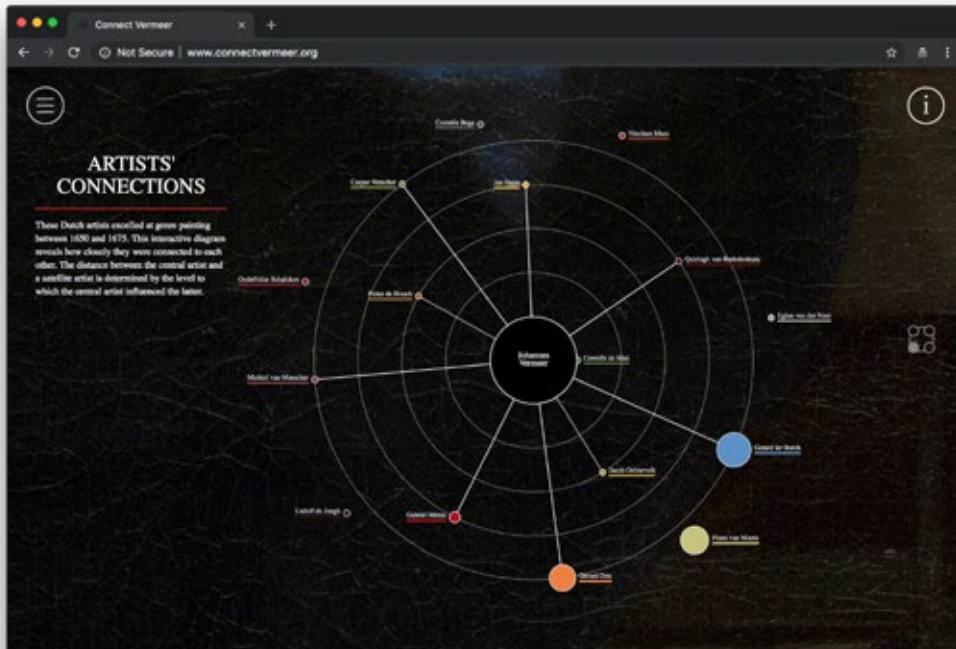
**Reference URL:** <http://archives.nypl.org/terms/#>

**Date of screenshots:** 2018-11-23

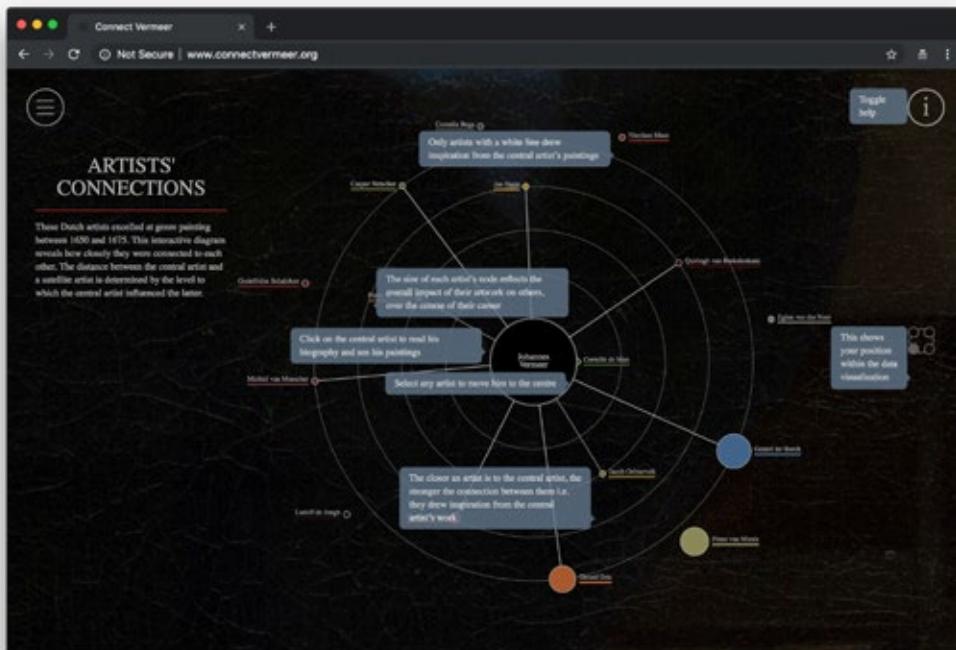
**Notes:** This interface is a beta tool developed by NYPL Labs to visualize relationships between related terms in their archives and manuscript collections. It utilizes a network diagram visualization and draws lines between different collection items identified by icons with short labels. While an interesting exploratory tool, like most other network diagrams, it obscures the nature of the relation between the items which makes it a less useful tool for expert researchers/ users who may be looking for specific types of relations.



# National Gallery of Ireland, Dublin; National Gallery of Art, Washington; Musée du Louvre, Paris – Connect Vermeer (EU/US)



Example collection overview:  
Data visualization presenting  
relations among actors in the  
data set.



Example collection overview:  
Data visualization presenting  
relations among actors in the  
data set with an overlay of  
explanatory text.



Linked data

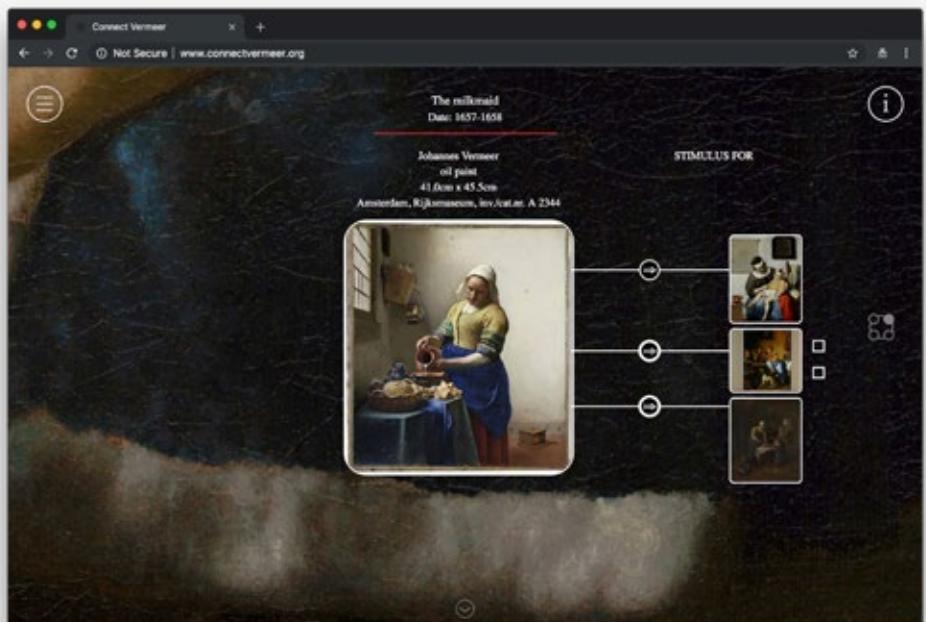


Data viz

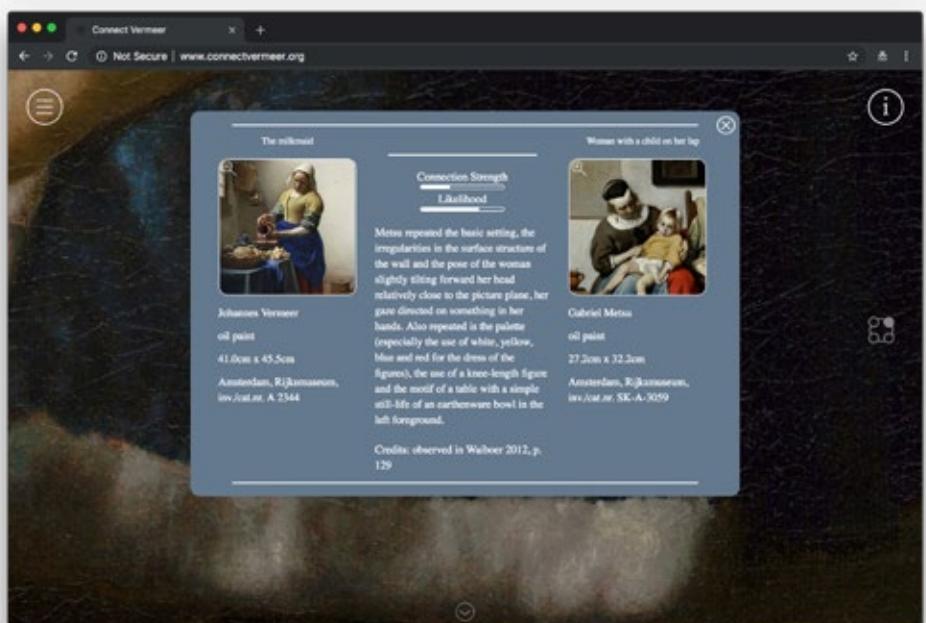


Expression of relations

*Example view of an item record: Each artwork item is presented within a diagram of connections to other artworks it has influenced or has been influenced by.*



*Example view of an item record: An explanatory overlay provides further information about the nature of the relationship between two artworks.*



**Reference URL:** <http://www.connectvermeer.org/>

**Date of screenshots:** 2018-11-23

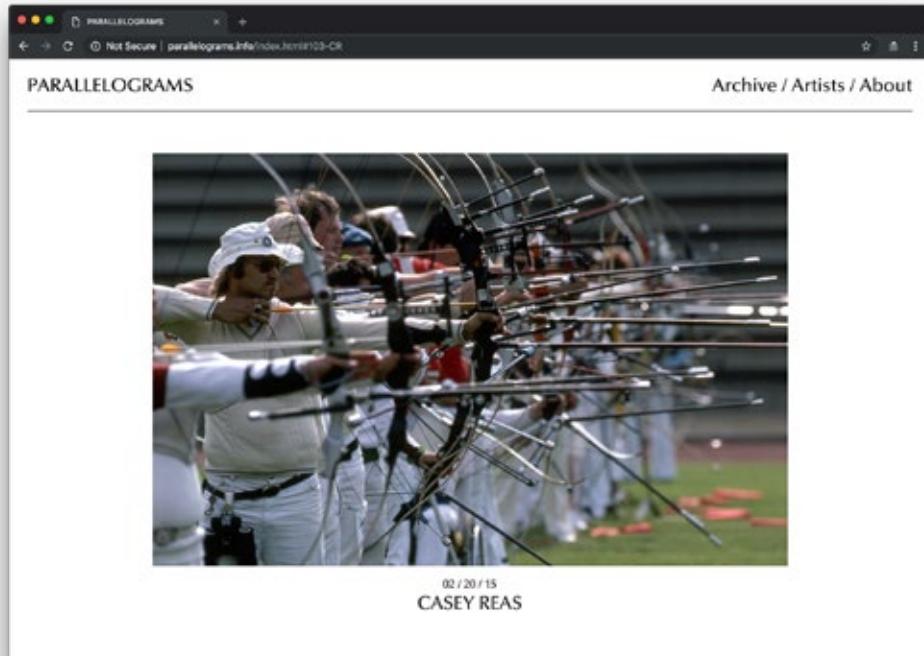
**Notes:** This joint project between three art institutions brings together research within a common linked data framework (using the CIDOC-CRM standard). While the visualization relating to artists remains mostly opaque (despite the explanation overlay text), the relations between artworks are clearly visualized and articulated further through a combination of qualitative historical argumentation and quantitative methods of analysis. Opting out of the more traditional approach of the network graph diagram, this interface aims to make relationships between items in the data set more explicit. Yet a lot of the backend data modelling remains opaque, thus limiting the usefulness of the interface to expert users.



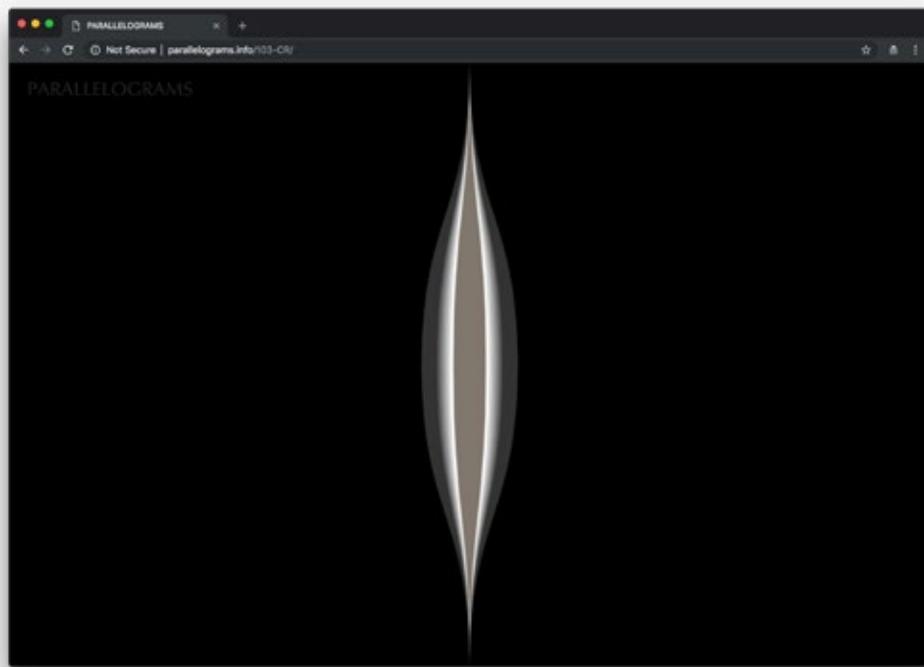
---

## 7 Interfaces for net art exhibitions

# Parallelograms (2010-2015)



*Landing view of the exhibition:  
The site can be navigated via  
a long-scroll illustrated list of  
artworks, displaying the most  
recent first, or via an Archive  
page of thumbnails organised  
chronologically.*



*Example artwork view 1:  
The artwork is presented full  
screen, the only reference  
back to the exhibition index is  
the logo just visible (gray text  
upon black ground) in the top  
left corner.*



**“White cube” exhibition approach**

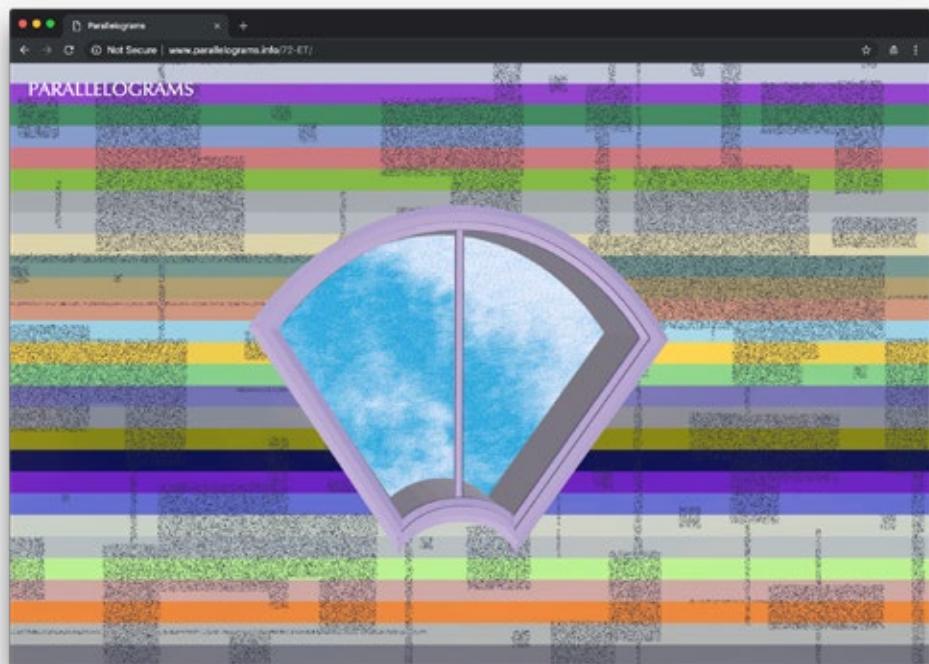


**Overviews & previews**



**Artworks hosted on exhibition site**

Example artwork view 2.



*The only contextual information provided is a list of artists' names and short biographies.*

PARALLELOGRAMS

Archive / Artists / About

**CAREY DENNISTON**  
For several years, artist Carey Denniston photographed what she argued was the same male Northern Cardinal living in her Brooklyn backyard. In late Spring of 2012, she saw two.

**CASEY REAS**  
Casey Reas' software, prints, and installations have been featured in solo and group exhibitions at museums and galleries around the world. He lives and works in Los Angeles.

**CATHERINE CZACKI**  
Catherine Czacki is an artist living and working in San Diego. She has a BFA from the San Francisco Art Institute and an MFA from Columbia University, and has traveled to Poland on a research grant at the University of Warsaw.

**Reference URL:** <http://parallelograms.info/>

**Date of screenshots:** 2018-11-25

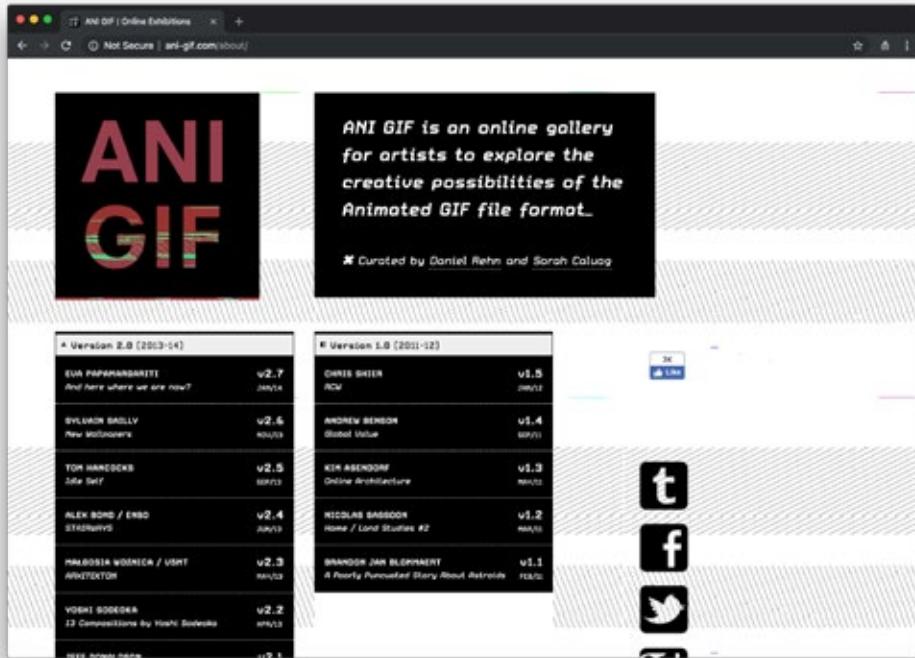
**Notes:** This online exhibition is organized as a series of individual commissions, developed between 2010–2015. Artwork thumbnails are presented as clickable elements, which open new, self-contained pages. The majority of the artworks are hosted on the exhibition site, but some video works are hosted elsewhere. The formula of white background, responsive image grid structure and minimal typography adhere to the portfolio and gallery websites from the late 2010s. The minimal, seemingly 'transparent' interface design adheres to the 'white cube' gallery space paradigm. No further context is provided for individual artworks.



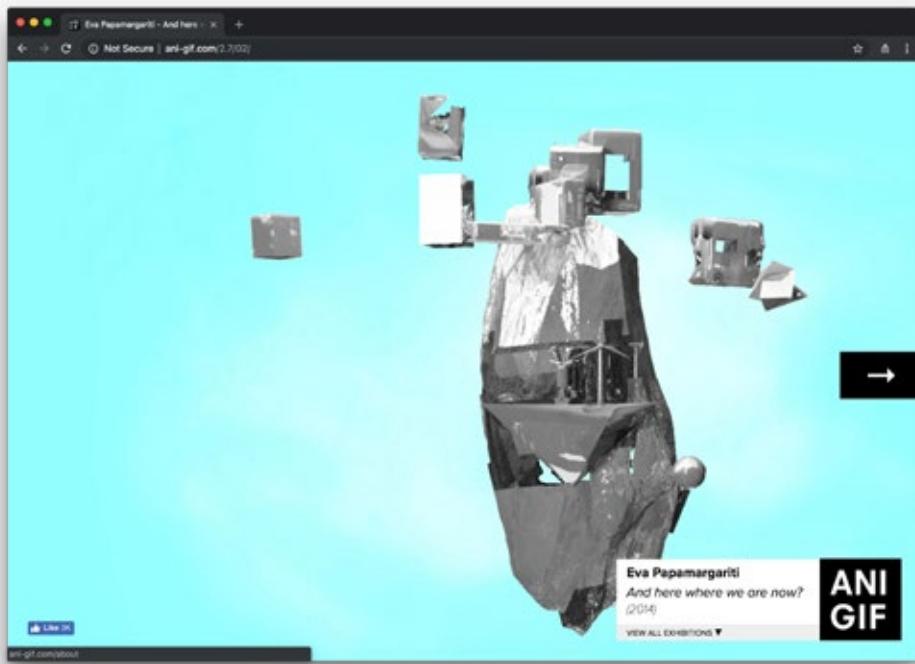
External embedded  
media



# ANI GIF (2011-2014)



Landing view of the exhibition: A chronological list of artwork titles serve as links to individual commissions. Thumbnail previews are not provided.



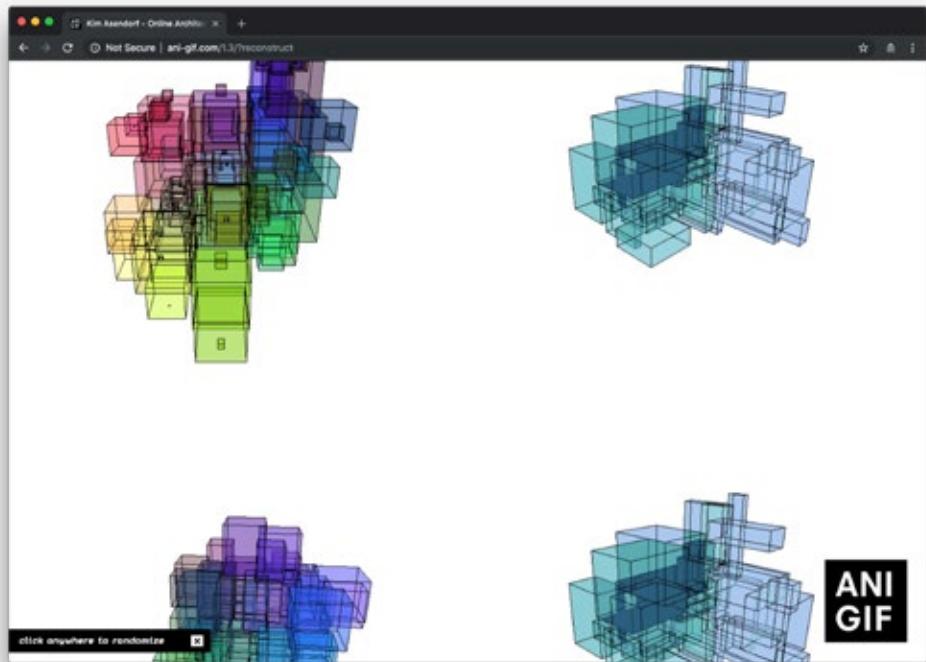
Example artwork view 1:  
Each commissioned artwork utilizes the entire space of the browser window. The only fixed page element is the square exhibition logo (lower right), which provides basic information about the artwork and links back to the homepage.

★  
Vertical scroll

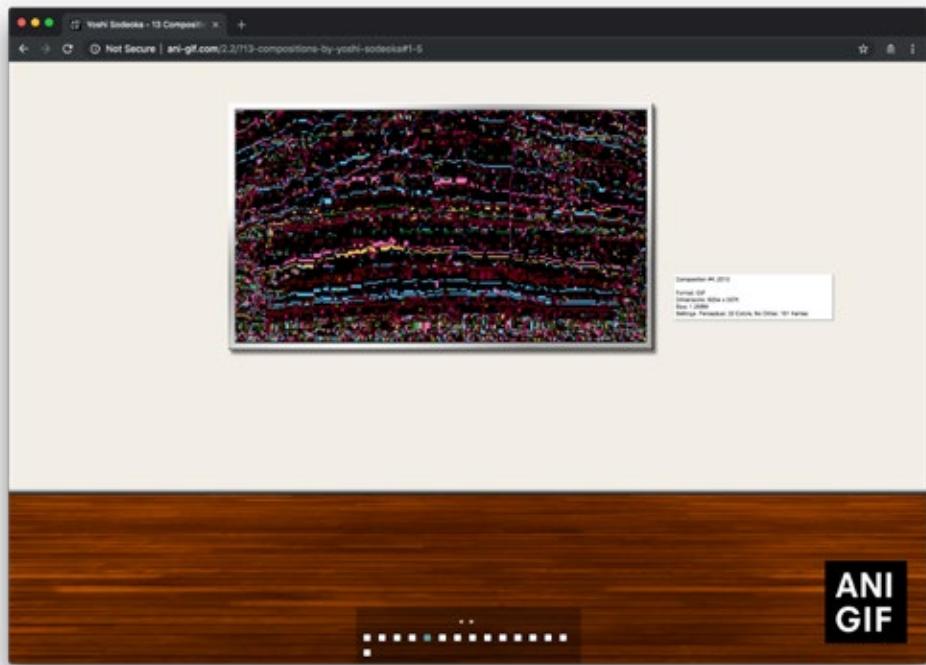
★  
Horizontal “slide” transition

★  
Virtual 3D gallery environment

*Example artwork view 2:  
This piece responds to  
vertical scrolling, and a user  
click generates alternate  
views.*



*Example artwork view 3:  
This work utilizes a  
metaphorical 3D virtual  
gallery space.*



**Reference URL:** <http://ani-gif.com/>

**Date of screenshots:** 2018-11-25

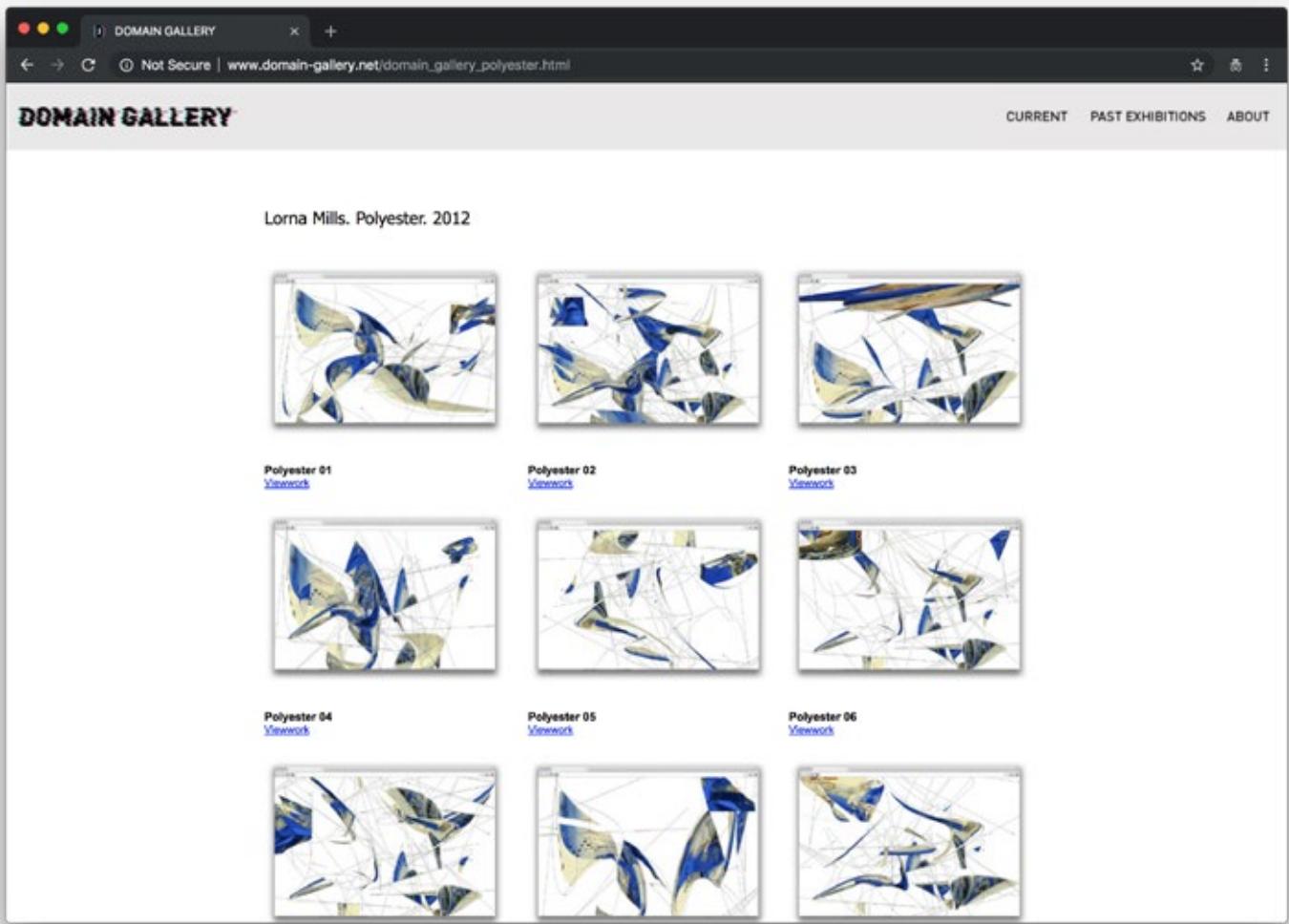
**Notes:** This online exhibition features multiple commissions by artists (each conceived as a small, stand-alone exhibition), which are all hosted on the main site's infrastructure. Some of the commissions use the vertical space of the browser for display (vertical scroll). Others use the horizontal space – via left/right arrows in a slideshow style. One of the commissions adds a secondary level of navigation and uses the browser window as a virtual 'gallery wall', adding mock frames around the artworks, and allowing horizontal panning of the wall left and right, to navigate between artworks in the 'space'.



**Artworks hosted on  
exhibition site**



# Domain Gallery – Lorna Mills (2012)



Landing view of the exhibition: The artwork previews are shown in a grid of thumbnails.



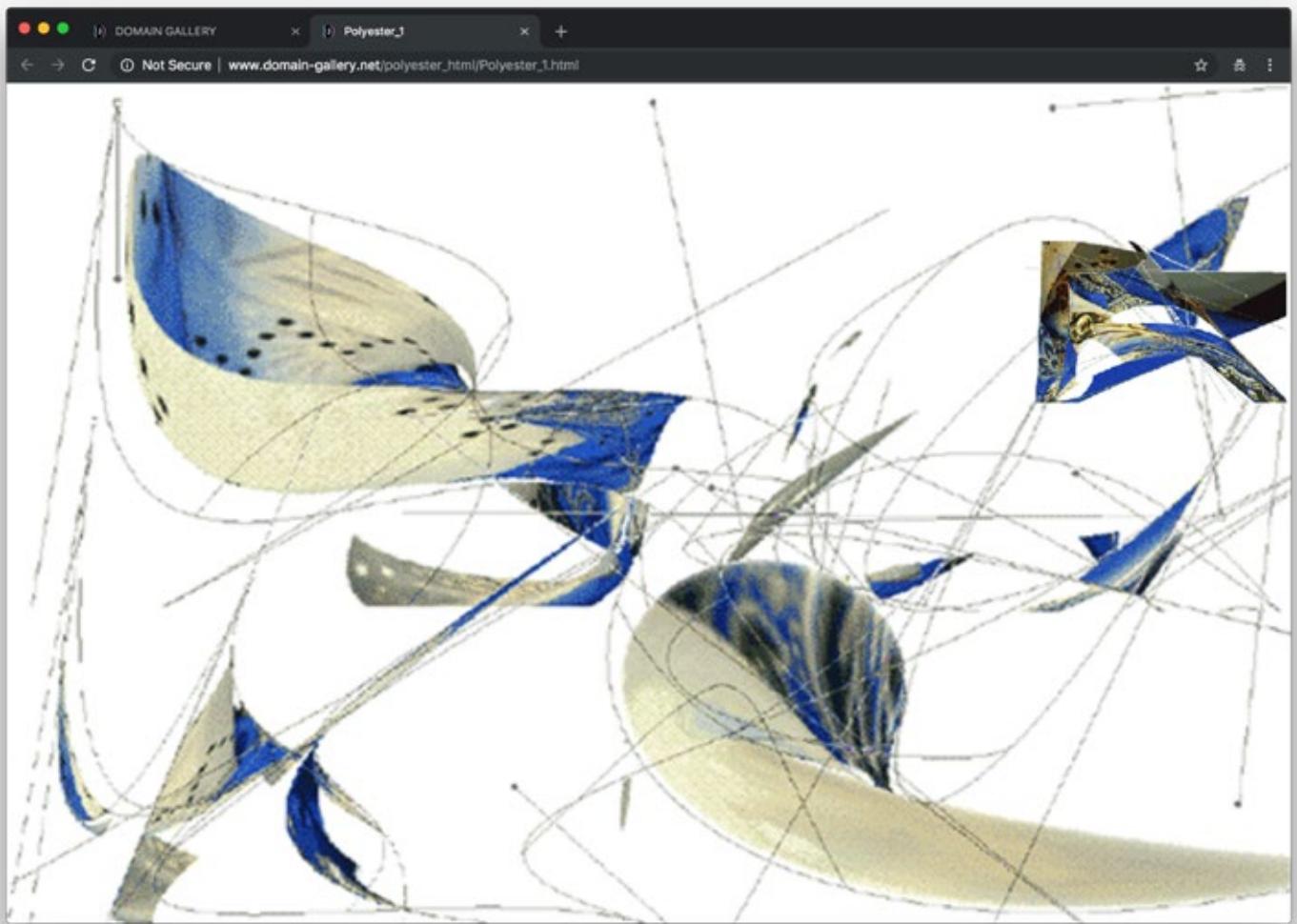
“White cube” exhibition approach



Overviews & previews



Artworks hosted on exhibition site



*Example artwork view: The artwork opens up in a new browser tab and fills the entire browser window.*



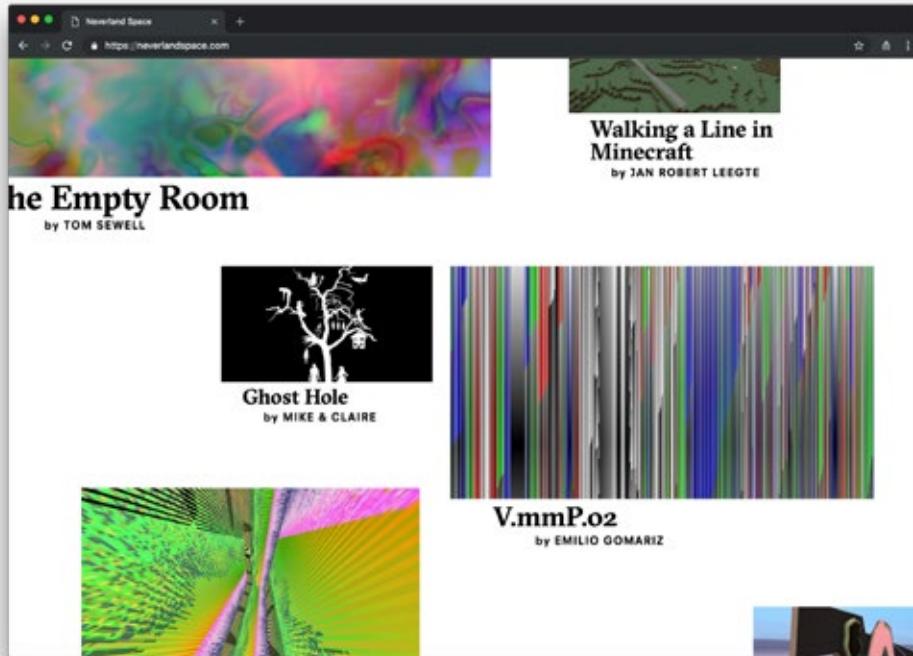
**Browser frame included  
in previews**

**Reference URL:** [http://www.domain-gallery.net/domain\\_gallery\\_polyester.html](http://www.domain-gallery.net/domain_gallery_polyester.html)

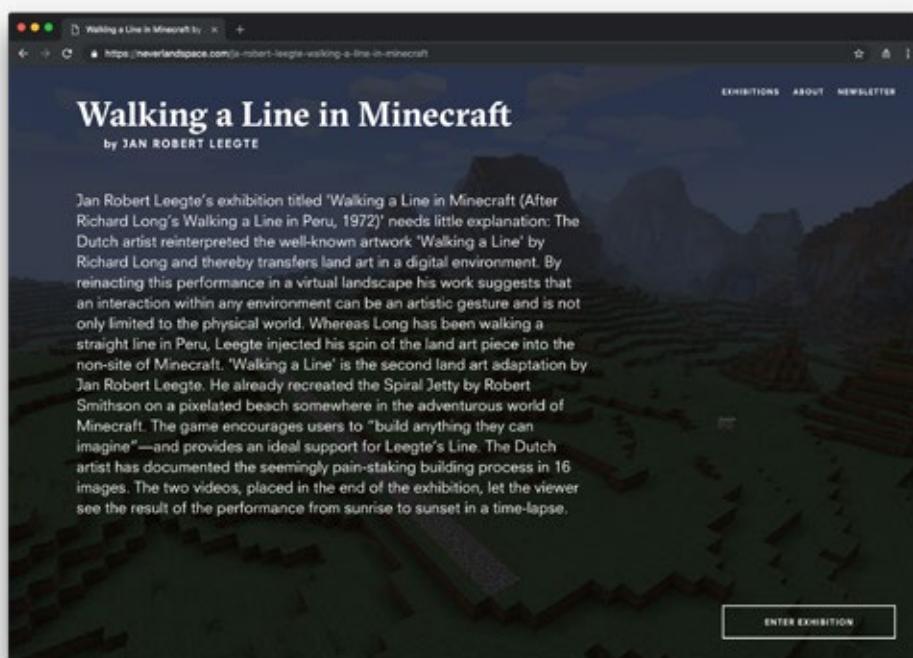
**Date of screenshots:** 2018-11-25

**Notes:** A solo show of animated gifs, all hosted on the gallery website. Artworks are accessible via links from the exhibition landing page. The landing page shows the images as a grid of screenshots including the browser window itself, which serves as a framing device and makes the landing page look like a born-digital salon wall. The overall approach is minimal – within the artwork view there is no provision of navigational instructions or additional context.

# Neverland Space – Walking a Line in Minecraft (2013)



Landing view of the exhibition website: Multiple exhibitions are featured as preview images.



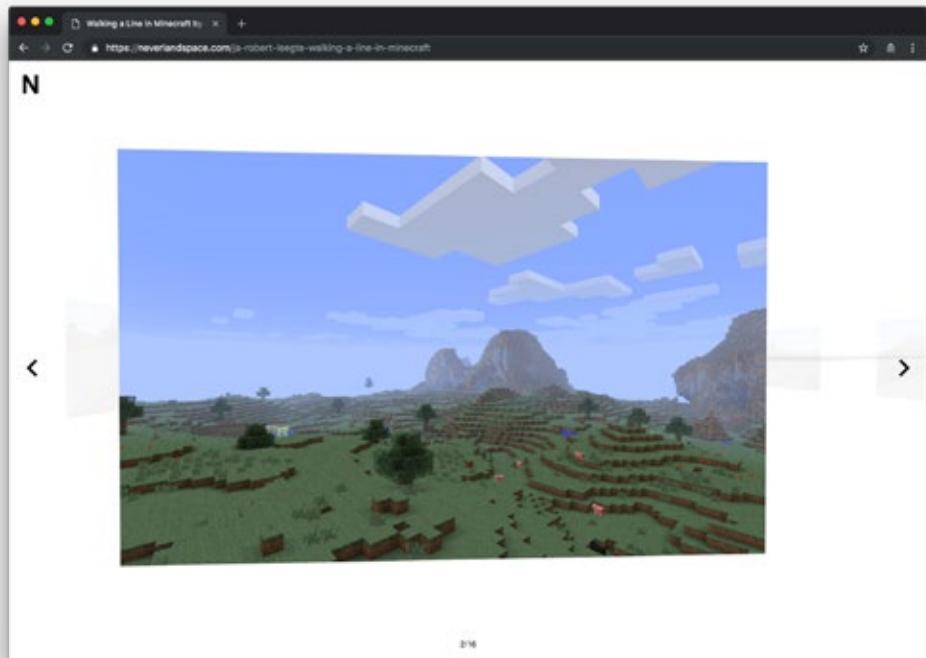
Entry point to a single exhibition.

★  
“White cube” exhibition approach

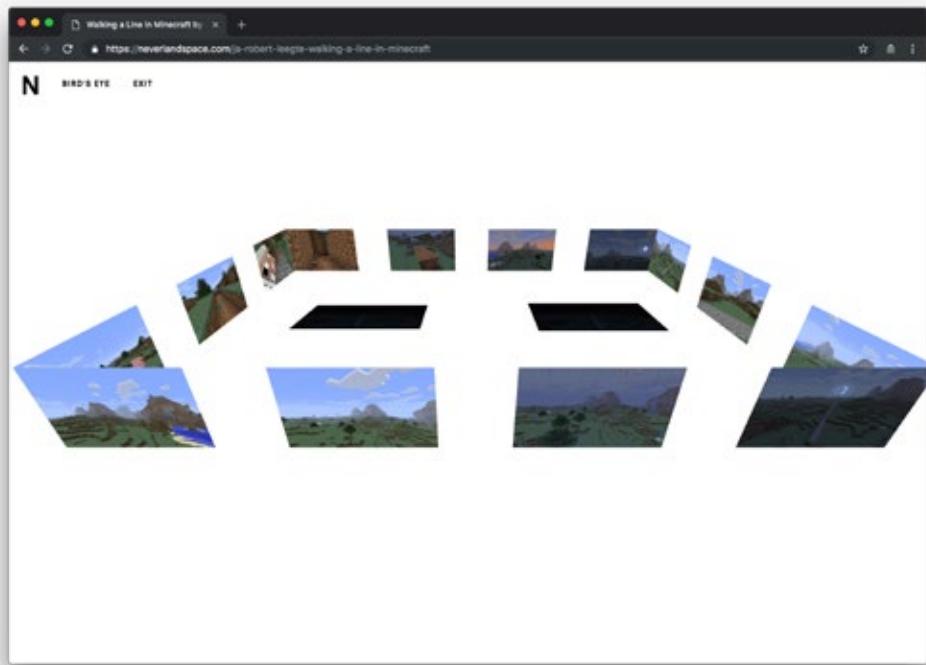
★  
Overviews & previews

★  
Virtual 3D gallery environment

*Example artwork view:  
This screenshot shows a  
zoomed-in mode, which  
features left/ right navigation  
arrows.*



*There is also an alternative  
exhibition navigation mode,  
which is a bird's eye view of  
all artworks.*



**Reference URL:** <https://neverlandspace.com>

**Date of screenshots:** 2018-11-25

**Notes:** This is an online exhibition representative of all shows staged at Neverland Space's website. These shows include still images, videos and GIF files staged as virtual installations within a blank 3D space. Offering multiple viewing modes within an otherwise empty virtual space gestures towards Metaverse tropes and strategies utilized in multiplayer online computer games, yet the overall aesthetic of the space remains within the 'transparent'/ 'white cube' paradigm. Some context is provided on each exhibition's entry page.



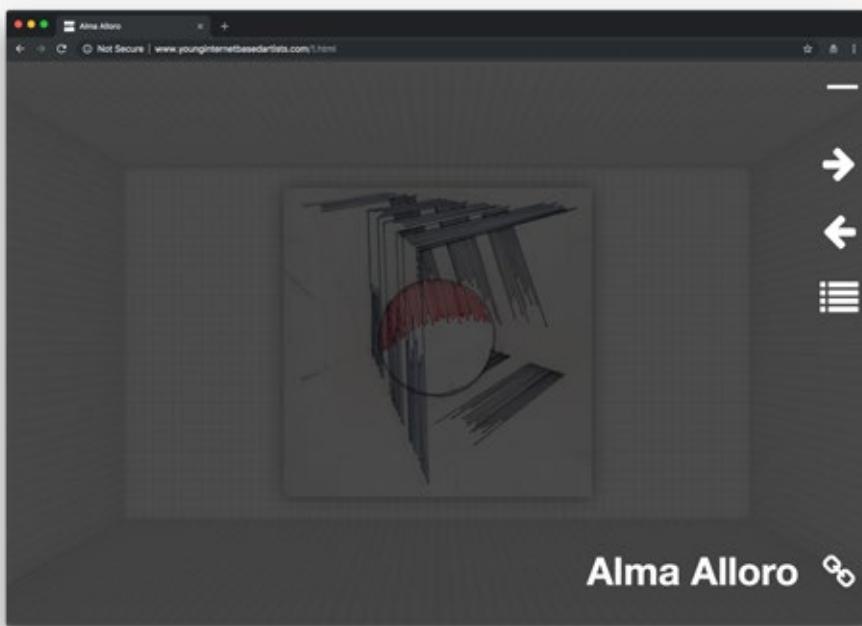
**Artworks hosted on  
exhibition site**



# Young Internet Based Artists (2013)



Landing view of the exhibition:  
In this screenshot the optional  
the information overlay is  
switched on.



Example artwork view 1:  
In this screenshot the  
optional information  
overlay is switched on.

★  
Virtual 3D gallery  
environment

★  
Horizontal “slide”  
transition

★  
Overlay state for  
contextual information

★  
External embedded  
media

★  
Artworks hosted on  
exhibition site

*Example artwork view 2:*

*In this screenshot the optional information overlay is switched off.*



*Example artwork view 3:*

*This view features embedded video.*



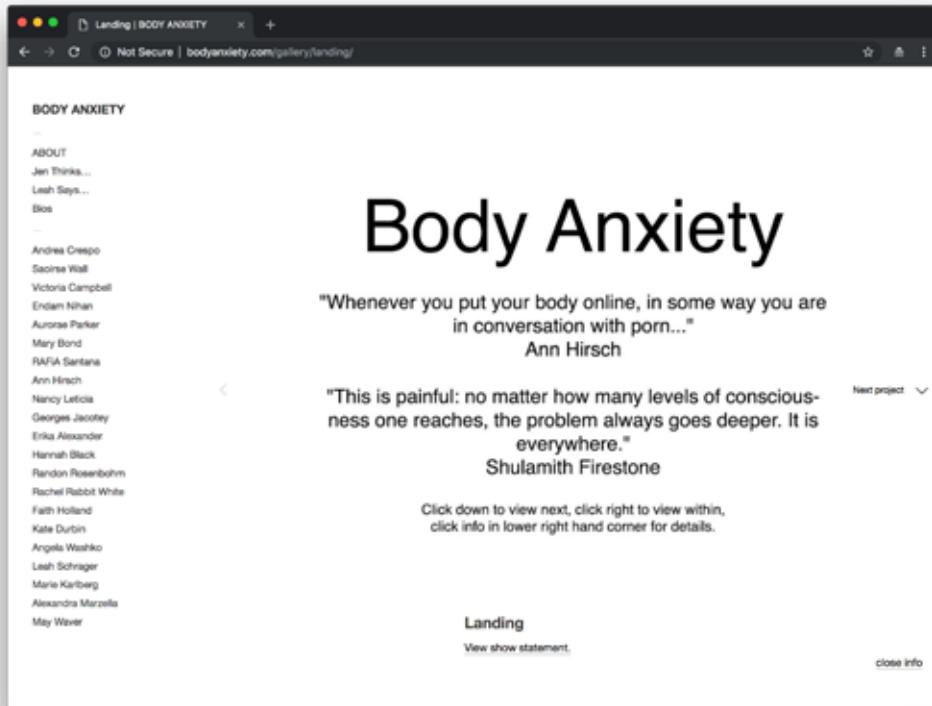
---

**Reference URL:** <http://www.younginternetbasedartists.com/>

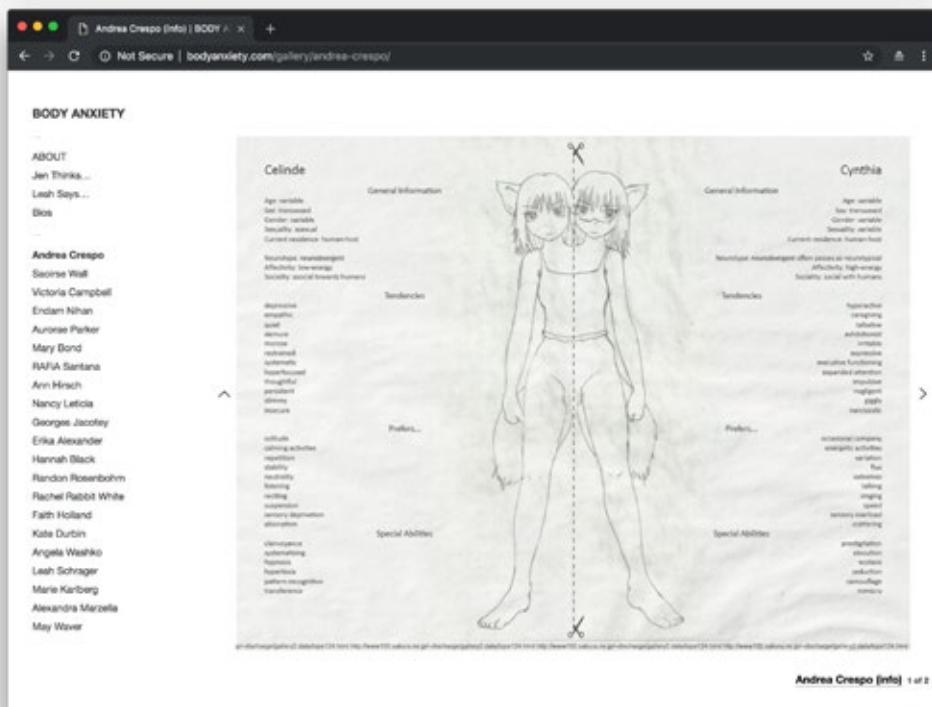
**Date of screenshots:** 2018-11-25

**Notes:** This online exhibition utilizes Gallery 404 – an open-source, browser-based 3D exhibition space tool – offering a virtual gallery wall for artists to display their work and to modify the surrounding wall surfaces. The look and feel of the 3D space resembles Metaverse tropes, and other computer game virtual worlds, but it is not an immersive environment. More conventional web-based navigation tools allow the user to either experience the exhibition as a linear slide show – with left/ right arrow controls, or to jump between artworks via a list of artists' names. All navigation controls are accessible in an overlay state from an expandable menu button. While some artworks are hosted on the site itself, others rely on external sources being embedded in the virtual gallery space.

# Body Anxiety (2015)



Landing view of the exhibition:  
A static sidebar on the left  
displays a list of all the  
exhibiting artists' names  
and functions as an index/  
navigation menu.



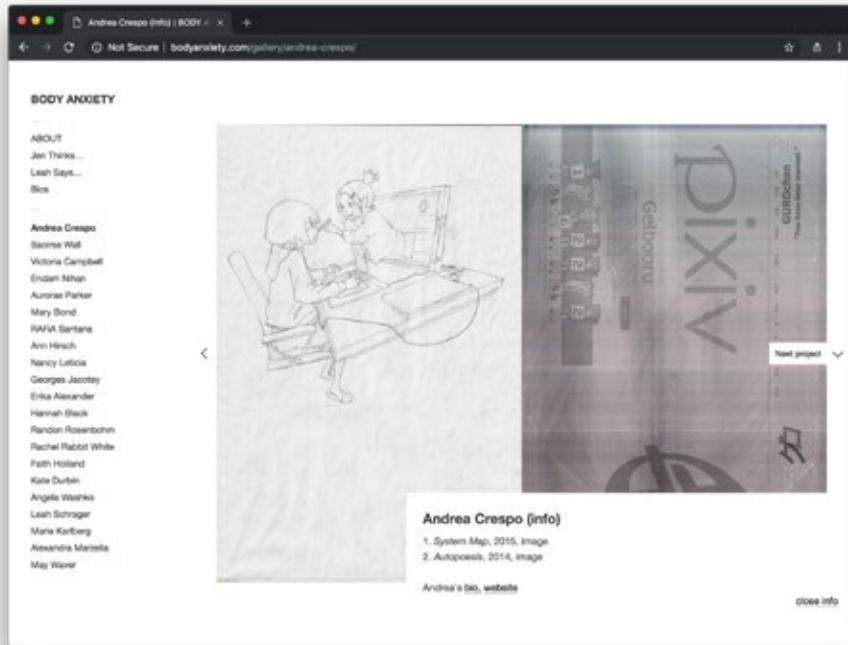
Example artwork view 1.

★  
“White cube” exhibition  
approach

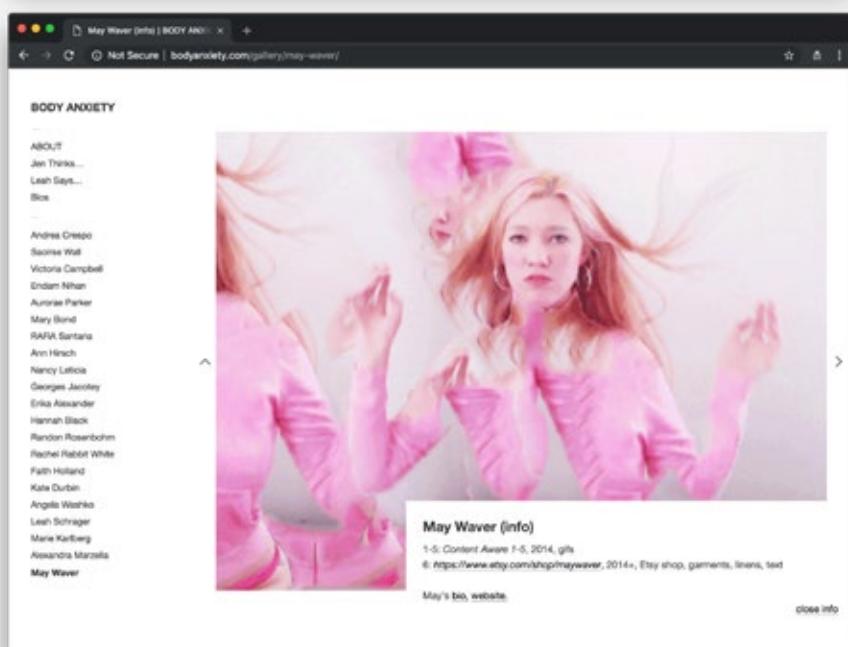
★  
Horizontal “slide”  
transition

★  
Overlay state for  
contextual information

*Example artwork view 2:*  
*In this screenshot, the information overlay panel is switched on. Navigation within projects is horizontal, and users are able to flip through a slideshow of images left to right. Navigation between projects is vertical. Users can click on the 'Next project' button (centre right) to auto-scroll down the page and reach the next project.*



*Example artwork view 3.*



**Reference URL:** <http://bodyanxiety.com/>

**Date of screenshots:** 2018-11-25

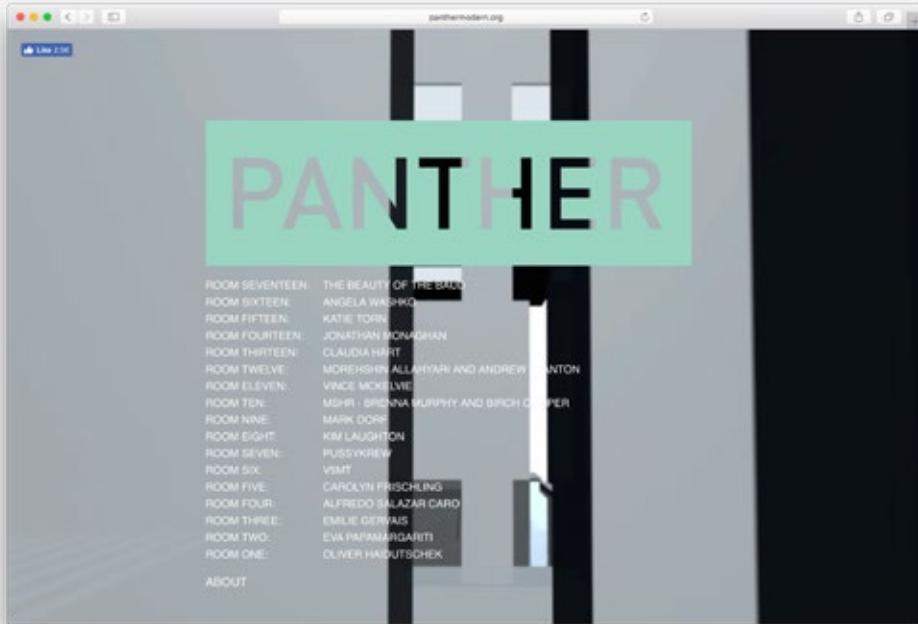
**Notes:** The white space and the straightforward navigation style adhere to the portfolio and gallery websites from the late 2010s. The overall layout follows the established “index + exhibit format” popularised by the Indexhibit platform, still widely used by artists and designers to date. An ‘invisible’ / ‘transparent’ approach to the interface design adheres to the ‘white cube’ gallery space paradigm. Limited contextual information is provided via the ‘info’ button (lower right) which opens an overlay panel. The medium labels suggest where the artworks are hosted – images and animated GIFs are hosted on the exhibition site; videos are embedded from external platforms; websites are added as links only.



**External embedded media**



# Panther Modern (2014–2016)



Landing view of the exhibition 1:  
Artists/ exhibition areas are listed  
in an index list format.



Landing view of the exhibition 2:  
A video pans around the 3D  
virtual space in the background  
(not available in all browsers).



Virtual 3D gallery  
environment

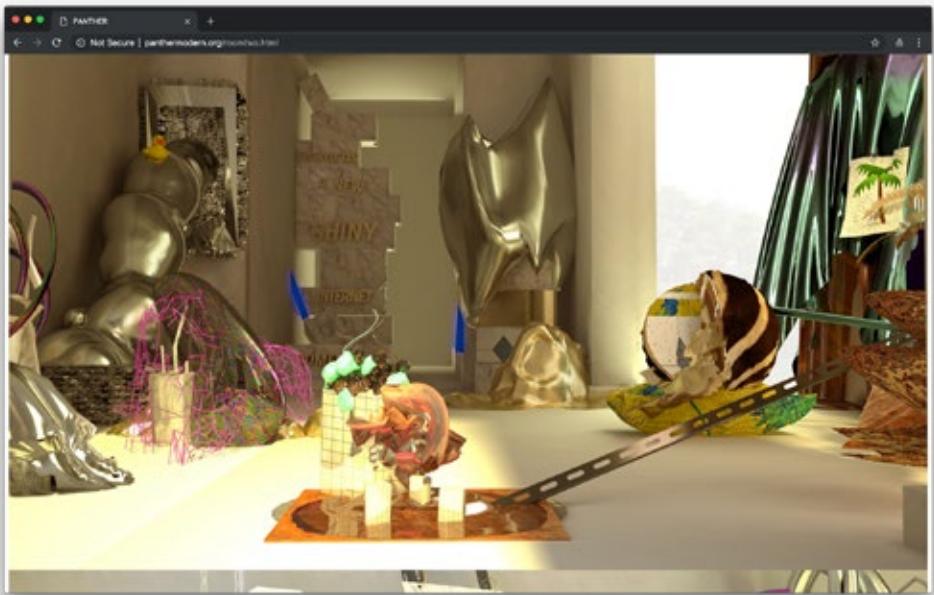


Artworks hosted on  
exhibition site

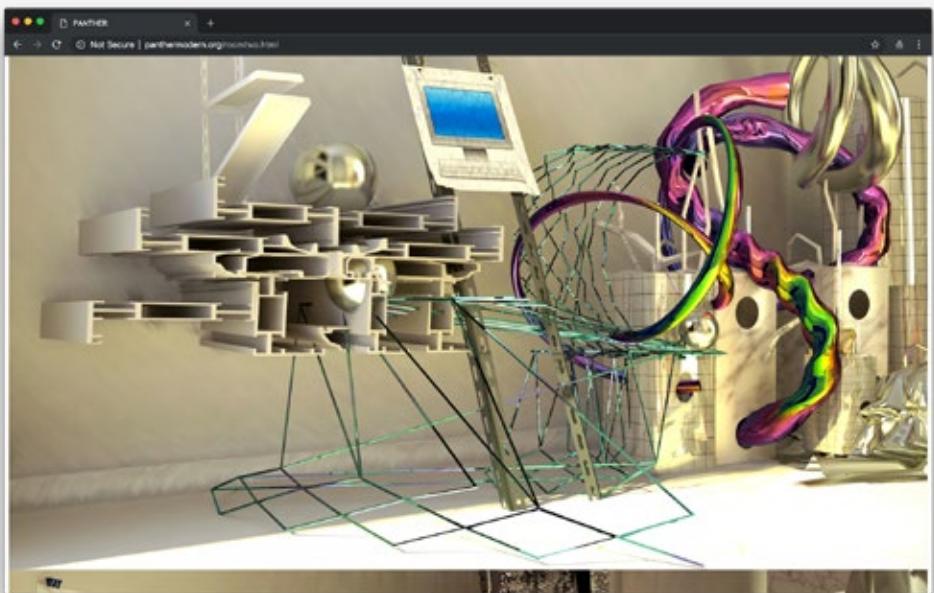


External embedded  
media

*Example artwork view 1:  
A series of images are  
stacked vertically on the  
page.*



*Example artwork view 2.*



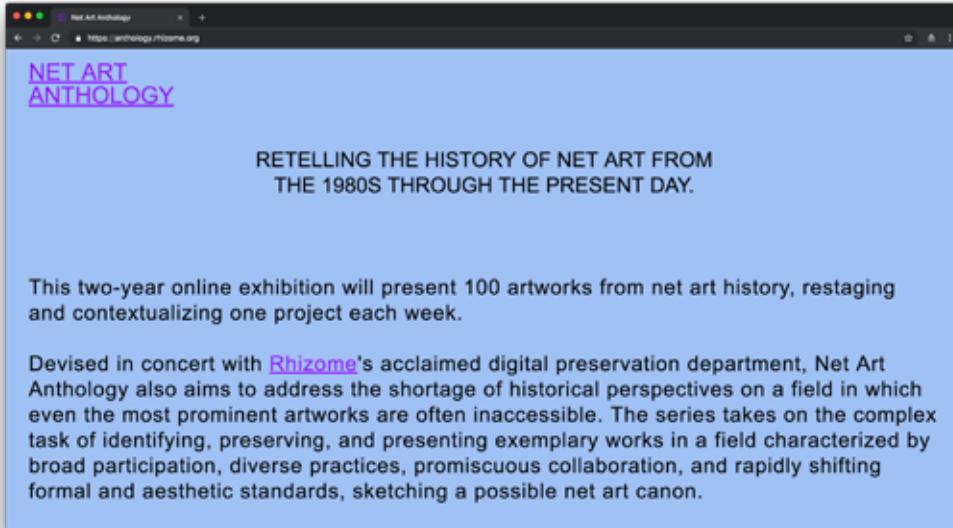
---

**Reference URL:** <http://panthermodern.org/>

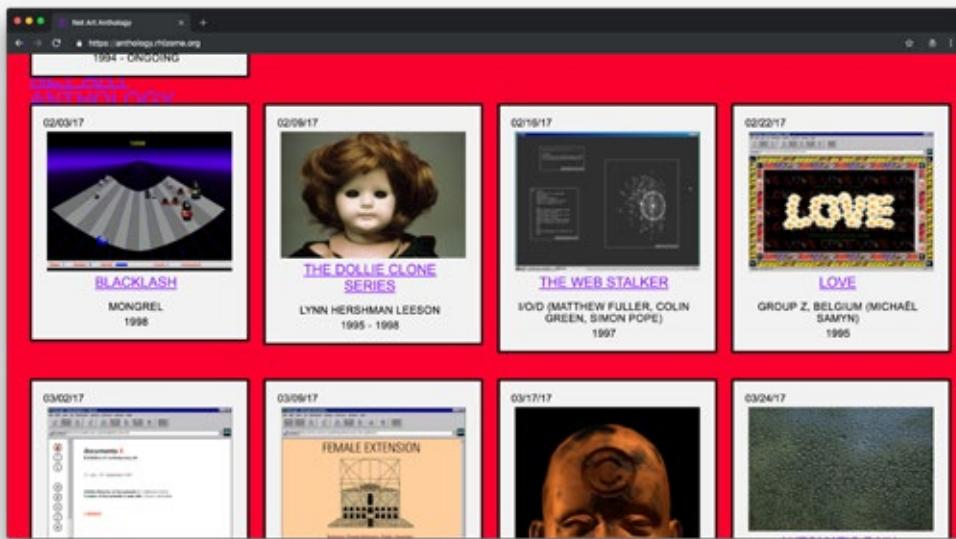
**Date of screenshots:** 2018-11-25

**Notes:** Panther Modern is a file-based exhibition space. Each artist is allocated a 'room' to create a site-specific work. Rooms are linked visually in the images rendering the 3D-modelled space, but not structurally: i.e. users cannot navigate across the 3D modelled space or from one room page to another. The works are presented mostly as a series of .jpg images stacked in a vertical scroll. Some pages (but not all) require the no longer supported Unity-3D web player browser plug-in, and in its absence load only the static .jpg images. This indicates that the exhibition was originally conceived as a fully immersive environment, borrowing paradigms from computer game virtual worlds, but due to the Unity-3D plug-in's obsolescence this level of interaction is no longer available to the user.

# Net Art Anthology (2016–2018)



Landing view of the exhibition 1:  
A short text introduces the exhibition context.



Landing view of the exhibition 2:  
An overview of the exhibition is provided via chapter divisions and previews of the artworks as thumbnail images.

★  
**Overviews & previews**

★  
**Vertical scroll**

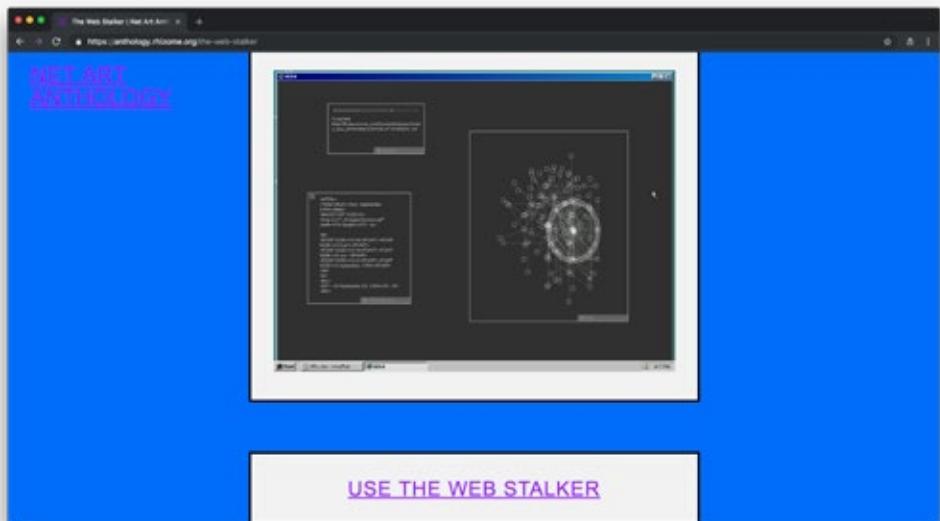
★  
**Browser frame included in previews**

★  
**Rich context**

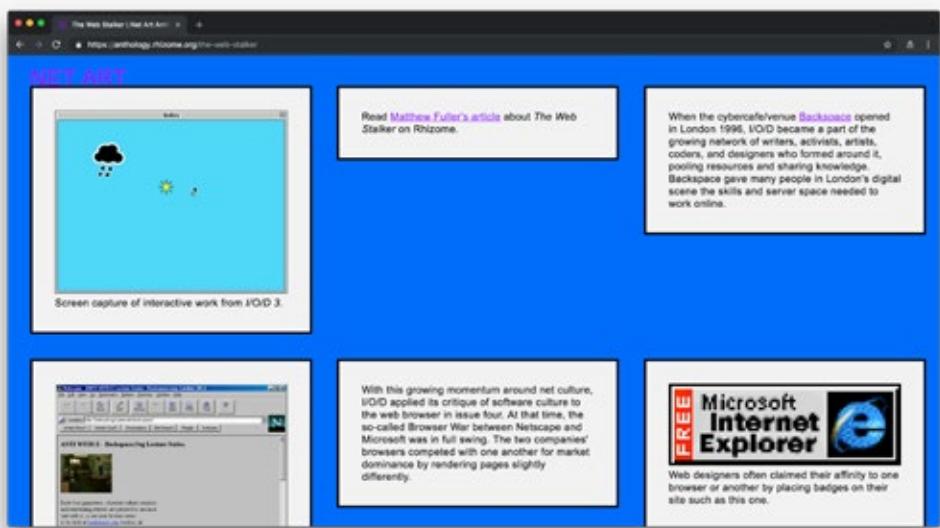
★  
**Artworks hosted on exhibition site**

★  
**Emulated environments**

*Example artwork view 1:  
A representation screenshot  
and entry point button are  
constant features across all  
artwork presentations.*



*Example artwork view 2:  
Further contextual  
supplements are presented  
in bite-sized ‘chunks’ of  
visual/ textual information.*



**Reference URL:** <https://anthology.rhizome.org/>

**Date of screenshots:** 2018-11-25

**Notes:** The Net Art Anthology is Rhizome's most recent exhibition of net art. During user research sessions, users were asked to comment on the interface design. Stand-out features were: the generous size of artwork previews, which provide an at-a-glance overview of the exhibition; the rich contextual information around artworks (including supplementary literature and published texts); as well as the emulated representations of artworks in their native environments.



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# Summary and recommendations

## Summary of the review

This report has reviewed 46 different interfaces ranging from institutional to experimental projects. The review pulled out key features from these interfaces into “feature cards” visible in the bottom of the page below each respective project. These features do not aim to describe in detail all possible interactions with the interface, but rather describe just a key concept or interaction paradigm which may have relevance to the re-design of the ArtBase archive (or in some cases – not, as discussed in attendant notes).

The cards have been assorted below into categories relating to the general structure of the data in the archive (or how the archival software has been developed), as well as to discovery and entry into the collections, to the single-record-level page and its metadata, and finally to how net art has been exhibited online. The cards have been ordered by the number of occurrences registered during the review. This order does not aim to suggest that a certain feature is more important because it is included in interfaces more widely, but rather to simply suggest what features are established already vs features which are only now starting to gain popularity. And even so – some features may be present in 7-8 examples from the review, but if all of these examples are experimental projects, those features may not always be appropriate for other contexts, such as institutional collections. This is to say that the “popularity” of features would have some impact on whether they are recommended in the ArtBase re-design or not, to the extent that features that are utilized often are most likely to be interaction paradigms which have already been tested with users and proven to be useful. But the primary criteria for selecting which features would be developed in the ArtBase re-design, is whether these reflect some of the user stories developed during the user testing sessions and whether they are compatible with the infrastructure setup already put in place by the preservation team at Rhizome.

Following the listing of feature cards organized by categories, a series of diagrams matches feature cards to user story cards from Report #2.

Finally, a list of recommendations describes some of the proposed features to be developed further during the prototyping stages of the re-design process.



# Features related to database setup and data structure

★ x 13

Linked data

★ x 4

Explorable terminology

★ x 4

Capacity for contradiction

★ x 5

Invitation to contribute

★ x 4

Open source

# Features related to entry points and discovery

★ x 18

Overviews & previews

★ x 10

Generous interfaces

★ x 7

Data viz

★ x 6

Multi-object timeline

★ x 7

Expression of relations

★ x 5

Sort by colour

★ x 3

Links to related queries

★ x 3

Network diagram

★ x 3

Randomization

★ x 4

Curated selections

★ x 3

SPARQL query GUI

## Features related to single-record-level pages

★ x 5 Single-object timeline	★ x 4 Metadata clustering	★ x 2 Metadata richness indicator
★ x 2 Metadata related to literature & events	★ x 2 Natural language summary generated from structured data	★ x 2 Metadata in collapsible element
★ x 1 Metadata in collapsed sidepanel	★ x 1 Metadata checklist	★ x 3 Access statement

## Features related to net art presentation

★ x 7 Artworks hosted on exhibition site	★ x 4 “White cube” exhibition approach	★ x 4 Virtual 3D gallery environment
★ x 4 External embedded media	★ x 3 Horizontal “slide” transition	★ x 2 Vertical scroll
★ x 2 Overlay state for contextual information	★ x 2 Browser frame included in previews	★ x 1 Rich context

# Matching feature cards to user story cards

Features related to database setup and data structure

Invitation to contribute

“  
As an artist, I want to see the archive as a wiki that is open rather than closed and where people can have accounts, so that they may contribute data that they might not normally disclose.

Features related to entry points and discovery

Overviews & previews

“  
As an ArtBase user, I want to have multiple entry points to browsing the works, such as sort-by-colour, curated lists or a random button, so that I can discover new works in serendipitous ways.

“  
As an ArtBase user, I want to filter artworks by keywords or categories, so that I can gain an overview of what types of things are present in the collection.

“  
As an ArtBase user, I want to see a list of all tags used in the archive, so that I can gain an overview of what types of things are present in the collection.

## Diagram key



User story from study 2: general users



User story featured as key insight



User story from study 3: researchers



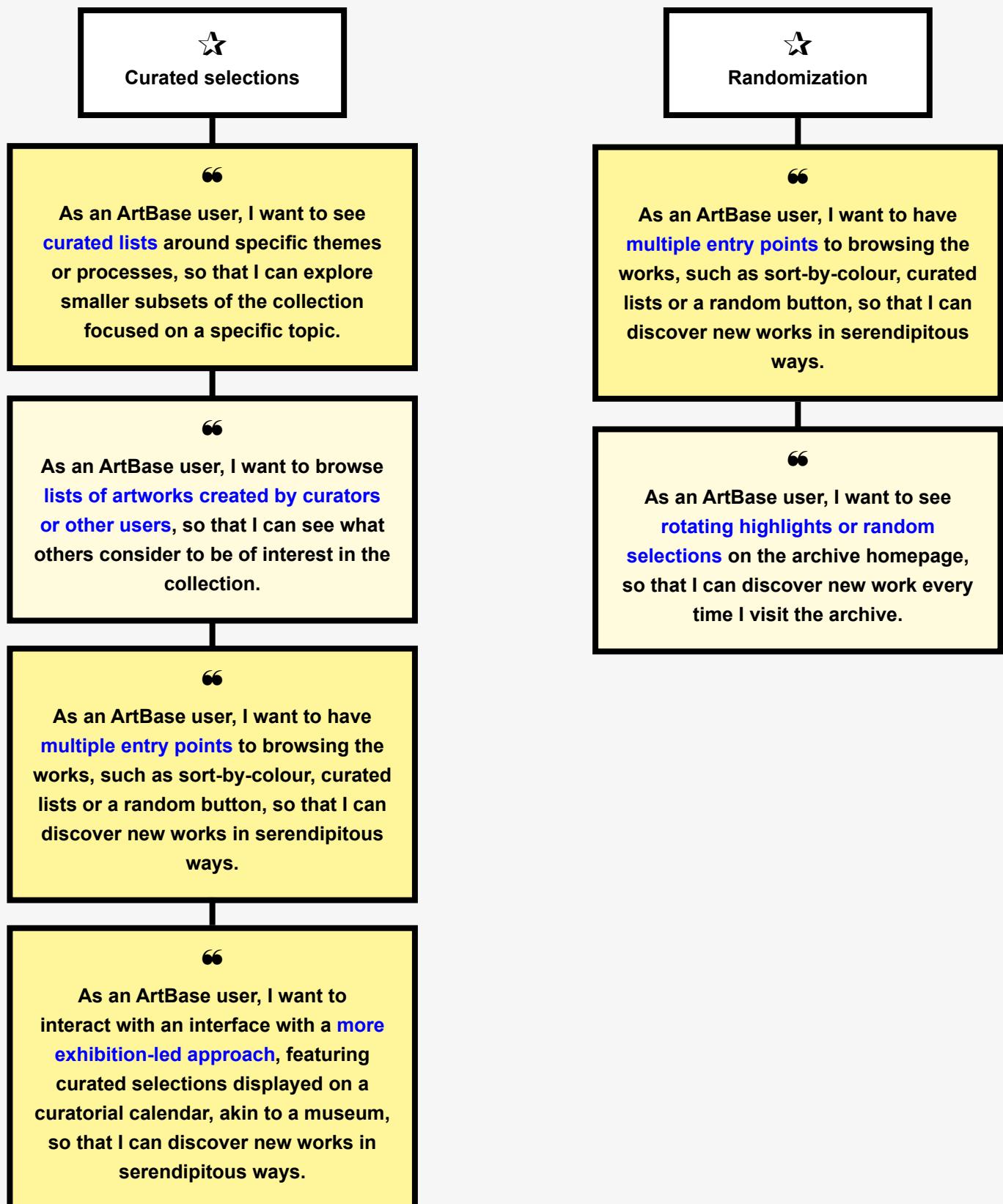
User story featured as key insight



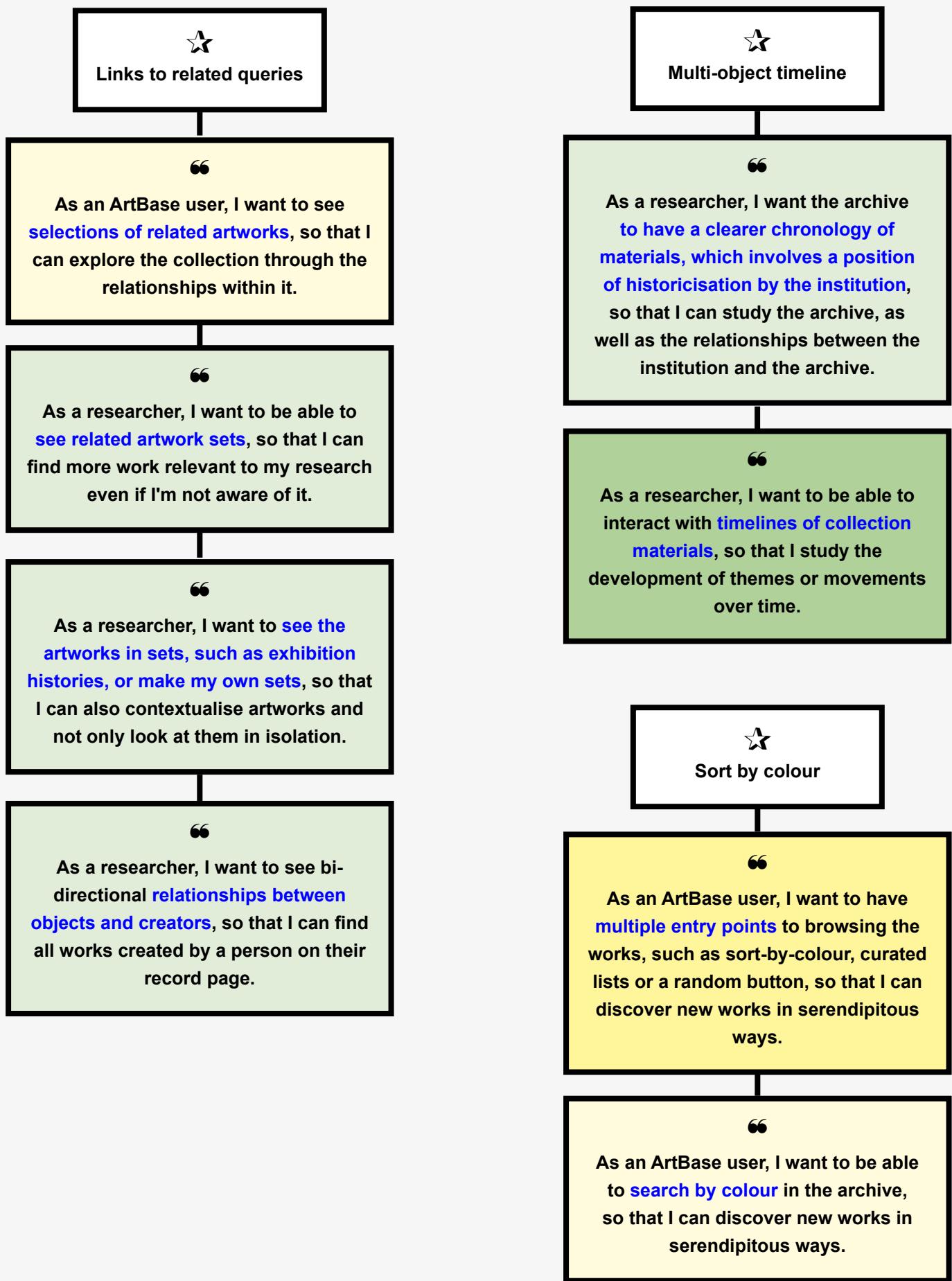
User story from study 4: artists

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Features related to entry points  
and discovery



Features related to entry points  
and discovery



Features related to entry points  
and discovery

Features related to single  
record-level pages



### SPARQL query GUI

“  
As an ArtBase user, I want to interact with a **search query interface**, so that I can do research into very specific elements of the collection.



### Single-object timeline

“  
As a researcher, I want to use more **sophisticated search tools** with facets or filters similar to academic journal databases, so that I can create more precise search queries.

“  
As an ArtBase user, I want to see more **temporal contextual information** around each artwork, so that I have to do less research in other sources.

“  
As a researcher, I want to have an **expanded search capability**, including keywords, subject, media, form, etc, so that it can find works in the archive relevant to my research interests.

“  
As a researcher, I want to be able to see a **form of versioning in the archive**, so that I can study how artworks change over time, who are the actors involved in changes over time, the relationship to authorship, and also the role of the audience.

“  
As a researcher, I want to see a **clear temporal dimension in the presentation**, so that I know what timeframe I am looking at in an emulated presentation when the emulator is pointing to an archival copy of the work.

“  
As a researcher, I want to be able to see more **provenance or preservation metadata**, so that I can better understand the history of this work within Rhizome's collection and how it has been cared for over time.

Features related to single record-level pages

★  
Metadata related to literature & events

“

As a researcher, I want to see information about **exhibition history** and **publications** featuring the work, so that I can get an idea of how the work has been shown and received over time.

★  
Metadata clustering

“

As a researcher, I want the **metadata for the artwork records presented in a more granular way**, so that I can choose how much metadata to see if/when I need it.

★  
Metadata richness indicator

“

As a researcher, I want to see artwork **metadata, even if it's incomplete or inconsistent**, so that I can assess the work within my understanding of the archive as a collaborative, evolving and imperfect space.

★  
Access statement

“

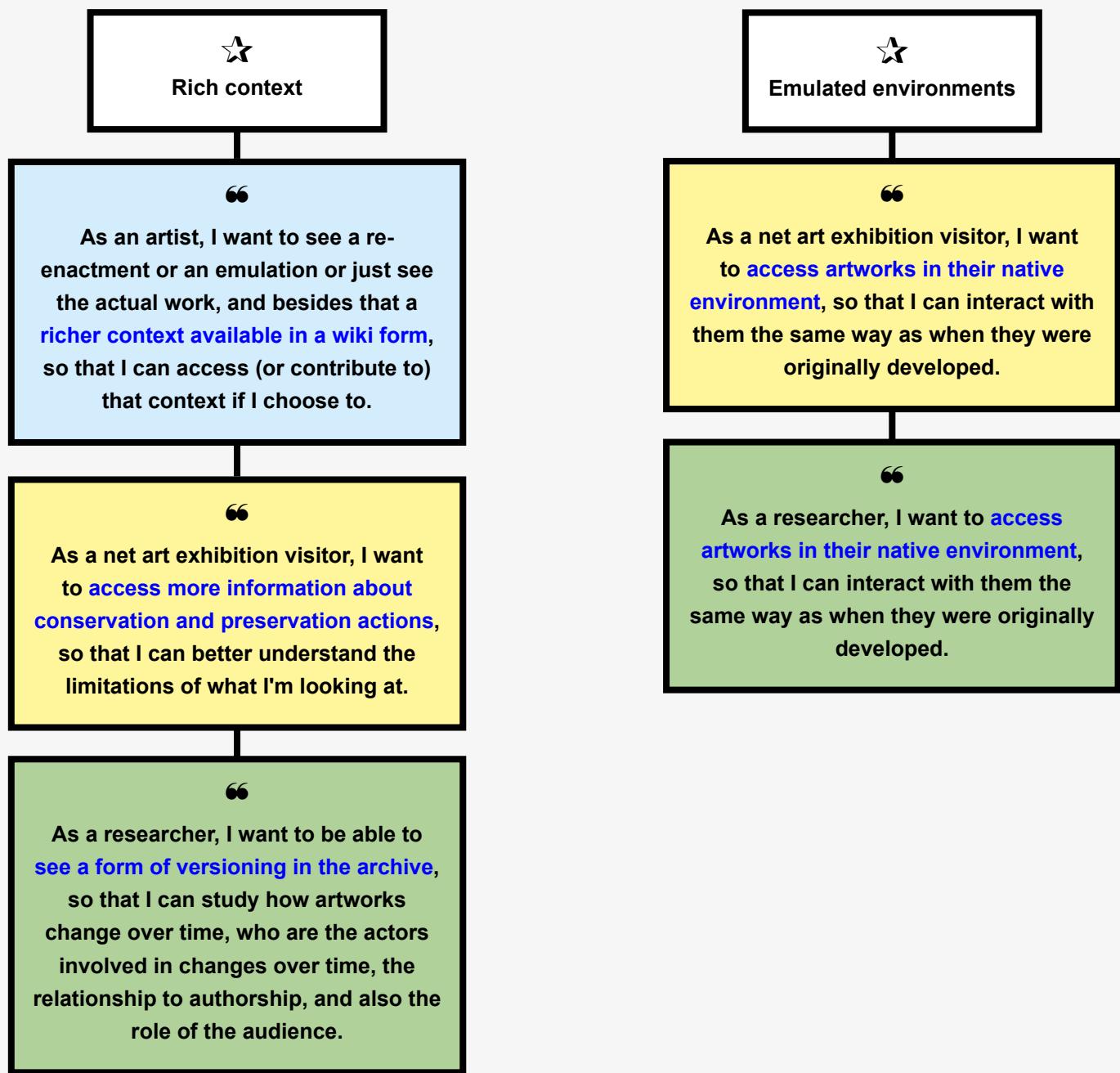
As an ArtBase user, I want to see functional and informative **artwork entry points**, so that I know what to expect when I try to access the artwork.

“

As an artist, I want to be able to **access the artworks quickly and easily**, so that I don't have to go through a lot of text or other context before I can look at the art.

---

Features related to net art presentation



# Recommended features



## Linked data

Features related to database setup and data structure



## Explorable terminology

The following features are recommended to be implemented in the design prototype not because they directly map to user stories, but because they can facilitate many of the requirements identified throughout the Discovery and User Research Phase.

**Linked data** is growing in popularity in many GLAM organizations due to its capacity to facilitate increasingly complex relationships

between database items and across heterogeneous databases. In addition, the

search queries which can be performed within the database are key to turning

many of the user stories gathered around archive navigation and discovery into

functional user interactions in the prototype interface.

**Explorable terminology** can be particularly useful to providing richer metadata around conservation

procedures or technical dependencies, which has been requested by users.

The **capacity for contradiction**, inherent in the Wikibase/ Wikidata data

models, is a further useful feature for users who want to see more metadata

rather than less, and want to know the origin of metadata elements throughout

the history of the archive. When new metadata is added to the database,

instead of supplanting older information, it can be recorded alongside it, as

long as a differentiating source and point in time are also added. The capacity

for recording multiple and potentially contradicting pieces of information can

also be a valuable feature of the archive design, if the archive is opened once

again for contributions from external users. Contributions from the public can

be enabled by either providing information to an institutional representative via

online forms or other communication channels, or contributing directly by logging

into a user account to the database. The idea of **inviting users to collaborate**

with archivists in archival systems is present in the examples reviewed in this

report and has also been mapped to some user stories. The Wikibase system

currently in place at Rhizome can facilitate either direct user contributions – via

user login – or can simply include a prompt for users to get in touch if they want

their contribution recorded in the database. Finally, it is beyond the scope of this

report to go into detail as to why using **open source** software is the right choice

to base their archival infrastructure on for an organization such as Rhizome.

This recommendation is based on evidence from other GLAM research projects

(see Bibliography), the brief interface design review conducted here, as well as

conversations with staff at Rhizome.

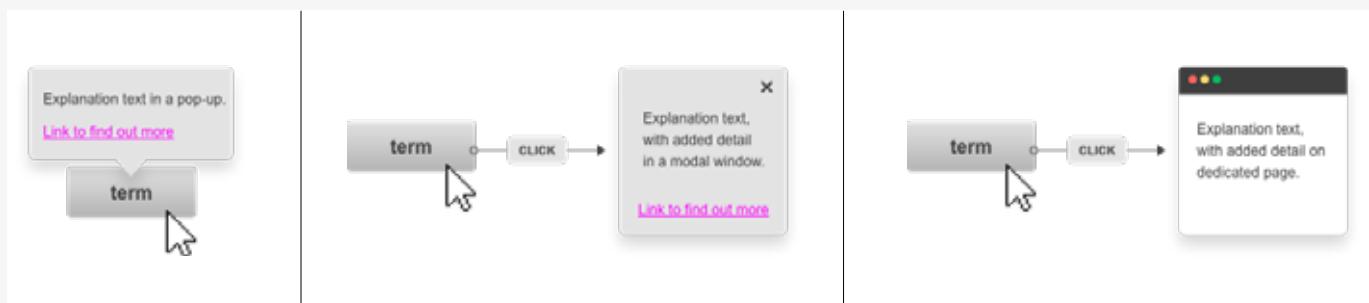


## Invitation to contribute



## Open source

# Wireframe mock-ups



Explorable terminology

A wireframe representation of a "Metadata statement" interface. It consists of two main sections separated by a horizontal line:

- Top Section:** Labeled "Metadata value A". It contains a text input field and a link "Source A".
- Bottom Section:** Labeled "Metadata value B". It contains a text input field and a link "Source B".

Capacity for contradiction

The diagram shows two separate wireframe components, each featuring a button and a modal dialog.

- Top Component:** A button labeled "Contribute" is shown with a mouse cursor hovering over it. A callout bubble above the button contains the text "CLICK". A modal dialog box titled "E-mail" contains fields for "example@mail.com" and a password (represented by dots). A "Log in" button at the bottom of the dialog is also highlighted with a mouse cursor.
- Bottom Component:** A button labeled "Report issue?" is shown with a mouse cursor hovering over it. A callout bubble above the button contains the text "CLICK". A modal dialog box contains the text "Special form for reporting on missing or erroneous data." and a "Submit" button at the bottom.

Invitation to contribute



# Recommended features



## Overviews & previews

Features related to entry points and discovery



## Multi-object timeline

The concept of **overviews and previews** in digital collection interfaces has been developed over a long period of time (see Green, et al, 2000) and has been well established as a standard user interaction pattern. All interfaces reviewed in this report implement variations on this pattern.

The pattern also matches a number of user stories focused on different ways of navigation and filtering a collection in order to gain a sense of its scope. Closely related to the concept of the overview, is the **multi-object timeline** featuring object previews. The timeline is another well-established user interaction pattern, present in many of the interfaces reviewed here, that has also come up in the user stories and will be a useful addition to the ArtBase interface.

While the timeline can indicate relationships between collection items based on a temporal dimension, other formats for **expressing relations** between items will also be useful in a linked data archive, where various forms of relationships can emerge organically.

The idea of seeing items as “sets” has come up numerous times in the user stories, and a design pattern which can express relations such as common exhibition histories or common technical dependencies will match closely the requirements discussed with ArtBase users. Also related to this concept, is the possibility to provide users with **links to pre-set queries**, both as a navigational tool and a tool to understand context and relationality in the archive. This is already a common interaction pattern in interfaces using linked data infrastructure.

**Curated and random features** are both common interaction patterns in digital collection interfaces (whether these are standard relational or linked data databases). Unsurprisingly, given the familiarity of such patterns, in the forms of featured lists, curated special collections, or just a random button, they also featured heavily in the user stories generated during the user research phase.

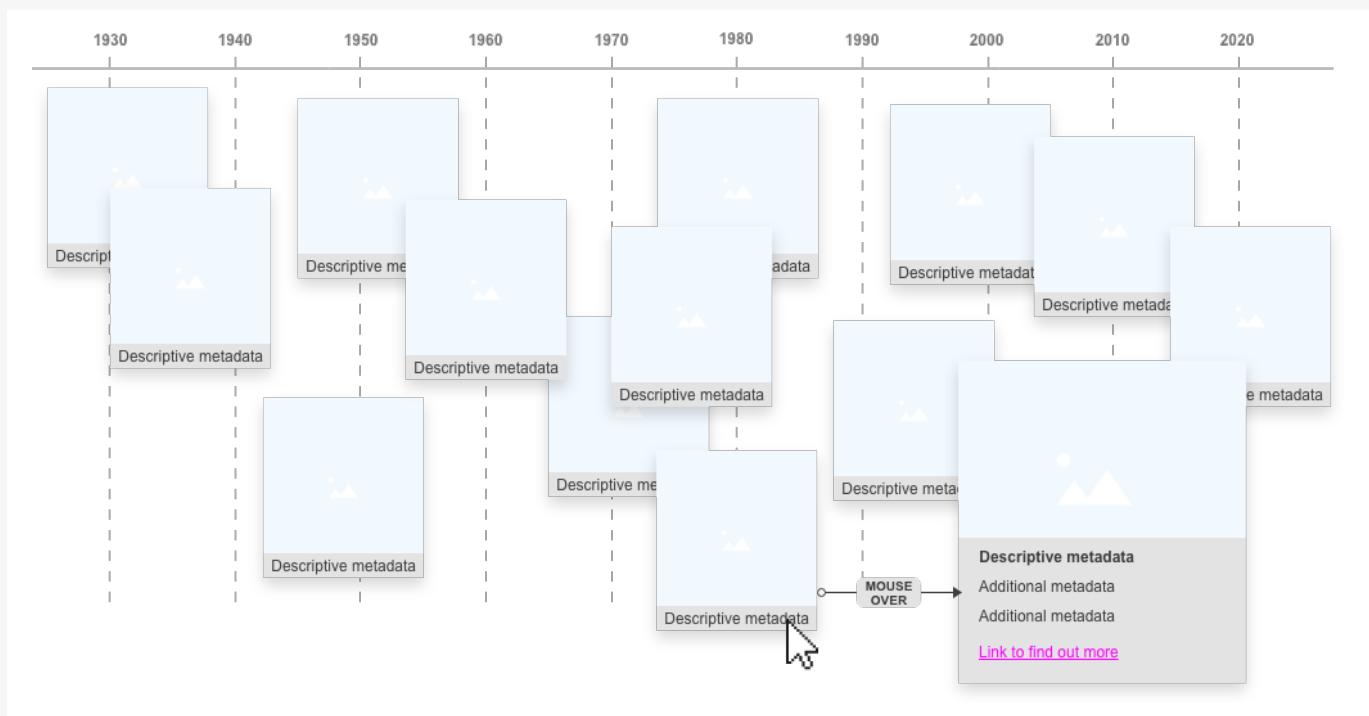
Finally, various user stories featured requirements for more sophisticated search tools to be present in the archive. While most of the interfaces reviewed in this report feature some form of a search facility, it is rarely capable to facilitate the complex search needs some users (and particularly researchers) might have. Running search queries within a linked data database with SPARQL, on the other hand, could facilitate such search needs. However, mastering SPARQL and crucially – understanding the database model sufficiently to be able to query it, present steep learning curves, which not everyone will be able to overcome.

Developing a functional GUI to run the queries would be an important goal for GLAMs who want to use linked data. So far such efforts have been few and not deeply researched. Therefore, while developing a custom **SPARQL query GUI** for the ArtBase is highly recommended, such development will likely be a long-term goal that might not be resolved for some time yet. Features related to database setup and data structure.



## SPARQL query GUI

# Wireframe mock-ups



Overviews & previews / Multi-object timeline

This wireframe shows a section titled "Related works" containing three categories of items:

- Common quality A:** Displays four items, each with a small preview image and a "Descriptive metadata" box below it. A right-pointing arrow indicates more items.
- Common quality B:** Displays four items, each with a small preview image and a "Descriptive metadata" box below it. A right-pointing arrow indicates more items.
- Common quality C:** Displays four items, each with a small preview image. A downward-pointing arrow indicates more items.

Expression of relation / Related queries

# Recommended features



## Single-object timeline

Features related to single record-level pages



## Metadata related to literature & events

Of all the features present in the reviewed interfaces, the **single-object timeline** is the one which could address a number of user needs (reflected in user stories around temporal context, versioning of artworks and preservation history), and yet has been utilised the least for precisely such purposes in existing collection interfaces. The examples reviewed here, which featured a timeline, usually relate only to person records – where the timeline is a way to record events during a person's lifetime. For digital cultural heritage objects which also undergo various events throughout their lifecycle in archives and collections, the single-object timeline can also be a concise and impactful visual tool to represent those events. Related to that need for metadata positioning an object in a temporal and historical context, is the concept of featuring **metadata related to literature and events**, such as exhibitions and reviews, on the artwork record page. This feature is established in some examples of archival interfaces and will meet some of the needs expressed in user stories.



## Metadata clustering

Within the context of the linked data database, it is also straightforward to implement. The richer the metadata provided on the record-level page, the greater the need for this data to be visually organised, so users can navigate through it and pick up only the data they are interested in quickly. This is where the concept of **metadata clustering** can be useful in meeting user needs around granular access to data. The features



## Metadata in collapsible element

where metadata is presented in **collapsible elements or sidepanels** were not directly referenced by users in the user stories that came out of the user research, nevertheless these features are well-established interaction patterns already in use in archival interfaces and they can be useful in implementing the concept of metadata clustering as well. Connected to the question of how



## Metadata in collapsed sidepanel

much metadata is available per each artwork record and how that is made visible to users is the question of how to represent incomplete or "less rich" records without compromising the reliability of the archive and the user's trust in the archive. The approach to use visual **metadata "richness" indicators** in some collection interfaces is a useful interaction pattern in such cases. A clear indicator tool will respond to the user requirement for representing as much data as possible, even if that may sometimes be deemed incomplete or not properly referenced by the standards of the internal staff at the organisation. Finally, the



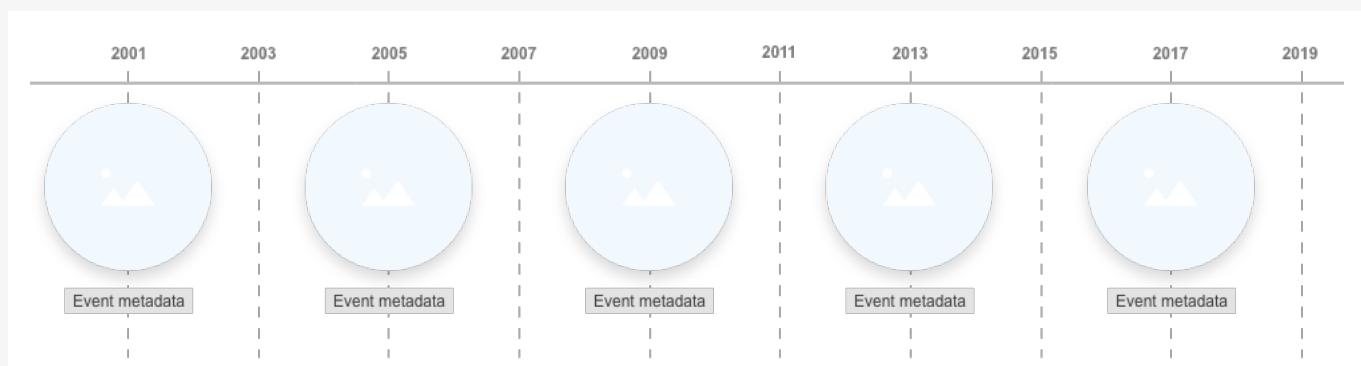
## Metadata richness indicator

concept of the **access statement**, which has been implemented to some extent in existing interfaces, will need to be developed even further in order to serve the needs of ArtBase users and their concern around access to different versions of the artworks present in the archive expressed in the user stories. An access statement will be a crucial feature of the re-designed ArtBase and it will have to address questions around functional state and version origin, as opposed to simply stating whether an artwork is "on display" or not.

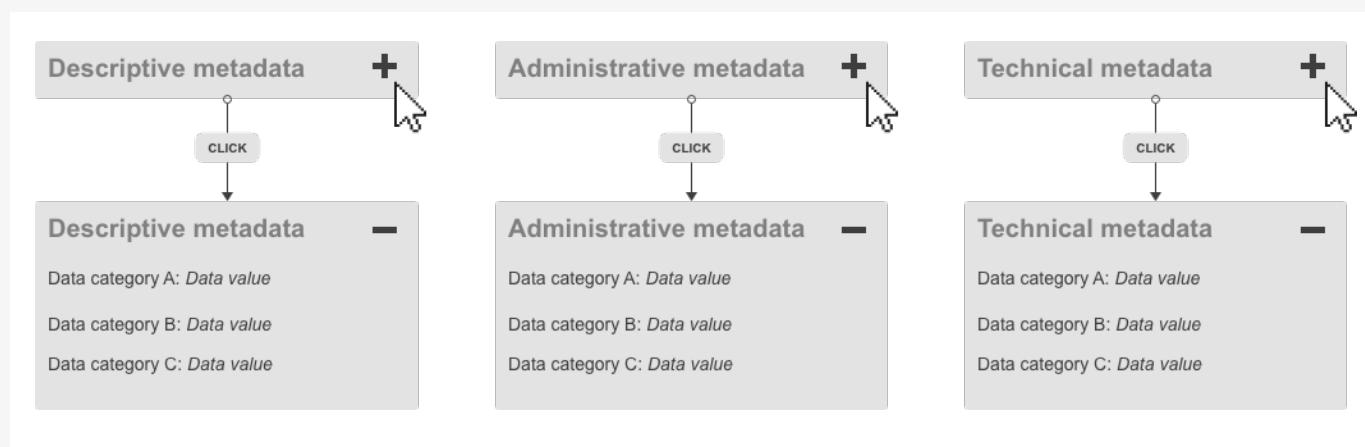


## Access statement

# Wireframe mock-ups



Single-object timeline



Metadata clustering / Metadata in collapsible element



Metadata richness indicator

Access statement



# Recommended features



## Emulated environments

Features related to net art presentation



## Rich context



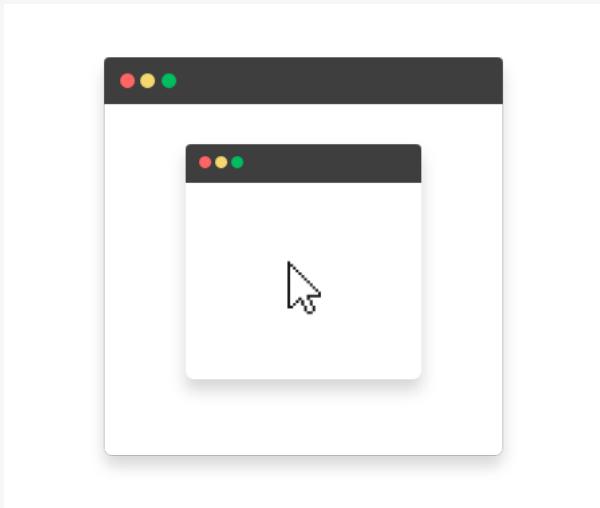
## Overlay state for contextual information



## Browser frame included in previews

Because the ArtBase will not only be an archival repository for metadata, but rather an archive which also enables its users to access functional versions of the artworks, the re-design will have to consider interaction patterns related to exhibiting net art online. The primary user story that came up in the user research phase in connection to net art presentation was the users' appreciation of the access to **emulated environments** which was facilitated in Rhizome's Net Art Anthology exhibition. Users universally enjoyed interacting with the emulators and experiencing the artworks in such a historicised context. The only other comments that users made were in relation to the additional context (usually in the form of text) provided alongside the artwork re-performance. The concept of "**rich context**" alongside an artwork presentation is a feature that is only partially present in other examples of exhibition interfaces reviewed in this report, but nevertheless can facilitate user requirements reflected across a few user stories. The question of how that context is presented in the interface remains open. One possible interaction pattern to consider in this regard is the **overlay state for contextual information**, which is well established in existing interfaces, and provides some of the benefits associated with collapsible elements or sidebars in terms of facilitating a granular approach to data presentation. Finally, while the matter of representing net art in the form of screenshot images was not picked up by users in the user stories, it is an open question for the interface, which needs to feature previews and overviews of the collection. One visual paradigm adopted only in two of the exhibition examples here, is nevertheless a useful cue to consider – **including the browser frame** in thumbnail or static screenshot representations of net art works provides visual representation of a specific temporal context, which has emerged as an important element in multiple user stories. Furthermore, in many instances the specificity of the browser is integral to the user experience of the artwork, and could be argued that the browser is not just a frame for the artwork, but a critical part of it as well, hence the need to include the browser in screenshots of the artwork, rather than cut it out.

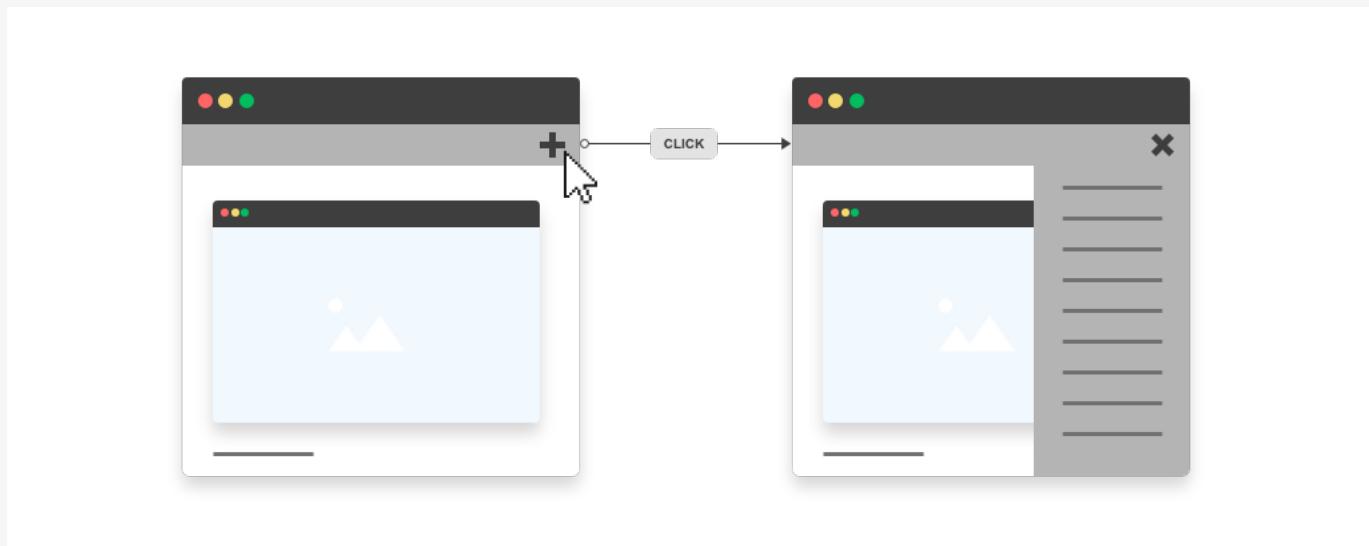
# Wireframe mock-ups



Emulated environments



Browser frame included in previews



Overlay state for contextual information

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