THE FUTURE OF
DIGITAL HUMANITIES

CULTURAL

HERITAGE
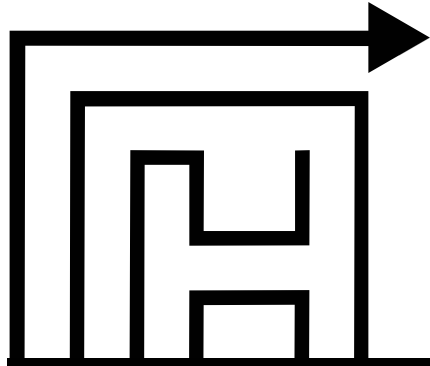
01 | INTRODUCTION

How does a possible future of Digital Humanities look like? A single open educational resource cannot answer this open question, but this text will discuss two different directions of possible futures: the use of Artificial Intelligence in the Digital Humanities research, as well as the changing role of cultural institutions as result of digitization.

01

INTRODUCTION

| ARTIFICIAL INTELLIGENCE

The Computer as Research Assistant

What trend do we think is likely to come? What development might be wishful thinking? It is always hard to do future-scoping and I don't really want to engage in forecasting. But one trend that is quite obvious right now when consulting the literature and looking into the research and creative practice is the rise of the use of artificial intelligence (AI) in Digital Humanities research and Digital Cultural Heritage.

Digital Humanities is already operating since many years with machine learning such as Natural Language Processing for automated analysis of textual data or with computer vision for image analysis such as object detection or motif detection. An example is the project iArt (https://iart.vision) that was conducted by the LMU Munich and TIB Paderborn. The researchers created an open web-platform that enables to index large amounts of image data from art history and related disciplines and makes them searchable. This is especially interesting for getting insights into large image collections and museum collections based on the visual content instead of basing the visual search on already existing annotations and classifications, as it was common practice for a long time. This is what Lev Manovich calls "thinking without categories", leaving out the preexisting human order and sorting to get new and unprecedented insights through a "computational point of view". For the search, iArt does not rely on textual metadata but rather color, texture, and shape as well as the semantic content of the images. Thus, machine learning is tasked to bridge the semantic gap between patterns within these rather simple, detectable features of an image and the semantic meaning of these patterns, which a human being would attribute to them. The computer starts to learn something about the world as humans would see and interpret it. And it will get better at it in the long run, since it keeps learning from humans. In the future scientists will be able to answer much more complex research questions with artificial intelligence than currently imaginable. For cultural heritage practitioners AI can be used to preserve and organize digital archives and collections, while making it easier for researchers to access and work with these resources. It can support cultural heritage professionals with identifying and tagging of different types of content, as well as identifying potential preservation issues.

The employment of AI is not limited to research and analysis but can also be employed in the mediation of art and culture or in creative processes. The German Research Center for Artificial Intelligence (DFKI) experimented with a voicebot as museum guide, which is able to answer questions from visitors based on structured data of a museum collection. Thus in a first step a voice-AI understands and translates the spoken language by the visitor into a machine-readable question. In a second step the system uses the collection data as knowledgebase to be mined by AI on the fly to find possible answers to the question, and translates it back through a voice AI into a spoken answer (see Deutsches Meeresmuseums, 2022). These kind of systems are still in the very beginning and are far from perfect, but will improve in the future to what could become a scalable Q&A or guiding system. The rise of chatGPT as a generative knowledge system, which starts to replace traditional search engines for specific tasks, shows that AI-technology is rapidly evolving.

However, when employing Artificial Intelligence it will be important to be aware of its strength and weaknesses and consciously decide for which tasks it should be used. The strength of computers and therewith also AI is definitely the analysis of huge amounts of data in a short time as well as finding correlations within data. So according to Manuela Lenzen (2020) researchers will use these strengths increasingly in the future and will be able to work with more inclusive samples of cultural data, as Lev Manovich also envisages in his research paradigm Cultural Analytics (Manovich, 2020). Thus hopefully we will get a much more comprehensive image about society and culture that by basing it on a more inclusive sample of cultural expressions.

However, what AI does not do that well is the development of theories about the world and life, as they lack the experience inside the world. Thus, it is important for researchers not to exclude all previously existing theories and hypotheses and "just" let the AI crunch huge amounts of data without any direction. This would lead according to Lenzen (2020) to an aimless analysis of data. As it is a quantitative analysis there will always be some result, but AI oftentimes can't distinguish

between causalities and correlations and comes up with wrong conclusions. Therefore, the human researcher should still be in charge of conducting the research, setting the questions and interpreting the outcomes as well as deciding to employ the AI to its strength where it makes sense in the research process. In many cases the AI will give researchers and digital cultural heritage professionals a basis for their own interpretation and analysis. Thus, the AI will be a collaborator in the research process rather than a competitor of human researchers. And the role of a student or researcher will be less in the gathering of information but rather in interpreting and making sense of the results, checking for potential bias and error – thus having a critical eye on the employment of computational tools, as intelligent algorithms cannot differentiate e.g. between right or wrong information.

Another gap to be closed is the development of new theories based on automated analysis. The big question is still: what do the results researcher get from automated analysis actually mean? And how can we draw reliable conclusions about culture and society on the basis of correlations found by an artificial intelligence? In my opinion, current research about AI is only at the very beginning to reliably interpret the resulting data. This needs to and will evolve over time. Theory building needs to happen with and on the basis of computational analysis. But moreover so, it will be important to gain a better understanding of what happens inside the blackbox and the "hidden layers" of an AI. These will be for sure topics of future research.

Where "[T]he original vision of AI was about automation of cognition. Today, AI also plays a crucial role in culture, increasingly influencing our choices, behaviors, and imaginations. For example, it is used to recommend photos, videos, music, and other media. AI is also used to suggest people we should follow on social networks, to automatically beautify selfies and edit user photos to fit the norms of ,good' photography, and to generate and control characters in computer games," as Lev Manovich writes (Manovich, 2021). And as Emanuele Arielli adds, additionally to recommendation systems and automated editing Ai is by now also generating new aesthetic artifacts like artworks, music, design or text (see Arielli, 2021). Thus, a whole new aesthetic field and new production methods bridging humans and machines are arising, which need to be analyzed and understood.

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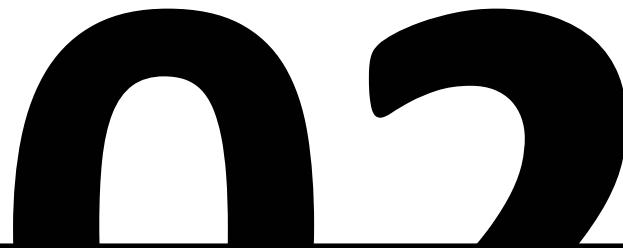
ARTIFICIAL INTELLIGENCE

| THE ROLE OF MUSEUMS

How will this digital transformation change the role of Museums?

Artificial Iintelligence specifically and digitization in general are spearheaded by innovation projects inside research institutions and industry. But they are affecting all areas of society, and with that also cultural institutions. However, digitization it is not just influencing marketing or documentation of digital heritage objects, but also mediation, learning, research, publication and even management or ticketing. As Holger Simon (2018) writes in his article about a digital ecosystem and digital transformation in cultural institutions, this development is changing and will change even more the existing job-descriptions within cultural institutions and will add new types of positions. A good example is the position of a data scientist and a digital collection management expert, that became crucial in museums. A digital curator (see OER on Digital Literacy) turns into a knowledge manager and mentor, who guides the visitors and users through the vast amount of information available, supporting them in their own exploration.

But the digitization also changes the role of museums within society. Museums turn from gatekeepers of cultural heritage, which first and foremost preserve culture, to knowledge brokers. As cultural institutions nowadays are directly competing with many open information sources on the Web, they need to adopt new digital mediation formats if they want to keep and rebuild their role as trusted source for their own collection. Such formats should make art and culture accessible independently of time and place and allow interaction and participation, sharing and reuse of cultural objects. Museums therefore will become hybrid informal learning spaces, where visitors can learn from art and culture anywhere and anytime. They will transform into "smart places", a term that according to Simon (ibid.) describes living places of digital communication where content is the most important asset and which are open to multiple perspectives from outside (see Simon, 2018). This includes inviting visitors to contribute in form of co-creative knowledge generation or citizen science, networking collections to create new contexts as well as using machine learning to get new insights or contributing to linked open data. In this area museums can learn a lot from Digital Humanities practices.

Museums will have to adopt new technologies over time and might not only have a physical presence in the world, but also inhabit virtual spaces like the upcoming metaverse as part of a holistic museum experience. A first example of a museum in the metaverse is the Francisco Carolinum in Linz, Austria, which opened a virtual branch during the pandemic and started to experiment with exhibiting in digital spaces that enable virtual co-presence of visitors. These new technologies will demand museums to constantly rethink, redefine and negotiate what it means to exhibit cultural heritage. How do we tell a story allowing multiple perspectives? How is meaning generated in the digital realm? And what role does more and more intelligent technologies play in this process? Already today it is clear that technology has become an agent in its own right within the digital mediation process and in the process of knowledge generation about art and culture (see Wiencek, 2019). And very likely it will not go away. Therefore, an important task of cultural institutions will also be to reflect and educate on what new and upcoming technologies might mean for the society and humanity at large.

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