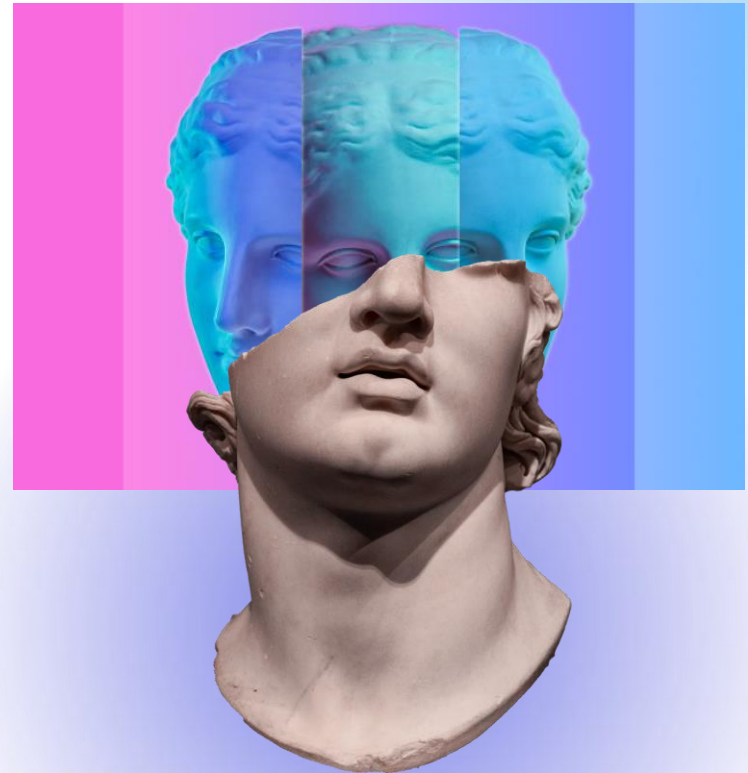


The museum as a site for critical technology discourse

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Hello

My name is Oonagh, I am a senior lecturer, writer and consultant working at the intersection of the visual arts, technology and audience development. I am based at the Institute for Creative and Cultural Entrepreneurship at Goldsmiths, University of London.

My research and teaching falls under the umbrella of critical praxis it links theory and practice to affect positive change in the cultural sector, with a focus on digital innovation, data and AI.



Met police to use facial recognition software at Notting Hill carnival

Civil liberties groups say plan to scan faces of thousands of revellers at London event has no basis in law and is discriminatory



Ghostwriter's 'Heart on My Sleeve,' the AI-Generated Song Mimicking Drake and the Weeknd, Submitted for Grammys

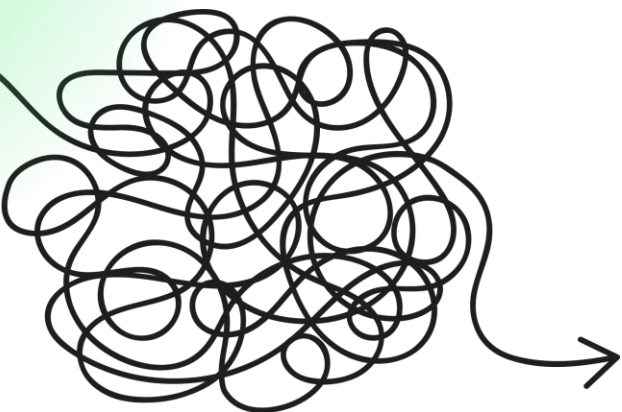
By Ethan Shanfeld



AI song featuring fake Drake and Weeknd vocals pulled from streaming services

The song, called Heart on My Sleeve, has been removed from TikTok, Spotify and YouTube for 'infringing content created with generative AI'





Can museums help us to unravel this complex technology?

Museums are the original data set





Systematic Observation

**Sharon
McDonald**

Macdonald, S., 2006. A companion to museum studies. Malden, MA: Blackwell Pub., pp.81-97.

'During the seventeenth century.... The systematic observation and comparison of objects became a key feature of natural science; and the cabinet and museum maintained and even strengthened their role as principal means of bringing together and organizing objects in order to attempt to map the world's patterns.' (p. 84)

"collecting and organizing ... can be a means of making sense and gaining knowledge of the world. Removing objects from their pre-existing worlds of use and arranging them in designated space allowed meaning and order to be discerned in the unruly and teeming world of things.' (p. 85)

ENGLAND

1949.9.61. Very fine Kashmir shawl with black centre and red ground in border, the whole covered with multi-coloured designs, large square spot motives filling the black centre. 5'4" x 5'8" (warp measure given first). 1840-60.

d. d. Miss M.F. Irvine.

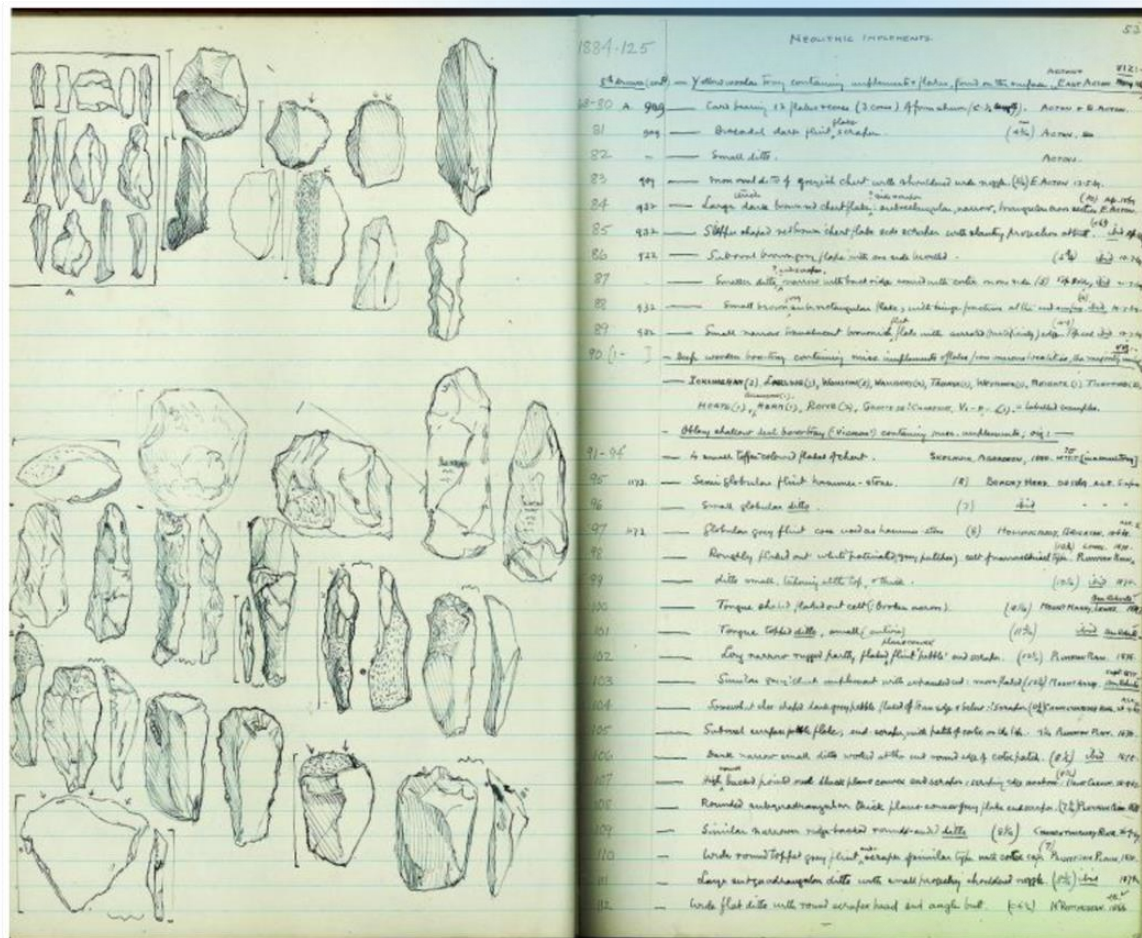
1884.101.72

| GROUP | DIVISION |
|-------|----------|
| CLASS | NUMBER |

DESCRIPTION OLD ENGLISH pipe bowl of carved wood with iron lining. The bowl is carved with 3 faces - one in front & one on each side. A shaped & up-turned stem piece is connected with the bowl part in two places, the upper one being the main, tubular, connection. The bowl is split down the front & the lining much rusted. Colour brown. Bowl height c. 0.1 cm; outer width of rim c. 3.2 cm * & back as well



| PEOPLE | LOCALITY |
|--------------|--------------|
| COLLECTED BY | NATIVE NAME |
| | HOW ACQUIRED |
| OLD ENGLISH | |
| | |
| | P.R. coll. |







The term **critical technology discourse** provides a theoretical framework from which to examine how cultural organisations critically engage with technology, **the language we use to explain and discuss these technologies** and through public programs and contemporary collecting to develop the digital literacy of visitors

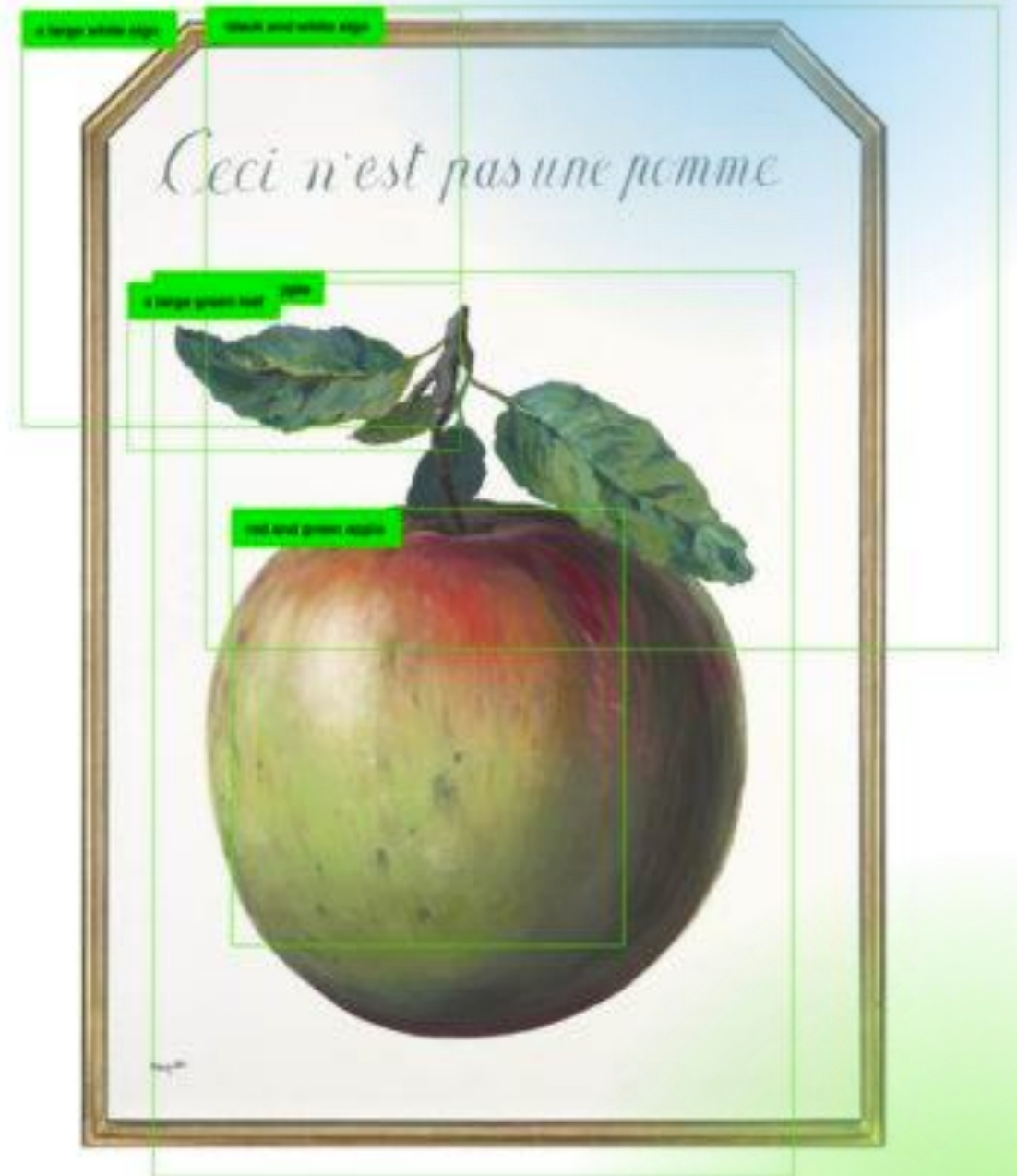
(Murphy and Villaespesa 2020).

Trevor Paglan

2019

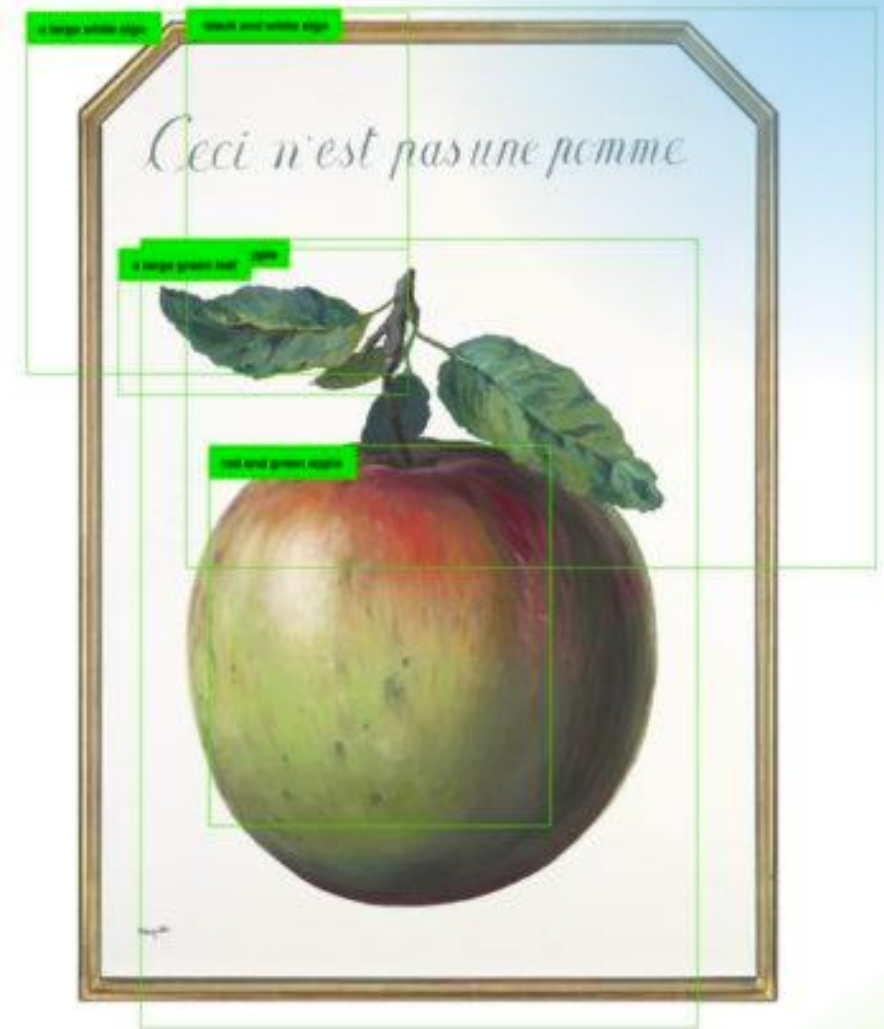
From 'Apple' to 'Anomaly'
Barbican

Elena Villaespesa & Oonagh Murphy (2021)
This is not an apple! Benefits and challenges
of applying computer vision to museum
collections, *Museum Management and
Curatorship*, 36:4, 362-383,



Trevor Paglen

A reproduction of Magritte's 1964 painting entitled *This Is Not an Apple*, the work by Magritte is a painting of an apple, with the words *Ceci n'est pas une pomme* – this is not an apple – painted across the top of the painting. Paglen has added an additional layer to the photographic reproduction of this painting, and included the categories, or tags that the machine vision training set, ImageNet applied to the painting when it was analyzed by its algorithm.



2019

From 'Apple' to 'Anomaly'
Barbican

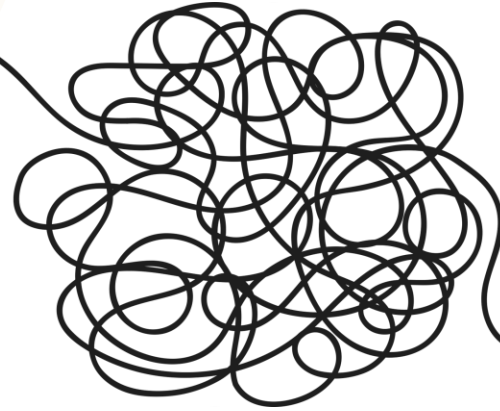
Trevor Paglen

If we walk through the process of seeing in this example, we can begin to understand where the tensions lie in the application of computer vision technologies, or algorithmic ways of seeing.

The machine sees an apple, on first look, the human eye sees an apple, the artist tells us it is not an apple. It's complicated, however, the human viewer can engage with this work as a surrealist provocation, the computer (or more specifically algorithm) struggles to 'see' beyond the literal, it is an apple, nothing more, nothing less.



Ambiguity creates fear ○



Critical technology
discourse can provide
hope, aspiration,
solutions, and crucially
digital literacy

Ethics

Bias

Racial Inequity

Classification

Taxonomies

Power

Education

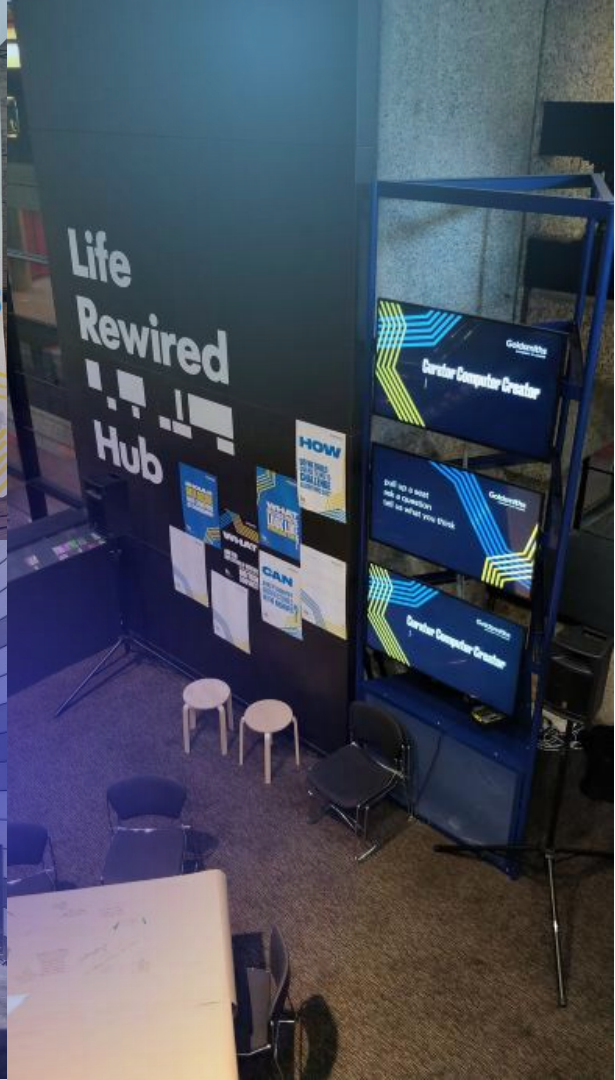
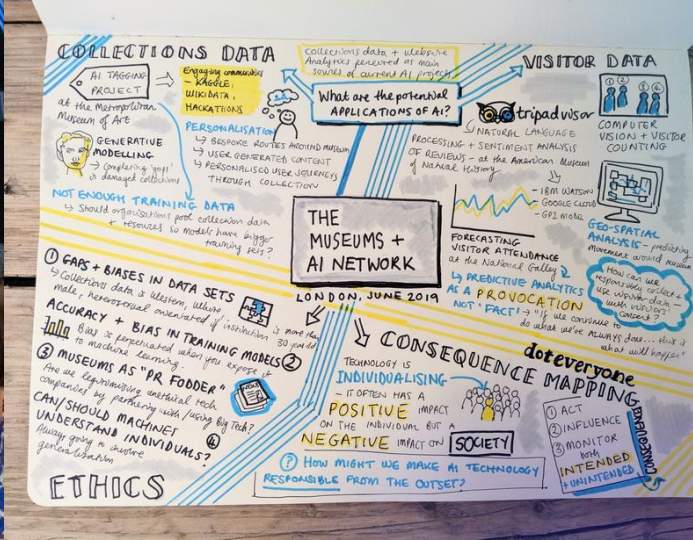
Literacy

MDH

Ownership

Restitution

Climate Crisis



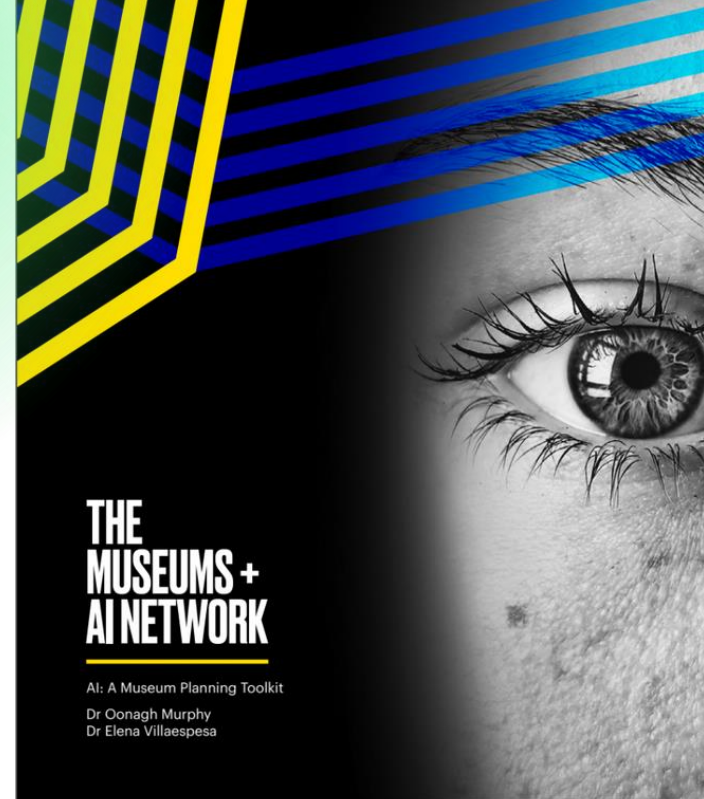
THE MUSEUMS + AI NETWORK

Developing the conversation around AI, ethics and museums





<https://themuseumsai.network>



THE MUSEUMS + AI NETWORK

AI: A Museum Planning Toolkit
 Dr Oonagh Murphy
 Dr Elena Villaespesa



Zentrum für Kunst und Medientechnologie Karlsruhe

Ludwig Forum
 für Internationale Kunst
 Aachen



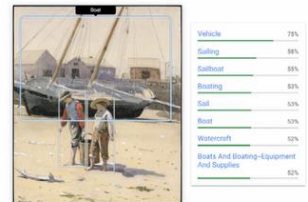
MUSEO NACIONAL DEL PRADO

CASE STUDY

THE METROPOLITAN MUSEUM OF ART (US)

The Metropolitan Museum of Art opened for the first time to the public at its current site at Fifth Avenue and 82nd Street (New York) in 1880. It expanded to The Met Cloister in 1938 and The Met East in 2016. The museum hosts approximately 7 million visitors annually. The museum currently contains more than 450,000 digitized records—and is growing in number with each passing week. Major collections belonging to the museum include American paintings and sculpture, European paintings, Egyptian art, arms and armor, the art of Africa, Oceania, and the Americas, ancient Near Eastern art, Asian art, costume, drawings and prints, European sculpture and decorative arts, Greek and Roman art, Islamic art, medieval art, modern and contemporary art, musical instruments, photographs, and the Robert Lehman Collection.

Providing access to the Collection
 With such a large and diverse collection, an ongoing challenge faced by staff at the Met is developing new ways to document, and interpret the museum's collection in a way that will allow it to become searchable and browsable



Above: Screenshot of what the machine saw when it looked at a painting from the collection.

Useful links

- <http://www.metmuseum.org/blog/new-in-the-met2018met-microsoft-ml-explores-art-open-access-ai-what-next>
- <http://www.metmuseum.org/blog/how-at-the-met2018wikipedia-art-and-ai>
- <http://www.metmuseum.org/blog/how-at-the-met2018artificial-intelligence-machine-learning-art-authorship>
- <http://cloud.google.com/blog/products/ai/ml-when-art-meets-big-data-analyzing-20000-items-from-the-met-collection-in-bigquery>

Artificial intelligence featured in this case study: Machine Vision
 There are significant challenges in the process of developing tags both manually or automatically with computer vision. The first challenge is imperfect training data which produces issues around subjectivity of the tags added, completeness of all the potential objects and items to be tagged, accuracy and relevance. There is not enough data within the collection itself to train the algorithm, as this normally requires thousands of records. In the case of the Met, more than half of the tags have less than 1000 occurrences, as such working with vendors and off the shelf systems has been crucial for this work to develop.

Another significant challenge is the implementation of the tags both into the collection management system and on the website user interface. Developer resources are needed to bring these keywords to the users so they can be searchable and clickable on the online collection.
What can we learn from this case study?
 AI has a lot of potential for making art more accessible to the public. Computer vision has come a long way and continues to improve making the enormous task of tagging museum collections a relatively simple process. However, museum collections are inherently biased and there are no right answers for tagging art. Therefore, museums need to offer a way of signifying the user that the tags have been generated by a machine with all the implications that this process brings. While museum datasets are not complete enough to train algorithms potentially museums could work together to produce an algorithm that could be applied in the sector. There is also an opportunity for museums to partner with the data science community to create machine learning models based on smaller datasets specifically for art objects.

WORKSHEET

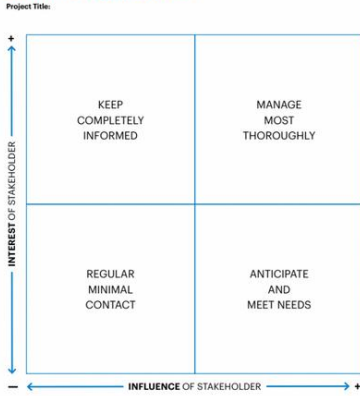
STAKEHOLDERS MANAGEMENT

All projects involve many different partners, and it can be useful to map these partners or stakeholders at the project development stage. The goal of this worksheet is to think about everyone involved, interested and influential for your project. We suggest listing each person on an individual post-it note.

- Criteria:**
- Who will benefit from this AI initiative?
 - Which internal stakeholders will need to support and contribute to the initiative in order to implement it? Are there any specific areas of resistance within the museum?
 - Who owns and manages the data that will be used?
 - Who in the museum leadership would need to know about this AI initiative?
 - Are there any external stakeholders that will participate in this project or whose conflict of interest may appear?
 - Who would you need to involve to ensure data privacy and ethical practices for this AI initiative?

When you have listed all stakeholders, as a group discuss where they sit within the stakeholder mapping grid, and from there think about when and how you will communicate with each stakeholder.

STAKEHOLDERS MAP: WHO NEEDS WHAT?



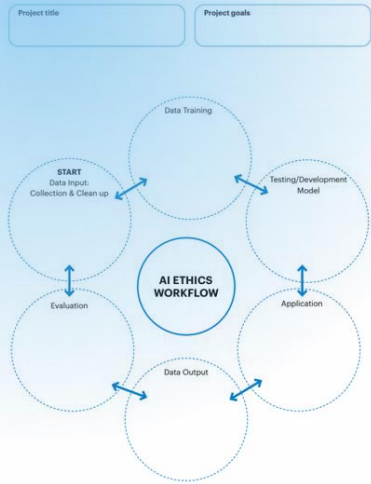
Adapted from Mendelow (1991)

WORKSHEET

AI ETHICS WORKFLOW

AI brings a set of ethical implications and algorithm biases in each step of the initiative life cycle. The goal of this worksheet is to map the potential ethical issues and challenges that arise in each of the phases of an AI initiative from the data collection to the training, application and evaluation of the results. Here are some questions to guide your discussions:

- Data Input: Collection & Clean up**
- Is there bias already in the original dataset? What data is not represented?
 - What is the process to clean up the data?
 - Has informed consent been gathered for this data?
 - Is there any personal information?
 - What are the museum processes to store and keep this data secure?
 - Does the museum comply with the legal data privacy requirements?
- Data training**
- Do museum collections serve as valid training datasets?
 - Is there enough data? What data is missing?
 - Can we train a machine to see like a curator? What are the benefits and drawbacks of using machines?
- Testing/Model development**
- What are the potential biases that these algorithms originate?
 - What are the ethical implications of using third-party AI platforms to develop our model?
 - Is there transparency in the model development process or is it a 'black box'?
- Application**
- How will the 'black box' alter curatorial practice?
 - What are the intended and unintended consequences of the application of this model?
- Data output**
- Is there a potential bias in the data output?
 - Can the process be documented and explained to users?
 - What are the legacy and future applications of this data?
- Evaluation**
- How does the museum evaluate the success of this AI initiative?
 - What is the impact on the visitor experience?
 - How does this work enhance and expand the collection data?
 - How do the results of this project comply with the code of ethics of the different museum associations?



WORKSHEET

AI CAPABILITIES FRAMEWORK

An AI project requires resources and skills to gather, train and implement the data results. The goal of this worksheet is to discuss each of the following aspects of the capabilities needed to undertake this AI initiative.

- Data**
- What is the data that will be used for this AI initiative?
 - How should the museum be prepared in terms of data infrastructure and governance?
 - Is there an ethics committee in place at the museum to assess and oversee the compliance of this project?
- Tools**
- What are the AI methods and tools that would be employed?
 - Would the museum use any external tools from technology companies?
 - Are there open-source tools available for this AI project?
- Resources**
- What are the required resources? (Human, Financial, External Collaborations, Technological)
 - What is the project legacy? What is the technical debt that needs to be considered?
- Skills**
- What are the skills museum staff need to work on this project?
- Organization**
- Which museum departments need to be involved?
 - What is the ideal workflow and process to implement this AI initiative?
 - Is the museum's organizational culture ready for this initiative?
- Stakeholders**
- What internal and external stakeholders would be invested in this project?
 - How do you manage and communicate with the stakeholders?
 - How do you foster early concept buy-in?





Sheets home

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A1 fx #

| | C | D | E | F | G | |
|----|---|--|----------------------|---|------|---|
| 1 | Project title | Description | AI technology | Data | Date | Links and reference |
| 2 | Analysis of TripAdvisor comments | British Museum is expanding its visitor feedback analysis to data acquired by TripAdvisor reviews, comments, and ratings. Using ML, they are able to understand the frequency of certain words/topics in reviews, and correlate various features (words/topics) to discover and understand patterns between visitor features and comment features. | Sentiment analysis | TripAdvisor reviews | 2018 | https://medium.com/mcring-from-trip-advisor-re |
| 3 | Kaggle competition iMet | Competition on Kaggle using the Met's dataset | Computer vision | Collection | 2019 | https://www.kaggle.com/http://artexplorer.azurevhttps://www.clevelandahttps://www.microsoft.c |
| 4 | Art Explorer | Enhancing the metadata in the collection using AI algorithms powered by Cognitive Search | Computer vision | Collection | 2019 | http://artexplorer.azurevhttps://www.clevelandahttps://www.microsoft.c |
| 5 | After dark | Robots deployed after hours/at night in the Tate museum; visitors are able to remotely control the movement of a robot, which moves around the darkened galleries and illuminating works on display | Robots | | 2014 | https://afterdark.io/ |
| 6 | Analysis of TripAdvisor and survey comments | Usage of sentiment analysis (NPL) to analyze survey responses and TripAdvisor comments | Sentiment analysis | TripAdvisor reviews and satisfaction survey responses | 2018 | https://medium.com/@Cnce-museums-and-feeli |
| 7 | Pepper | Smithsonian is using humanoid Pepper robots called "Pepper" to translate Kiswahilli phrases in an exhibition for the National Museum of African Art, as well as orient visitors to a specific exhibition in the National Museum of AA History and culture. These Pepper robots are intended to sense when visitors are nearby, and engage them in conversation, assist with translation, answer logistical and common questions (where is the bathroom,etc), and in other educational spaces Pepper will be used to teach coding and software engineering. | Robots | | 2018 | https://www.si.edu/visithttps://www.si.edu/newches-pilot-program-peg |
| 8 | Predictive analytics for visitation | The National Gallery (UK) using AI technology to analyze past visitor attendance data to predict exhibition visitor numbers. NG combined its own visitor attendance data with wifi data, website visits, and various open sources (such as a tourism figures) to model its data and create predictions | Predictive analytics | Attendance figures | 2017 | https://www.computerv-uses-predictive-analytihttps://www.digitalmee/gallery-predicts-the-fut |
| 9 | Send me SFMOMA | SFMOMA developed a chatbot triggered by a text to a 5 digit number using the text "send me" and a keyword chosen by participant based on interest or curiosity. Using the SFMOMA's API, the chatbot responds with an artwork from the entire SFMOMA collection that corresponds to the keyword, allowing visitors to receive a work of art not on view, somewhat randomized but relevant to their expressed interest. | Chatbot | Collection | 2017 | https://www.museweb.ror-opportunity-%E2%8https://www.sfmoma.or |
| 10 | | Similar to the Pepper chatbot, the Akron Museum developed Dot, a robotic tourguide that shares information | | | | https://akronartmuseumaunch-party/12829 |

THINKING ABOUT AI

Why AI?

Just because it's legal doesn't mean it's ethical!

Off the shelf tools

Quality Assurance or Human Augmentation

Bias management

Brandwashing

Critical Technology Discourse

Museums can provide a valuable platform for critical technology discourse. They can be brave, curious, advocates for art that asks questions and challenges power. Museums are places where culture is made not just stored. Museum shape people's world views and in doing so they shape worlds. Museums could claim a space in the growing public debate about AI and shape public policy, rather than simply react to it.

Thank you

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