

Artificial Intelligence in Society and Art

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Abstract: Artificial Intelligence (AI) is beginning to shape the structural conditions of those societies participating in the development of automated intelligent behavior. Mediating between forms of technological processing and objects of cultural imagination, the use of AI is affecting the processes of contemporary art as well. Based on these developments and as an expansion of the institute's own Art Science Lab at the TU Dresden, the research forum Schaufler Lab@TU Dresden has set out to explore the interconnections between artistic and academic research in the field of the discursive entanglement of AI and art as part of an interdisciplinary, university concept.

2019 and 2020 alone saw numerous art exhibitions on the topic of Artificial Intelligence (AI), including those at the Barbican Centre in London, the Museum of Applied Arts (MAK) in Vienna, the House of Electronic Arts (HeK) Basel, the Kunstverein Hannover and the M. H. de Young Museum in San Francisco. Dozens of solo shows containing, at least in part, elements coded or created with the help of AI, or actively responding to it also took place, including those by artists such as Nora Al-Badri, Refik Anadol, Sougwen Chung, Pierre Huyghe, Trevor Paglen and Hito Steyerl. Artists and exhibition spaces have thus begun to explore the potential of AI as a creative instrument, a non-human collaborator, a disruptive technique—in the sense of a radical innovation capable of replacing existing techniques—and as an object that triggers systematic critique and friction. This wave of interest is at least in part attributable to the growing role and significance of AI in society, as nearly all areas of human activity are currently being expanded technologically. Especially remarkable is the rapid increase in machine learning as a sub-discipline of AI, in which algorithms use large volumes of data to learn to solve certain problems through the extrapolation of patterns from information. Some examples of techniques that use machine learning are voice recognition, for instance on mobile telephones, spam filters, emotion or facial recognition, and also medical technology, where it helps to improve diagnostic quality, for example. As material realities are more and more frequently presented and interpreted in the form of data, this type of algorithmic pattern recognition is used increasingly to help organize societies and automate and regulate processes (cf. Nilsson 2015: 1ff.).

As in any mass of results stemming from the reproduction of standardized data sets, in this context, too, the statistics underlying these data sets produce historic and social generalizations. The reason for this, is that these data sets, related to one another in terms of content, portray a procedural intersection devoid of the particular or diverse, one that even suppresses the marginalized, and is unable to take into account social, political and cultural effects. Illustrative of this sort of marginalization is, for example, the inability of facial recognition software to perceive People of Color or the disadvantages to women inherent in automated job application processes. In addition, these algorithm-based processes remain mostly inaccessible for diverse users, since AI-inherent processes often require comprehensive know-how, take place within “black boxes” and presuppose at least an understanding of their interconnected effects (cf. Müller-Mall 2020: 19ff.). It is, therefore, important to facilitate a better understanding of the societal perceptions, structures and mechanisms of AI and to make its implications, especially when it comes to machine learning, an important topic of critical examination and political discussion in an academic, university context. In the future, other areas of AI will also play

a leading role, for instance automation (the process by which a system or process functions automatically); machine vision (the compilation and analysis of visual information); natural language processing (the processing of human language in a computer program); and robotics (a branch of mechanical engineering focused on the development and production of technical apparatuses that facilitate work).

Schaufler Lab@TU Dresden: Issues, Orientation und Structure

The majority of research into AI is driven by technology companies and, in academia, by the natural sciences. Humanists and social scientists often have a research agenda with a different focus and view AI less from a technical and more from a social perspective, pursuing the goal of better understanding the debates arising from the growing influence of AI. Artists, with the varied forms of expression at their disposal, frequently turn to critique, forms of systematic repurposing of technologies, diversification and investigation or a completely individualized view of AI. Since technological developments affect not only the transformation of material and energy, but also of information and knowledge, of consciousness and emotion, it is clear to see the necessity of broad, interdisciplinary forums for discourse and research initiatives.

The *Schaufler Lab@TU Dresden*, initiated jointly by *The Schaufler Foundation* and the TU Dresden, is an example of just this type of forum.



Schauwerk Sindelfingen (2020). Photo: The Schaufler Foundation.

The Schaufler Foundation, founded in 2005 by senator h. c. Peter Schaufler (1940–2015) continues the founder's life work of uniting entrepreneurship with scholarship, research with art, and supports a

graduate college and artist-in-residence program at the TU Dresden as part of the *Schaufler Lab@TU*. In this environment, humanist scholars, social scientists and artists explore the interplay of technology, art and scholarship working with and supported by natural scientists, technology experts and other researchers. The Lab consists of main components:

- *Schaufler Kolleg@TU Dresden* is an interdisciplinary graduate college with up to 10 doctoral positions per project phase: the research fields of the current fellows encompass didactics, history, art history, communication sciences, philosophy, political science, sociology and theology. A detailed overview of the current participants and their research topics can be found at: <https://tu-dresden.de/gsw/schauflerlab/schaufler-kolleg/teilnehmende>.
- *Schaufler Residency@TU Dresden* is an artist-in-residence program hosting a total of 3 artists, one for each project phase: thus far, artists in residence are Christian Kosmas Mayer (b.1976) from Vienna for 2020 and Anton Ginzburg (b.1974) from New York for 2021.



The *Schaufler Lab@TU Dresden* kick-off event (2020). Photo: TUD.

With the creation of this forum for dialog featuring art, humanities and social sciences, the TU Dresden aims to make a significant contribution to the inclusion of art in interdepartmental research in the German speaking world. The shared research subject is the interplay between technological innovation and changes in society and culture. In particular, the focus is on technology as a resource, as a means of dissemination and as an element of discourse. The lab's main topic for the first of three project phases is *Artificial Intelligence and Social Change* (2020-2023). This topic will be examined and explored from the perspective of the humanities, social sciences and art.

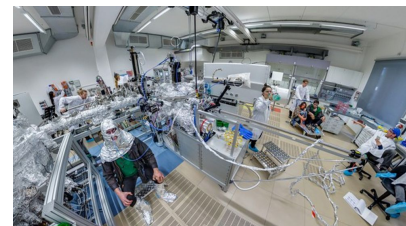
The idea for a residential program came from the *Art Science Lab* at the Office for Academic Heritage at the TU Dresden. In this lab, artists and scholars worked together on specific research questions and on topic clusters such as *Smart Materials in Art and Technology*. Participants include the artist collectives Pakui Hardware (Neringa Černiauskaitė and Ugnius Gelguda), New Scenario (Paul Barsch and Tilman Hornig), Alice Peragine, Tabita Rezaire and Young Girl Reading Group (Dorota Gawęda and Eglė Kulbokaitė), who engaged in joint projects with interested institutes and fields at the TU Dresden and conducted research on the topic Human 4.0 under the banner *Dear Humans...*. Peragine, for example, worked at the TU Dresden's Institute of Lightweight Engineering and Polymer Technology (ILK) on the effects of lightweight materials in the autonomous driving.



Alice Peragine & Xenia
Taniko Dwertmann:
DEAR HUMANS, ... (2018).
Photo: Anne-Theresa
Wittmann.



Tabita Rezaire: *Peaceful
Warrior* (2018). Photo: Paul
Barsch.



New Scenario: *Hope* (2017).
Photo: Office of Academic
Heritage/TUD.

The *Schaufler Residency@TU Dresden* established an independent format for artistic exploration. Behind its introduction lies the idea that the creative process as a cultural practice generates products analogous to those resulting from academic research, an attitude expressed as well in the *Schaufler Lab@TU Dresden*'s guiding concept:

▷ <https://tu-dresden.de/gsw/schauflerlab>

Implicit, practiced and embodied forms of knowledge are less connected to methodological requirements and are more diverse in terms of their representation. They can communicate experiences and knowledge in formats such as exhibitions, performances or public art interventions in a different, usually more individual and relational way (cf. Matzke 2013). From this fundamental position, the *Schaufler Lab@TU Dresden* aims for an understanding of how knowledge is generated that depends on its subjects—those that participate and those that are addressed—and on its context, and is not in the service of an objective truth.

By considering international, contemporary artists to be equal actors in research and education, the TU

Dresden is able to promote intersecting, mutually useful topics from the arts and sciences, to present them in a public forum and thereby support progress in the single disciplines, in art and beyond. The results of the residencies, which change yearly, are presented in various exhibition formats — from temporary installations in the open studio, to joint projects with the Academy of Fine Arts in Dresden to cumulative exhibitions. The final exhibitions always take place in the university gallery of the Office of Academic Heritage in the Görges building. In addition, one piece by each resident artist is purchased for the university's art collection.



Permanent exhibition of the university collection of the Academic Heritage Office at the TU Dresden (2020). Photo: TU Dresden.

The reciprocity between art and academic research is relevant precisely because current discussions surrounding AI are dependent to a large degree on media, such as images, text, language, etc. as learning data sets (cf. Ernst et. al. 2019: 10) . The inverse is also true, as AI is an object of media representations, their information politics and narratives. In this reflecting pool lies the connection between academics and art as they relate to this topic.

The most valuable feature of fostering this contact between resident artists and young researchers in the humanities and social sciences is that it brings their projects closer together and emphasizes the interconnections between artistic themes and academic subjects. It also makes these overlapping considerations accessible to a wider public and presents them in an array of formats. One of these open formats examined in detail the connection between cryogenics — a technique which preserves cells or tissue and sometimes entire human bodies, through freezing and liquid nitrogen — and the history of body politics, as well as the link to AI and the history of ideas. The first artist in residence, Christian Kosmas Mayer, spent his residency exploring cryogenics. He then brought the topic into the lab, took part in a public discussion about it and his project with the chair for Refrigeration, Cryogenics and Compressor Technology at the TU Dresden, Prof. Dr. Christoph Haberstroh and the college residents. The discussion format is a key component of the TU Dresden's matchmaking efforts, as the university aspires to forge interconnections among the research areas traditionally attributed to the humanities, social and natural sciences. Alongside young scholars, the artists in residence have addressed topics such as the theory of democracy, ethical perspectives on the use of drones, the historicization of AI *avant la lettre*, forms of algorithmic processes and the lack of minority representation in data sets and the limits and conditions of automated communication tools.

The residency is located in an open studio on the TU Dresden campus near the college offices and the Office of Academic Heritage. The studio also serves as a spatial interface between the college and artistic-academic research. This is where interactions take place, among artists, college fellows, the public, TU students studying STEM subjects and international and national scholars. All this personal action is made possible because of the spatial proximity of the work spaces and ateliers to the main TU Dresden campus, and because lectures, symposia, conferences and workshops on AI are held jointly. The workshop *Artificial Intelligence in Context* given by Prof. Dr. Dirk Baecker, sociologist at the Universität Witten/Herdecke, in which the role of AI within social frameworks is explored, is one example. Another is the workshop on *Drone Images* by the image and media scholar Dr. Michael Richardson from the University of New South Wales, Sydney, Australia, which examines ethical perspectives on AI in terms of synthetic imaging.

Members of the excellence cluster at the TU Dresden are key partners. The first project phase featured cooperation with the *Center for Tactile Internet*, the *Center for Scalable Data Analytics and Artificial Intelligence* as well as the *Center for Explainable and Efficient AI Technologies*.



Open Studio@Schaufler Lab (2020). Photo: A. Wirsig.

TUD universitas in dialog with artistic and academic research

The *Schaufler Lab@TU Dresden* mediates the relationship between artistic and academic research through the residence program described here and by supporting and bringing together young scholars, researchers and artists in the spirit of the *TUD universitas*. These activities define the TU Dresden as an institution striving to address the most urgent questions, academic concepts and socio-political fields within a university context and from an interdisciplinary perspective. The goal here is to discuss and define problem areas, such as advancing technology and, especially, digitalization processes, from myriad perspectives. Inherent in this aspiration is the question of what role academics and art can play by complementing each other in this process of transformation. Since the binary view, which is often postulated despite the current state of knowledge (cf. Bippus 2010: 9) and which sets up a competition, e.g. “academic objectivity versus artistic subjectivity,” seems “no longer tenable” (ibid.), new modes must come into play, including collaborative experiments on human behavior, technical innovations and methods for handling material or exploring digital image culture. It seems more constructive now to map out areas of overlap and limitations. For instance, the production and communication of knowledge through language is often a creative act. Writing in its way is part of the genesis of its content, just as research data and findings are. Conversely, epistemological artistic work can be decidedly academic. Artist in residence, Christian Kosmas Mayer, demonstrated this with his 2019 piece *Silene*. For this project, he worked with various researchers at the Russian Academy of Sciences on a lab experiment in which a plant was grown from a 32,000-year-old seed preserved in Siberian permafrost. The result of this process was transformed into a work of art and documented for exhibition purposes: the reanimated plant of the genus *Silene* was displayed together with its bell jar and soil as an art object

and as a testament to interdisciplinary research.



Christian Kosmas Mayer: *Silene* (2019). Photo: Simon Vogel.

In conclusion, the differences among various research approaches is not fundamentally grounded in a discipline or perspective, but rather and especially in the intentions, the methodological access points and the audience to whom the findings are presented. Art exhibition spaces and platforms for the exposition of research results move toward each other when value is placed primarily on meaning generated by the interconnections forged among the actors and reached by contextualizing what is presented and not simply on the representation and exposition of results. Not only the collaborative work of the artists, humanists and social scientists who engage in both research and creative processes within the *Schaufler Labs@TU Dresden* demonstrate this; the joint projects that are realized on-site at the TU Dresden and the cooperation in art and scholarship that continue beyond that context are proof of the productive, mutually complementary relationship between art and academics in the pursuit of knowledge.

Picture above the text: Logo *Schaufler Lab@TU Dresden*. Design: Happy Little Accidents, Leipzig.

Literature

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Tags

1. Artificial Intelligence
2. cooperation between artists and scientists
3. Michael Klippahn
4. science-related art