**The Museums + AI Network**
London Working Group 26-27 June 2019
Goldsmiths, University of London

**Day 1**

Framing AI in a museum context
Introductory talk by Oonagh Murphy, Elena Villaespesa

The two-day working group in London kick-started with Oonagh and Elena, network co-founders introducing the Museums + AI Network and the focus of its first working group in London. Oonagh and Elena invited participants, museum professionals and researchers working on AI, to discuss projects, identify common challenges and share tools.

The programme and the structure of the London working group was developed around two main areas of research interest: firstly, applications of AI technology in collecting visitor data that help to understand visitors and improve their experience in the museum; and secondly, the ways with which machine learning offers opportunities to research vast museum collections.

What was highlighted during this introductory talk is that the new possibilities that AI presents new possibilities but also a new set of ethical implications. Such ethical concerns include issues such as biases and questions around how and why data is collected. At the same time, this new technology requires new skills, expertise, and partnerships.

Developing ethical practice in museums – Workshop led by Rachel Coldicutt, Doteveryone

*"What are the ethical challenges for museums and AI?"*

This two-hour workshop led by Doteveryone's CEO Rachel Coldicutt was dedicated to exploring and understanding the ethical responsibilities of AI in the museum sector.

Rachel identified a crucial ethical challenge that appears when using platform technologies for engagement; a need for transparency about where data is going, how it is used and processed, and what kind of digital platforms are needed for each purpose.

Furthermore, Rachel emphasized that datasets contain gaps and biases. Biases can appear both with assumptions that museums make about their visitors, but also in the process of researching, interpreting and cataloguing their collections. As such, there is an ultimate ethical responsibility and urgency to develop tools that are able to identify and address the biases that are hidden in the algorithm.

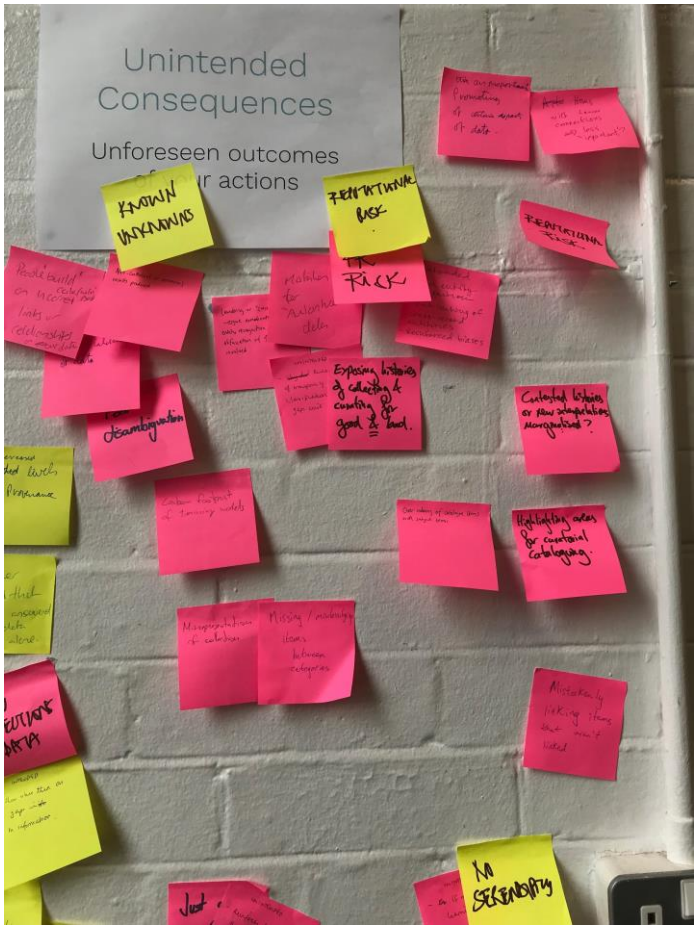
Rachel also mentioned that developing such tools can help in increasing the levels of trust between museums and the public. This becomes even more apparent considering how public space (and as such museums as public spaces) are the most governed areas of society.

During the workshop, participants were split into two groups of 14 members each. The teams were invited to choose and work with a specific case study.

One group focused on machine learning and entity recognition in the Wellcome Collection. Entity recognition is a technique that allows users to extract patterns and information from a vast collection of data. A crucial question that appeared here is: What problems occur when data becomes bigger and what could be some possible ways to govern this data?

The second group worked on a case study from the National Gallery and their usage of AI in forecasting visitor attendance and identifying the future audience. Forecasting models help museums to understand visitor behaviours, improve their overall experience, and identify possible areas to increase revenues. One interesting response that appeared here is the proposition to keep prediction at the level of provocation and to always take into consideration the many, and in some cases unpredictable factors, that affect attendance.

The intended and unintended consequences that could appear in the above implementation of AI were mapped in the form of post-it notes.

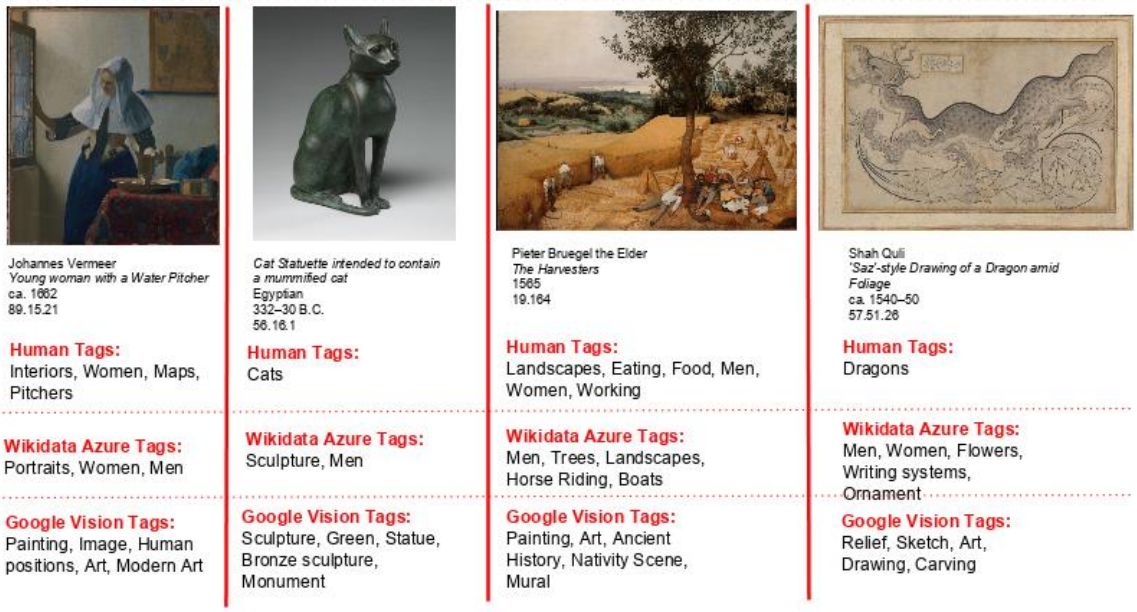



Session 1: Ways of seeing

This session included ten-minute presentations by museum professionals and researchers who were invited to share insights related to their current or recent projects and address some issues that appeared while working on AI projects.

**Jennie Choi**, General Manager of Collection Information in the Digital Department of the Metropolitan Museum of Art, New York, discussed AI and image tagging. She mentioned that working with AI technology in tagging can increase user engagement and improve search and discovery of the collection making it more accessible to a wider audience.

*"Can museums work together to create a common computer vision model?"*




Jennie stated the above question after mentioning some of the challenges that occur when working with tagging projects, for example the lack of developer resources, not sufficient data training, and biases in answers for tagging art.

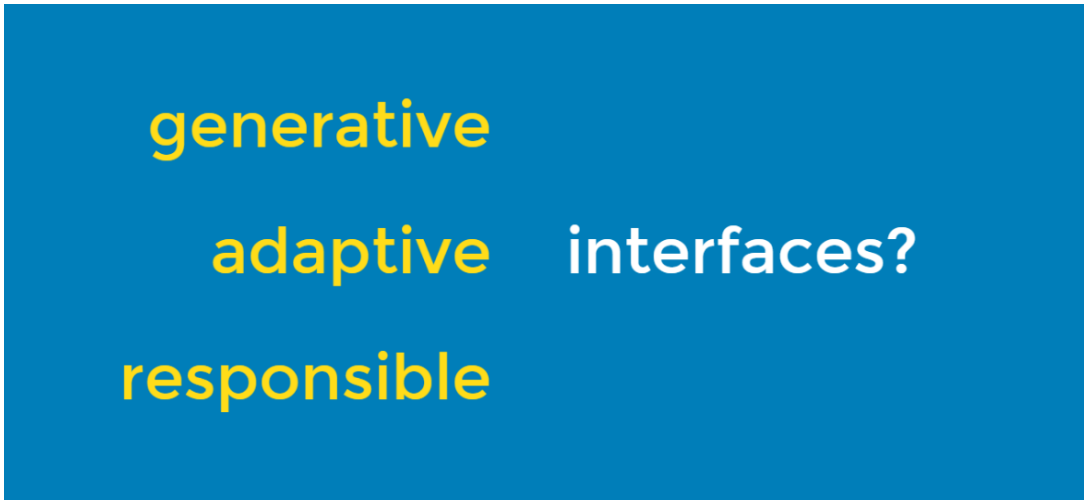
**Harrison Pim**, from the Wellcome Collection, shifted the conversation towards AI technology that is used in creating colour palettes, knowledge graphs and explorations of texts related to collections. Harrison expressed a timely provocation question to highlight the need for developing more democratic diagnostic tools in order to deal with biases in cataloguing and researching collections:

*"If my printer can create a masterpiece, why can't I? If my laptop can call out racist, sexist, or biased canon interpretation, why can't I?"*

Harrison emphasized the need for more collaborations between curators, cataloguers and data scientists in order to build critical strategies for addressing and dealing with such issues.

**Philo van Kemenade,** founding curator of the Sensorium Festival and member of the Unfold Collective, shared with the group his experience on digitising collections at the Slovak National Gallery. He proposed to think of museum collections as data. Philo raised the question of what it entails to develop a more ethical AI in the GLAM sector (Galleries, Libraries Archives, Museums):

*"How can GLAM support a virtuous circle towards more accessible and responsible AI?"*




In responding to this question, Philo mentioned that "classification machines look very different at us than the way we look at ourselves" and as such, developing AI technology that could be generative, adaptive, and responsible is currently more urgent than ever.

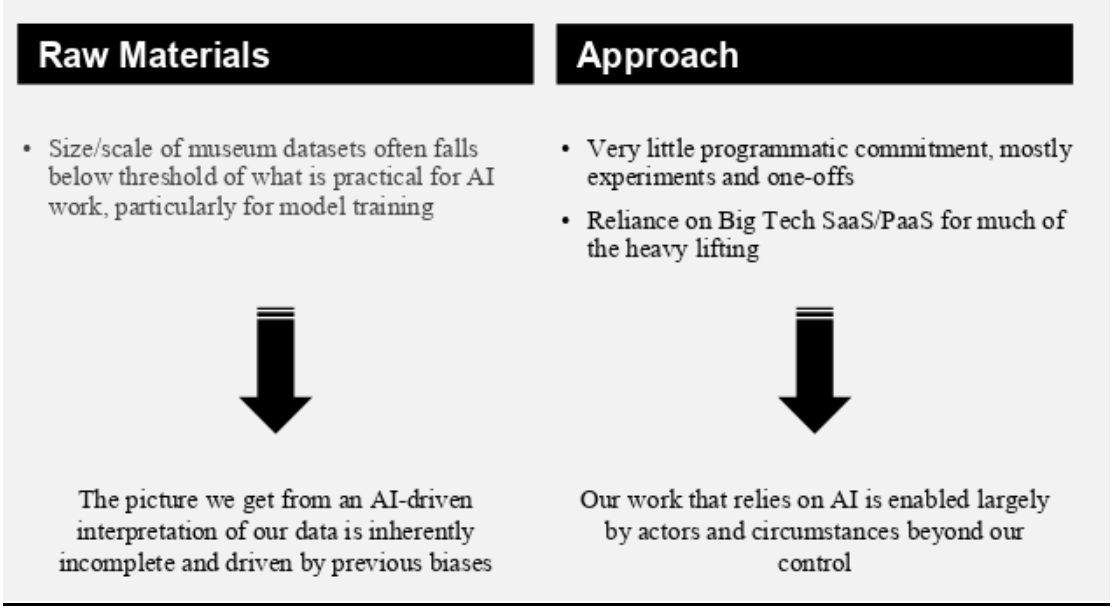
**Giles Bergel**, from the department of Engineering Science at Oxford University, emphasized the impact of collaborations between technology research groups and museums. Building such collaborations could be especially fruitful in bringing technology outside of computer science disciplines and this could be particularly helpful in museums as they have large collections of images with which computer vision research groups could engage further.

According to Giles, cultural heritage datasets are visually rich, challenging, and intensively and critically curated. This directly leads to the question:

*"How should training data be curated and critiqued?"*

Continuing the conversation on computer vision, **Dan Brennan**, from Princeton University Art Museum, mentioned that computer vision can be implemented in collections for enabling object, scene, text, and facial recognition, it can be integrated into existing data pipeline and its results could be exposed as data and image annotations. Dan pointed out that AI technology, such as natural language processing appears to be useful in producing catalogue essays, wall labels or sentiment analysis.

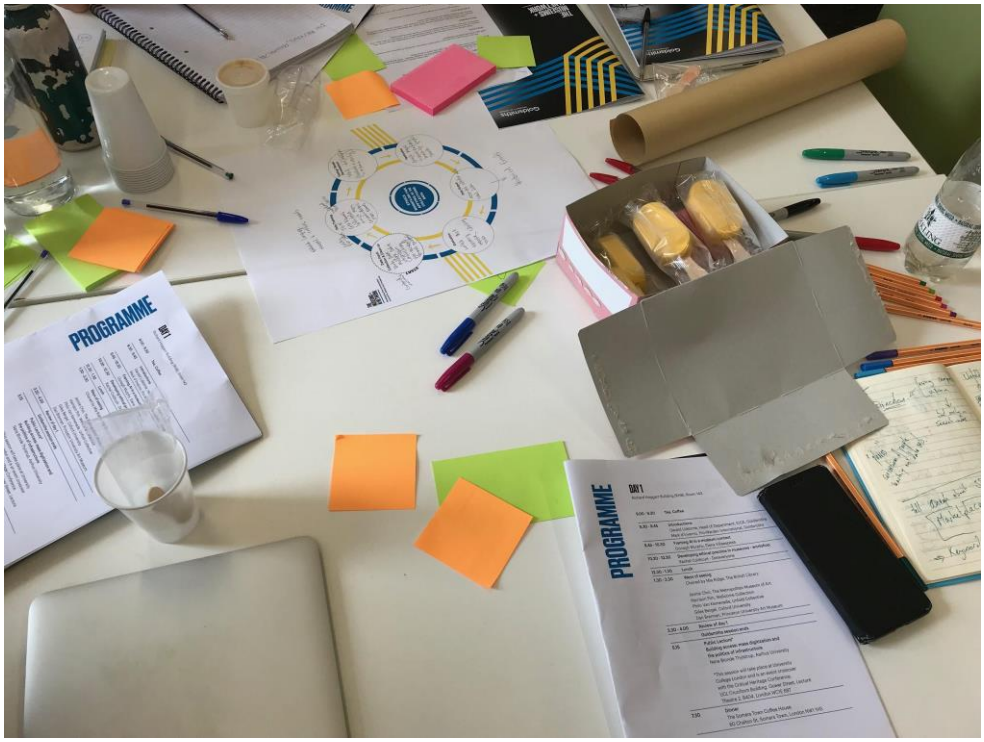
*"How can we, as a museum, craft AI-based collection data initiatives that extend our approach to teaching with collections while not perpetuating existing biases in our datasets?"*




To sum up, all contributions in the sessions highlighted that there could be gaps and biases hidden in data sets and as such there is an intense need for new tools and trainings to be developed. This becomes more challenging when thinking about how biases are reproduced and driven by previous biases that are already inscribed with the machine learning process. At the same time, work that relies on AI is affected by circumstances and factors (policies and regulations) that go beyond the control of the data scientist.

Ethics Workflow – Workshop led by Oonagh Murphy and Elena Villaespesa

The first day at Goldsmiths finished with the Ethics Workflow workshop. Oonagh and Elena worked with the participants in developing an ethics tool for applying AI to data collections. Participants collaborated in teams and were invited to think about ethics as an applied set of actions that expanded across all stages of data training, testing/model development, application, data output, evaluation, and data input. These worksheets will be revised and published in autumn 2019.




**Day 2**

Insights from Arts Council England – Tonya Nelson, Director of Arts Technology and Innovation, Arts Council England

The second day of the Museums + AI working group started with a talk by Tonya Nelson who shared insights from Arts Council England and their strategies in supporting technology and artificial intelligence within the cultural sector.

*"A collaborative approach to culture helps towns, villages and cities across the country thrive".*

An interesting remark that came out during the conversation is that innovation is difficult to be implemented in real context as it requires long-term changes in policies and a shift in mind-sets. Smaller organisations are more prone to experiment with new ideas and this makes them to pick up innovation more quickly than larger museums. As such, collaborations across institutions, learning from other disciplines and creating structures to exchange expertise across the sectors could perhaps be a useful practice in order to expand innovation and implementations of AI in the broader cultural sector.

Locating the Visitor – Part 1

The first session of Locating the Visitor included presentations by **Fiona Johnstone**, Research Fellow, at the University of Warwick on the project People Like You, and **Vishal Kumar**, from The Bartlett, University College London. The session was chaired by **Lawrence Chiles**, Head of Digital Services at The National Gallery, London.

The session was specifically focused on facial recognition, machine vision and algorithmic personalisation. Fiona addressed with her presentation the issue of personalisation identifying three techniques of algorithmic personalisation: tracking, sorting/classifying and contextualising. On a similar note, Vishal expanded further on the different usages of personification and machine vision.

Machine vision could be very helpful in producing sentiment analysis, recognising similarity in patterns and compositions in museum items, and explore new ways to research collections and to make them available to the public. However, when this is applied to visitors there are ethical concerns raised.

A crucial question that appeared in this session was:

*"What are the tensions between a person-centered museum practice, and the use of machine learning algorithms to generate 'personalised' content or experience?"*

Reflecting on this critical question, the group conversation opened different avenues for thinking how and if museums should embrace AI technology to personalise the visitor experience. Taking into consideration visitor needs and customising museum programmes and events according to these needs, transforms a visitor into an active and "co-equal partner in the venture of making a meaningful experience" (Rodney, 2019), however, as participants mentioned in this session, the methods used in collecting data for producing visitor-tailored experiences have to be open and transparent.

Locating the Visitor – Part 2

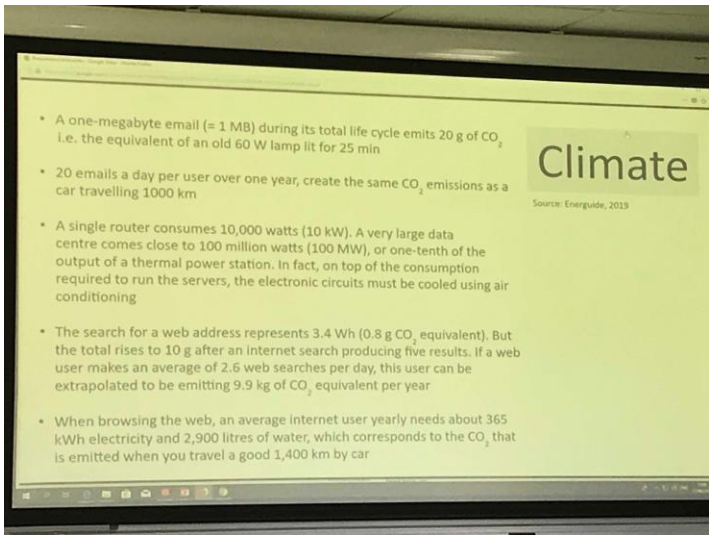
The second session of Locating the Visitor was developed with short presentations by **Ariana French**, Director of Digital Technology at the American Museum of Natural History, **Cassey Scott-Songin**, Senior Manager: Data and Insight at The National Gallery London, and **Hannah Barton**, Digital Project Manager at Tate. The session was chaired by **John Stack**, Digital Director at Science Museum Group.

**Ariana** discussed in her presentation the ways with which the American Museum of Natural History works with natural language processing to understand what people feel about the museum and how they interact with it based on written reviews on Trip Advisor and Google

API. In this process, sentiment analysis was produced by employing Net Promoter Score surveys as a tool to gain insights into comments submitted by the audiences.

**Cassey** spoke about the ways with which the National Gallery engages with AI to conduct predictive analytics. These forecasting models include predictions about the popularity of an exhibition. Predicting the number of visitors is important, for example in order to estimate the capacity of the galleries or to have a prior understanding the number of staff needed.

**Hannah**'s talk focused on personalisation. In addition, she pointed out in her talk that AI projects need more capacity, more staff, and relevant resources. Another crucial remark, was the realisation that AI comes also with some external consequences, for example climate and the environment.




<u>Museums and AI Capabilities – Workshop led by Oonagh Murphy and Elena Villaespesa</u>

Inviting participants to work in groups, the workshop provided a framework to detect the AI capabilities in museums. Participants were provided with a Museum and AI Capabilities worksheet which included a visual guide and a mapping of necessary tools, resources, skills and organisation needed in order to allocate certain work that involved an AI initiative. Participants had to complete the separate spaces provided in the worksheet to track down the capabilities used in museums as well as those needed to be further developed when it comes to applying AI.

Group Activity: role-play case studies – Led by Oonagh Murphy and Elena Villaespesa

The second day of the working group finished with a role-play group activity. Participants were split into groups and represented various roles in scenarios/cases where museums would respond to complaints related to the access and use of data. Responses were developed reflecting on regulations, policies and code of ethics as they are established in entities such as ICOM and the Museum Association. This was a good opportunity for participants to find out about official regulations when it comes to working with AI.