Christoph Bareither

Cultures of Artificial Intelligence*

AI Assemblages and the Transformations of Everyday Life

Artificial Intelligence is one of the keywords of our time, and AI systems are currently initiating numerous transformations in various areas of everyday life. How can cultural anthropology at the interface with digital anthropology contribute to understanding these transformations and to shaping social and cultural negotiation processes around AI? To answer this question, this article develops the concept of AI assemblages, which aims to illuminate the dynamics of sociotechnical relations between human and more-than-human actors or elements surrounding AI systems. Assemblage thinking allows to reflect upon and describe numerous 'small' transformations of everyday life connected to AI without uncritically reproducing grand narratives of sociotechnical change and upheaval. On a more general level, analyzing AI assemblages is a way to study cultures of AI, that is, to study "a whole way of life" (Williams) in which routines, relationships, and cultural orders are increasingly shaped by AI systems. Three examples illustrate this perspective: AI assemblages in memory culture (virtual survivor testimonies in Holocaust remembrance), in popular culture (social media and their algorithms), and in academic culture (generative AI in academic research and teaching).
Keywords: artificial intelligence, assemblage, transformation, everyday life, culture

Artificial intelligence (or AI) has dominated present-day discussions like no other technology. Though computer science and the natural sciences are leading AI research, an interdisciplinary field devoted to the subject has formed across areas as different as philosophy, ethics, sociology, media studies, linguistics, information science, education, economics, and law. What can cultural anthropology[1] contribute amid this diversity of perspectives and approaches? What theories and concepts will guide anthropological research on AI and help it to shape societal debates? The

---

*   Translation by Dominic Bonfiglio. The editorial responsibility for this translation lies solely with the author of the text.

1   In Germany, the field of cultural anthropology has different strands. This paper focusses on the potential approaches in Empirische Kulturwissenschaft, or European Ethnology, for the study of AI. In the English version of this text, I do not distinguish between the specific strand of Empirische Kulturwissenschaft and the broader discipline of cultural anthropology.

following article provides some possible answers.[2] In combining the strengths of cultural and digital anthropology, it examines AI cultures as "AI assemblages". First, I outline the theoretical and conceptual underpinnings of this combined approach, and then I elucidate them using three fields, all of which are related to current research projects at the University of Tübingen. In the conclusion, I identify the problematic aspects of the concept of "artificial intelligence" and explain why I nevertheless find it analytically useful.

Artificial intelligence from the perspective of cultural anthropology

One of cultural anthropology's core strengths is its ability to analyze relationships. Rolf Lindner writes, in a much-cited passage, that "cultural analysis requires thinking in terms of relationships; it is based on the fundamental assumption that the meaning of cultural phenomena can be deciphered only by examining the network of relationships to which they owe their specific form" (Lindner 2003: 179).[3] Likewise, Jens Wietschorke (2012) has aptly described cultural anthropology as a "science of relationships". Of the theoretical approaches that cultural anthropology draws on, I consider the concept of "assemblage" to be particularly important for shedding light on the entanglements of relations that arise around AI systems. Going back to the philosophy of Gilles Deleuze and Félix Guattari (1987)[4] and further developed by theorists such as Manuel DeLanda (2006, 2016), Bruno Latour (2005), and Jane Bennett (2005), the concept of assemblage has frequently found application in cultural anthropology and the social sciences (Hansen / Koch 2022; Welz 2021). The term assemblage refers to "wholes whose properties emerge from the interactions between parts" (DeLanda 2006: 5). These wholes encompass people, things, spaces, practices, etc. Their specific attributes do not emerge merely from the sum of these parts but from the relations between their heterogeneous elements.[5] In assemblage theory, the entanglements of relations between elements are conceived neither as random

---

2   This paper is a version of my inaugural lecture at the University of Tübingen in June 2023. I have preserved much of its spoken style, though I have supplemented it in some places with further information on relevant research. The lecture marked the start of a professorship whose task is to link the perspectives of cultural anthropology (specifically Empirische Kulturwissenschaft) with the approaches of digital anthropology. Though AI is only one of many topics that is relevant for my work, I focused on it in this lecture because it currently raises particularly pressing issues in the cultural and social sciences.

3   All quotes of German texts have been translated into English by the author and translator of this paper.

4   In French, the original term for assemblage is "agencement". It was first introduced by Gilles Deleuze and Félix Guattari (see also Buchanan 2021, 41).

5   "Elements" or "components" are both terms used in assemblage thinking for any entity within an assemblage. In the English translation of this article, I use only the former term.

nor as static. Rather, assemblages are in a continuous movement that is determined by a dynamic that is intelligible, at least in part. Strictly speaking, there is no such thing as assemblage theory; there are a multitude of approaches associated with the concept of assemblage. Nowadays this approach is frequently captured by the term "assemblage thinking" (Anderson et al. 2012; Hansen / Koch 2022: 10; Müller / Schurr 2016; Tseng 2022; Welz 2021: 164).

From the perspective of digital anthropology, the crucial aspect of an assemblage is that it includes both human and non-human or more-than-human actors along with elements of their environment. Power to act is thus distributed among these actors and elements – assemblages are characterized by "distributive agency" (Bennett 2005: 462). Although human actors are the starting point of most research in cultural anthropology, the discipline recognizes that people's everyday lives cannot be understood without an understanding of their relationships to more-than-human elements. This is the core idea of relational anthropology and it is in keeping with assemblage thinking (Welz 2021: 173). The latter also integrates approaches from actor-network theory (ANT) (Farías 2011: 7; Müller / Schurr 2016; Welz 2021: 164–165), although assemblage thinking and ANT by no means overlap completely. Assemblage thinking has proven to be conceptually open to other theories. This makes it particularly suitable for cultural anthropology, which works with and often combines various theoretical perspectives. At the intersection of cultural anthropology and digital anthropology, for example, are many points of connection between assemblage thinking and theories on practices, affordances, and infrastructures.

A central theoretical argument of assemblage thinking is that the elements of an assemblage stand in "relations of exteriority" rather than in "relations of interiority" (DeLanda 2006: 18). This means, first, that assemblages are never self-contained. Rather, their elements can exist independently and form connections with several assemblages at the same time. Second, assemblages exist at different micro and macro levels. Taking a social media platform such as TikTok as an example, the reciprocal relations between a specific person, their smartphone, and the personal feeds of the platform constitute a sociotechnical assemblage at the micro level. But we can also consider the entirety of the relations between TikTok and all the connected smartphones and devices, the associated data, the users, and the attendant practices as an assemblage at the macro level. In assemblage thinking, therefore, individual micro assemblages can form populations that produce more comprehensive macro assemblages – and conversely, macro assemblages can comprise numerous smaller micro assemblages (DeLanda 2006: 16–17). Third, as is already apparent here, assemblages are interwoven by one or more of their elements. Accordingly, the boundaries delimiting one assemblage from another are difficult to draw. Which elements and relations belong to an assemblage cannot be identified once and for all. The selection depends on the specific analytical perspective. Fourth and finally, assemblages are

more than the sum of their parts. It is not only the properties of the elements in themselves that determine their function within an assemblage, but also their capacities in relation to other elements (DeLanda 2006: 11).

Understood in this way, assemblage thinking can help do justice to the increasing complexity of human-technology relations within sociotechnical entanglements. The idea of applying assemblage thinking to digital technologies and algorithms is not entirely new. However, despite the frequent mention of the term, researchers rarely spell out the theoretical potential of assemblage thinking. There are exceptions that discuss theoretical aspects of assemblage thinking in connection with algorithms (Carlson et al. 2021; Hopkins 2019; Kitchin 2017; Rosenbaum 2020; Taylor 2009). A few more recent cases also apply the concept of assemblage in the context of AI (Kim et al. 2022; Tseng 2022; Vepřek 2023).

The following text takes up these approaches and aims to develop them further. I am interested less in exploring the theoretical details than in demonstrating the analytical potential of an assemblage thinking approach to AI with examples. Assemblage thinking allows us to ask – and to describe ethnographically[6] – what functions AI systems fulfill within specific sociotechnical assemblages of human and more-than-human elements, how they co-constitute the dynamics of those assemblages, and what transformations they set in motion. The analysis of concrete AI assemblages also allows us to learn something about AI's interdependencies with the routines, relationships, and orders of human coexistence. To put it another way: analyzing AI assemblages enables us to better understand the cultures of AI.

1. AI assemblages and memory culture

The USC Shoah Foundation, founded by Steven Spielberg, developed a system in the mid-2010s that allows visitors to Holocaust museums or users at home to have 'conversations' with virtual Holocaust survivors in front of their screens.[7] In a video published by the foundation, the founder of the project, Stephen Smith, describes its intention as follows: "That conversation, that moment of dialogue, where I ask my question, and I get it answered, is just magic in the room when that happens. And we want to try and find a way to preserve that as best possible" (USC Shoah Foundation 2020). To do this, the foundation made video recordings of the answers provided by Holocaust survivors to roughly 1000 questions. The video recordings

6   For a reflection on the role of "AI ethnography", see Dippel/Sudmann (2023).
7   This example is connected to the project "From the Era of Witness to Digital Remembrance: New Media, Holocaust Sites and Changing Memory Practices" (funded by the Deutsche Forschungsgemeinschaft – 502423016). The project is a cooperation between the University of Tübingen and the Ben-Gurion University of the Negev in Israel. The ethnographic research on virtual testimonies is conducted by Berit Zimmerling. For information, see: https://uni-tuebingen.de/en/236757

were then added to interactive computer software that provides users appropriate video responses to spoken questions. The system can currently be used on two-dimensional screens such as large displays in Holocaust museums or online at home on a personal computer.[8] The videos were produced in a complex process with volumetric recordings to make them usable with three-dimensional holograms and to preserve the "magic in the room" of conversations with Holocaust survivors for future generations. From the developers' perspective, the system is intended to preserve emotional connections with Holocaust victims at a time when many witnesses of the past are dying. In this sense, the project is not simply about imparting knowledge but about implementing emotional practices of remembrance in the form of a 'living' dialogue with eyewitnesses.[9] The foundation says little in its publications and on its website about a crucial aspect of the project, however: its AI engine.

To understand its role, we first need to look at the assemblage of Holocaust remembrance from a macro perspective, across a multitude of human and more-than-human elements.[10] The relevant material spaces and things include memorial sites, museums, archives, and material testimonies. The relevant human actors include descendants, visitors, curators, historians, tour guides, and politicians who deal with issues of memory culture. But the assemblage of Holocaust remembrance also encompasses established memory practices (e.g. emotional practices of remembrance) and written and visual documents (e.g. historical sources, political position papers on remembrance, didactic concepts for educational work), among numerous other elements. Yet what constitutes the assemblage of Holocaust remembrance is not the sum of these parts, but the specific dynamics emerging through the relations between them.

Holocaust survivors play a special role within the assemblage as eyewitnesses, shaping the emotional relationships that young generations establish with the Holocaust past. In this way, they contribute to the stabilization and inner coherence of the assemblage of Holocaust remembrance. But as the last eyewitnesses die, the assemblage stands to lose a constitutive group of actors and the functions associated with them, undermining its stability. From the perspective of assemblage thinking, the development of virtual testimonies is a logical step to take. Even if the foundation emphasizes that nothing can replace a conversation between living people, virtual testimonies, to some extent, function as a substitute for actual face-to-face interactions. Tellingly, the foundation calls the software a "humanizing technology"

---

8   To use the system, go the following link: https://iwitness.usc.edu/sites/dit

9   I draw on Scheer's theory of emotional practices (Scheer 2016) and discussions on the role of affective practices in the context of memory culture (Wetherell et al. 2018).

10 For an overview of the ways that assemblage thinking has been productively deployed in museum and heritage studies, see Bareither (2023: 103).

(USC Shoah Foundation 2023b: 1). That is to say, the emotional affordances of the eyewitnesses' virtual bodies are used to utilize established emotional practices in the form of direct dialogue with survivors. In this way, the virtual testimonies work to stabilize the assemblage as a central group of its human actors vanishes.

For this purpose, an AI system was introduced as a new element in the assemblage to receive questions from human users, process them algorithmically using natural language processing (NLP) and finally play the 'most appropriate' answer from the more than 1000 possible answers. The aim is to enable a fluid and emotionally engaging "conversation-like experience" (UNC Shoah Foundation 2023a). Central to this is the process by which the NLP system learns to 'correctly' assign visitors' questions. "Trained on questions and their associated answers," the developers explain, "a statistical algorithm builds a model that predicts words that are likely to appear in the answer, given the words that are seen in the question. Responses are ranked based on how closely they match the predicted answer words" (Traum et al. 2015b: 6). The AI system is trained to 'independently' establish relationships between possible questions and predicted answers. Using input from developers and testers, it actively determines what the 'most appropriate' answer to a question is.

At the same time, the AI system is trained for interviews in which only some of the questions can be answered. Which answers are available depends on which questions were asked during the interviews. The development team made an effort to include questions from actual users and museum visitors. Nevertheless, these questions reflect only the current state of conventions in the context of Holocaust remembrance. Even if a large number of video responses were recorded, they could never cover every possible user question. The system can process only the questions whose 'suitable' answers are available in the form of recorded videos (Traum et al. 2015a: 203).

This means that the "hidden cultural assumptions" of the developers and the test users become written into the AI system (Forsythe 1996). Diana Forsythe, a pioneer of cultural anthropological research on AI, uses the phrase "hidden cultural assumptions" to describe the cultural attitudes, beliefs, and conventions that go into AI systems. In our example, the developers' assumptions are supplemented by the perspective of the visitors interviewed as a test group, who contribute their own conventions and ideas about what constitutes 'normal' questions in the context of Holocaust remembrance.

This circumstance is crucial for the way the system works. It must tailor questions to an algorithmically determined pattern that emerges from these assumptions and conventions – or else fail. If a question does not fit the pattern, the system responds with inappropriate or evasive answers, or says outright that the question cannot be answered and requests another. According to the Israeli communication scientist Amit Pinchevski, "the NDT [New Dimensions in Testimony] project is about

eliminating contingencies so as to sustain functional human-computer interaction" (Pinchevski 2019: 97). The aim of developing and refining the AI system is not to answer every possible question. Rather, it is to give users the illusion of a conversational situation that enables strong emotional experiences – even if this means adapting user questions to fit the system. Here we encounter a phenomenon that is characteristic of AI cultures: to manage the messiness of everyday interactions, computers must reduce complexity. The US-American AI researcher Kate Crawford speaks of an "epistemological flattening of complexity into clean signal for the purposes of prediction" (Crawford 2021: 213). The complexity of dialogues with eyewitnesses must also be broken down to make them algorithmically processable. In short, the introduction of the AI system works to establish and promote specific types of algorithmically functional dialogue with virtual testimonies in the assemblage of Holocaust remembrance.

The reduced complexity also shapes how conversational situations with virtual testimonies unfold. For example, the foundation published a handout for students and teachers explaining how to talk to the witnesses on the screen so to have an immersive and emotionally intense experience (USC Shoah Foundation 2023a). It includes specific questions such as "How were you liberated?", "When did you first feel free?", and "What is your message for us?" (USC Shoah Foundation 2023a). In this way, human users are taught to adapt their memory practices to the abilities of the AI system.

This raises an important question for the societal discourse on Holocaust remembrance: Is the attribution of agency to an AI system and the need to contain and align memory practices an acceptable price to pay for a technology that in the ideal case helps maintain emotional connections to witnesses of the Holocaust? The perspective on AI assemblages proposed here cannot answer this question, but it can make analytically accessible the subtle and far-reaching ways that the AI system intervenes in the assemblage of Holocaust remembrance. The ethnographic knowledge it generates enables more nuanced discussions of the question and helps recognize the complex ways in which digital technology transforms memory culture.

2. AI assemblages and popular culture

"The longer I use TikTok, the more amazing it is to see how well the feed reflects my own preferences. Sometimes it seems to me that TikTok knows me better than I'd like. When I open the app, videos are suggested to me – regardless of what my day is / was like – and after a few minutes or a few scrolls on the For You Page, they hit exactly what I want to see. [...] My For You Page constantly presents me with videos that are often shockingly accurate to my taste and therefore capture my attention. So I'm not surprised that I can spend a long time on the platform and am drawn from video to video. [...] I also particularly notice that the content of the advertisements

is very well matched to the content I am consuming, which is why I get stuck on the advertising videos from time to time. [. . .]

In answer to the question 'How well does my TikTok feed know me?', I would say after regular use that it often really does seem to know me, my interests, my views and even my sense of humor. Nevertheless, the feed can be changed and influenced quickly with relatively little effort. New content is added and other content is pushed to the back. In my opinion, the app only gives the impression that it really knows me as a user. In fact, it doesn't really know my experiences, opinions or even emotions, but creates this appearance solely based on my usage, which could change every day." (Annika Traub)

This text is a slightly edited and abbreviated excerpt from an essay written by a long-time user of the social media platform TikTok as part of a seminar in cultural anthropology on the question "How well does my TikTok feed know me?". Feeds are the endless streams of images, videos, texts, and sounds that social media platforms generate for their users. These streams of digital content are, as TikTok claims on its website, "curated to your interests" (TikTok 2020).

Social media feeds are integrally connected to content producers, users, click-workers, data, content, interfaces, and algorithms. Together, they form what we in a current study call "curatorial assemblages".[11] In the case of TikTok, an AI system plays a key role in the production of these assemblages. The platform is particularly effective at recognizing the tastes and interests of its users and providing them suitable content. Usage statistics also show that the number of people drawn into TikTok's feed is growing, especially among young people. According to the annual ARD/ZDF online study, 44 % of 14-29-year-olds in Germany were using TikTok at least once a week in 2022, and the numbers are rising (Koch 2022: 472). For almost every second person in adolescence or young adulthood, video feeds on this platform are already part of everyday life in Germany.[12]

The question of the relationship between AI and everyday life is already present in societal discourse. It is clear that AI is changing our everyday lives. But we still know very little about how. Cultural anthropology can make a contribution here by shedding ethnographic light on actual everyday practices and experiences in the

---

11 The study, titled "Curating the Feed: Interdisciplinary Perspectives on Digital Image Feeds and their Curatorial Assemblages" (funded by the Deutsche Forschungsgemeinschaft – 421299207), is an interdisciplinary cooperation between the University of Tübingen and the Bauhaus University Weimar. The ethnographic research in this project is carried out by Ann-Marie Wohlfarth. For more information, see https://uni-tuebingen.de/en/239241

12 According to developers, the Instagram platform feed is also controlled by AI (Meta 2023). In 2022, the weekly use of Instagram among 14-29-year-olds in Germany was as high as 74 % (Koch 2022: 472). In the "Curating the Feed" project, we shed light on both Instagram and TikTok. In this article, however, I consider only the latter platform.

context of AI. This perspective does not stand alongside the assemblage thinking approach, but it can be productively combined with it. From the perspective of cultural anthropology, everyday routines and practices are central elements in AI assemblages. Manuel DeLanda also talks about the constitutive function of "habitual repetition" in assemblages (DeLanda 2006: 50). Cultural anthropology is well-equipped to research this function of everyday routines in assemblages because it already has a multi-layered understanding of a diverse set of everyday cultural spheres.

TikTok, for example, is woven into the everyday routines of popular culture. The platform is permeated by the logic of the popular. It focuses on short, snappy, funny, relaxing, upsetting, sad, or impressively beautiful content. Kaspar Maase's theory of aesthetic experience (2022) helps us understand how TikTok is interwoven with popular culture. He draws on practice theory and ANT to describe "aesthetic interaction as co-laboration" between human and more-than-human actors and elements (Maase 2022, 115–120). In such co-laborations, "aesthetic relationships to the world, to ourselves and to the texts with which we co-laborate are formed" (Maase 2022: 54).

TikTok's AI system also produces aesthetic co-laborations. It identifies patterns in the behavior of individual users and compares them with that of other users.[13] The patterns are derived from signals that users send during their everyday use – by liking content or following accounts, say. Such signals are, therefore, always active. The platform also registers how long a user watches a certain video and uses this to draw conclusions about the person's taste. The AI system then utilizes the data to establish comparative relationships between the aesthetic preferences of different users. This comparison is then used as the starting point for the algorithmic sorting of content into individual feeds. As an individual user, the feed presents content to me that is liked by other users who also liked other content I already liked before.

The resulting process of aesthetic co-laboration is not simply one between humans and algorithms. The AI system also enables aesthetic co-laboration between humans and other humans via the data traces left in the system and their linkage with the masses of digital content. TikTok's AI system weaves a network of relationships between actors that leads to routines of aesthetic experience that stabilize the network of relationships in return. For individual users, the result is a globally

---

13 The exact algorithms used by TikTok are largely unknown. Both Meta and TikTok have carried out transparency initiatives for the past several years (Meta 2023, TikTok 2020), but the value of their findings remains questionable (Grandinetti 2023) and many important details are missing. For example, that pattern recognition plays a central role for TikTok became known only from a rare statement made by TikTok CEO Shou Chew in a television interview (TED 2023, 5:55). This information cannot be independently verified, however.

networked yet unique curatorial assemblage – and for many, it becomes an integral part of their everyday lives.

On TikTok and other social medial platforms, digital popular culture and economic logics are intertwined. AI systems are being monetized on an unprecedented scale, and platforms such as TikTok are at the forefront of these processes. The economic profit is mainly generated from advertising revenue. "Social media platforms", the Australian communication scientist Nicolas Carah writes, "bring together the mediation of everyday life with a technical apparatus that rationalizes and valorizes those communicative practices" (Carah 2014: 137). AI systems maximize this algorithmic valuing of communicative practices. The better the AI system weaves users into the web of aesthetic relationships, the longer they scroll through the feed, the more advertising can be sold, and the greater the economic success of the platform. Anyone who uses TikTok inevitably becomes part of AI-supported data economies.

In order to hold users' attention as long as possible, the platform caters to specific areas of interest and creates 'niches' for individual tastes. The US *Wall Street Journal* conducted a series of tests with pre-programmed bots that simulated the behavior of TikTok users (*Wall Street Journal* 2021). The tests show how users can be pulled into "rabbit holes" of content (*Wall Street Journal* 2021, 10:40). "[T]he algorithm", the founder of Algotransparency, Guillaume Chaslot, writes, "is pushing people towards more and more extreme content, so it can push them toward more and more watch time" (*Wall Street Journal* 2021, 09:52). For example, users who repeatedly watch sad videos are easily drawn into a web of content portraying a range of experiences from melancholy to the explicitly depressive.[14]

This raises the question to what extent the curatorial assemblages formed by AI not only co-constitute concrete everyday routines but also shape how users perceive their everyday environments and their own role in them on a broader level. Young people's TikTok or Instagram channels are not only used to discuss topics such as depression, but also everyday life at school, relationship problems, body images, climate change, war, etc. Of course, it is nothing new for popular culture to deal with everyday topics. Following Peter Berger and Thomas Luckmann (1990 [1967]) on the social construction of reality, we can say that popular culture is oftem formative in how human beings negotiate intersubjective everyday realities. What is new is that the AI-based curatorial assemblages of social media platforms co-curate these popular cultural negotiation processes for millions of users simultaneously and in a personalized manner, thereby shaping the constitution of intersubjective everyday realities in a multilayered way.

---

14 But TikTok itself has rejected this idea and has argued that the AI system "diversifies" the feed (TikTok 2020).

3. AI assemblages and science culture

2023 was the year of the breakthrough of generative AI, i.e. AI systems that can generate text and image content based on extensive training data (Cao et al. 2023). Text-based generative AI systems are also known as large language models, or LLMs for short. The best-known system currently contributing significantly to the hype surrounding this type of AI is the Generative Pre-Trained Transformer (or GPT) from the US company OpenAI.[15] GPT was trained using massive amounts of data from the Internet. Using neural networks, the system can recognize frequencies, probabilities, and relationships between word elements (tokens) and generate new texts based on this knowledge. It can interpret any text input (known as a prompt) and generate a mostly logical and relatively coherent text output. GPT can easily summarize texts, reproduce core arguments, describe scientific disciplines, or formulate theoretical 'thoughts' and contexts.

But the popularity of GPT is not necessarily due to a quantum leap in technology. Although versions 3.5 and 4.0 (known as ChatGPT and ChatGPT Plus) marked a new phase in the public AI discourse, they were more extensions of already established systems. According to the CEO of OpenAI, Sam Altman, what distinguished ChatGPT when it was released "wasn't the underlying model...it was the usability of it..." (Fridman 2023, 5:50). The significantly increased user-friendliness made it possible for users without special technical or programming knowledge to generate complex text outputs or hold conversations with the AI system with little effort.

The new accessibility of generative AI is currently resetting cultural orders in various areas of everyday life, including universities. Many students now use generative AI to create texts, and established academics are beginning to incorporate the technology into their research and writing. This has opened up a wealth of possibilities and problems. Universities around the world have had to issue guidelines for dealing with generative AI. At a well-attended online event in the summer of 2023, the Director of Policy and Foresight of the European University Association (EUA) described the emergence of generative AI as a "wake-up call to just how disruptive these new technologies can be" (European University Association 2023, 1:55).

The assemblage thinking concepts of (re)territorialization and deterritorialization can help understand these AI-induced disruptions. As Deleuze and Guattari write, every assemblage "has both territorial sides, or reterritorialized sides, which stabilize it, and cutting edges of deterritorialization, which carry it away" (Deleuze / Guattari 1987: 88). Put simply, (re)territorialization is about an assemblage's stabi-

---

15 A distinction must be made between the GPT model (LLM) and the more comprehensive GPT system, which includes a chatbot, interfaces on various end devices, multimodal interaction options, programming interfaces, and more. In the following, I always use GPT to refer to the comprehensive GPT system.

lization and continuous remanifestation, and deterritorialization is about its frag-
mentation and dissolution. The processes affect different disciplines and subject
groups, each of which can be described in different ways as its own assemblage with
its own epistemic routines and conventions. For computer science, the success of
AI has mostly stabilizing effects. The assemblages of the cultural sciences, social
sciences, and the humanities, by contrast, have been initially destabilized by AI and
transformed as a result.

The first part of that transformation has been caused by the sudden lack of
transparency in the authorship of academic texts. Right now, discussions focus on
plagiarism and fraud. But the problem actually goes much deeper. The lack of trans-
parency of authorship will inevitably lead to a loss of trust between teachers and
students, and between colleagues who can no longer be sure that others still adhere
to the value of original texts. In the process, generative AI will permanently disrupt
established notions of authentic authorship and the relationships of trust tied to
them. This development has deterritorializing effects, especially for the assemblages
of the cultural and social sciences as well as the humanities, where texts and their
authors have a particularly close relationship and where the independent writing of
complex texts plays an important role in teaching and learning.

But another part of that transformation is the possibility that generative AI
could permanently change epistemic practices in research. In areas where scientists
have been confronted with this possibility, there are signs of even more far-reaching
deterritorializations of academic assemblages. To illustrate this, consider a sample
dialogue with GPT (version 4.0) that took place in the summer of 2023. I deliberately
use anthropomorphizing terms (e.g. "GPT explains X") to simplify and symbolize the
conversation. I began the conversation with the core question that guides this ar-
ticle: "What would it mean to apply assemblage theory to artificial intelligence?" In
response, GPT first explained what assemblage theory is about and provided a very
good short definition. Then the system continued:

> "Applying Assemblage Theory to Artificial Intelligence would involve analyzing AI not
> as an isolated, singular entity but as a complex system that emerges from the interac-
> tions of various components. These components could be understood in many ways,
> such as hardware, software, algorithms, data sets, designers, users, socio-cultural
> contexts, legal frameworks, ethical considerations, etc.
> According to this perspective, the capacities, behaviors, and effects of an AI system
> cannot be fully understood by analyzing its individual components alone. Instead,
> they emerge from the interactions, relationships, and synergies among these compo-
> nents. [. . .]"

The approach proposed by GPT here corresponds in its basic features to the perspec-
tive developed in this article. A lengthy academic dialogue ensued between me and
GPT, during which I asked the system to elaborate on various points. For example,

we talked about the contribution cultural anthropologists can make to analyzing AI assemblages. We addressed specific questions such as the dynamics of re- and deterritorialization of academic assemblages in the context of generative AI. And we discussed which emergent properties of elements may arise within academic assemblages when generative AI is involved. In this complex dialogue, GPT repeatedly made list-like in-depth suggestions: facets I could consider, thoughts that might be worth mentioning, arguments that seem coherent, etc.

What developed between me and GPT can be described as a hybrid epistemic practice. We talked *together* about an area of research I was interested in and developed potential ideas and approaches. As in previous dialogues, I was astonished by the epistemic capabilities of the system. After all, I knew that GPT can only reproduce, recombine, and vary fragments of existing text data. The system is, according to a formulation by Emily M. Bender et al, a "stochastic parrot" (Bender et al. 2021). GPT ultimately reproduces clichés of texts and text genres without being able to develop an understanding of their meaning. But if this system nevertheless comes up with ideas similar to my own and makes interesting suggestions for thought, what does that say about my own human epistemic practices?

To distract myself from the potential implications of this question, I tried to lure GPT into an argumentative trap. I entered the following into the prompt: "Let's consider the social sciences and humanities as an assemblage within which human actors (researchers and students, for example) form hybrid epistemic practices with generative AI (such as yourself). Who is in control of these practices?" My hope was to present the system with an analytical dichotomy that only allows for wrong answers. GPT did not fall for the trick, however:

> "The question of control in hybrid epistemic practices involving human actors and generative AI is complex and multifaceted. It's important to note that 'control' might not be the best framing for these relationships, as it implies a hierarchical relationship that may not capture the nuances of how humans and AI interact in practice. Rather, these practices could be better understood in terms of collaboration, interaction, or mutual shaping. [...] So, control in hybrid epistemic practices involving human actors and generative AI is distributed and contextual. It's not accurate to say that either the human actors or the AI are solely in control. Rather, they interact in complex ways, with different degrees of influence over different aspects of the practices. [...]"

My hope of exposing GPT as a cliché-reproducing machine came to naught. Rather, it turned out that GPT can also be 'critical' in its own way. The system rightly pointed out that the question "Who is in control?" was one-sided and requires more precise differentiation. Or was this kind of criticism itself a scientific cliché that GPT skillfully reproduced?

What remains is a moment of uncertainty, a destabilization of the academic assemblage surrounding me and my own epistemic practices. This moment of uncer-

tainty is indeed a threat to the established routines of the cultural and social sciences as well as the humanities, but it is also an opportunity for their further development. For while GPT, like comparable systems from the field of generative AI, unsettles academic assemblages, new capacities and relations within them are opening up all the time. This is possible because substantial parts of these assemblages have already been fed into GPT in the form of scientific texts. The system then establishes relations between heterogeneous knowledge elements of each assemblage, which become the basis for dialogues with human users and thus enable hybrid epistemic practices.

It is to be expected that over a longer period this will fundamentally change the relations between humans and AI systems and will play a formative role in academic assemblages. Libuše Hannah Vepřek uses the term "intraversions" to describe "processual forward movements and shifts within relations between humans and technology" in the context of AI (Vepřek 2023: 4). Within these forward movements, subject/object positions and the distribution of agency undergo renegotiation. This process also affects universities and is likely to change them permanently. A recent survey conducted by the University of Hamburg in September 2023 revealed that "70% of students and around 80% of teachers" use generative AI "to varying degrees and for a wide variety of tasks" (Preiß et al. 2023: 45). Against this backdrop, universities need to initiate a process of critical evaluation. In this context, assemblage thinking can help better identify and understand both the potential benefits and the problematic implications of AI within academic assemblages.[16]

Conclusion: from cultures of AI to AI assemblages

AI experts have rightly pointed out that the term "artificial intelligence" is misleading. First, it threatens to obscure the extractive processes related to AI systems. These include the exploitation of human labor, the monetization of data from unsuspecting users, and the consumption of valuable natural resources (Crawford 2021: 69). Second, from a computer science perspective, a term like "machine learning" is much more appropriate than "artificial intelligence" (von Luxburg 2020: 2). Third, the term AI reproduces the hype associated with it, serving both dystopian and utopian imaginations.

But despite the many arguments against the analytical use of the term AI there are several that speak for it. First, the term is firmly anchored in public debates and, despite its vagueness, it helps research on AI to address debates in society as a whole.

---

16 This is precisely the aim of the ethnographic research project "Hybrid Epistemic Practices: Generative Artificial Intelligence and the Transformation of Academic Assemblages in the Qualitative Social Sciences and Humanities" (funded by the Excellence Strategy of the German federal and state governments), which started at the University of Tübingen in the spring of 2024. For more information, see: https://uni-tuebingen.de/en/257045

Second, and more importantly, the imaginaries associated with AI are an integral part of AI assemblages. They are inscribed in the practices and experiences of the people who deal with AI systems and in the development processes that produce them. Third, the attribution of "intelligence" has added analytical value from an anthropological perspective, though AI systems are not intelligent by human standards and comparing the one to the other is misleading. The reason is that within AI assemblages AI systems have the relational ability to 'learn' from other elements and establish relations with them, which makes them *appear* intelligent to many human actors. Even if the intelligence of AI systems is not human, the consequences of this appearance of intelligence are an influential factor within the respective AI assemblage. From this perspective, the question of the intelligence of AI systems is no longer one of technical properties but of human-technology relations. This is why I consider the concept of AI to be analytically useful for relational cultural and digital anthropology.

At any rate, cultural anthropology is used to dealing with problematic terms. After all, its most prominent term, culture, is at least as difficult as AI. The concept of culture can enable exclusionary thinking, contributing to the othering of 'foreign' cultures, and it can make elitist demarcations between 'high culture' and 'low popular culture' (Bareither 2022; Lindner 2003; May 2020). Cultural anthropology recognizes these problems, but it holds onto the concept to promote critical thinking about culture as "a whole way of life" (Williams 2014: 95). In the same sense, to explore cultures of AI is to ask how AI inscribes itself into our entire way of life. I have shown this in the cases of memory culture, popular culture, and scientific culture – but many other examples could be put forward.

A diverse theoretical toolbox can help us in shedding light on AI cultures. I would like to suggest that assemblage thinking is one of the most productive approaches for this purpose. "AI assemblage" outlines the conceptual perspective presented here. Thinking in terms of assemblages by no means contradicts thinking in terms of culture. On the contrary, the assemblage thinking approach is a way of enhancing cultural analysis towards an analysis of complex sociotechnical assemblages that includes specific concepts for studying their individual aspects (e.g. the dynamics of de- and reterritorialization). While culture describes the routines, relationships, and orders of coexistence on a superordinate level, assemblages always refer to individual sociotechnical entanglements consisting of concrete elements and distinct, emergent relations between them.

I thus propose understanding AI assemblages as individual and concrete materializations of AI cultures. They are characterized by their specific yet fluctuating dynamics, which result from the relations between people, AI systems, and numerous other elements. AI assemblages are co-constituted by everyday routines and shape

the intersubjective everyday realities of the people involved in them. In doing so, they shape, stabilize, or question existing cultural orders, sometimes in radical ways.

This perspective also offers starting points for a critical understanding of the hype surrounding AI systems. Like other technologies (Schönberger 2015), AI systems do not simply make everything 'new', but they precipitate multi-layered transformations of everyday life. Assemblage thinking is helpful because it allows us to understand the numerous 'small' transformations associated with AI micro-analytically and to situate them within comprehensive sociotechnical processes of change, without uncritically reproducing the grand narratives of upheaval through AI. By employing such a differentiated form of analysis to create a multi-layered knowledge base of AI assemblages, cultural anthropology can make a valuable contribution to interdisciplinary research and social debates surrounding AI.

References

Anderson, Ben, Matthew Kearnes, Colin McFarlane and Dan Swanton. 2012. "On Assemblages and Geography." *Dialogues in Human Geography* 2/2: 171–189. Last accessed on 04. 12. 2023. https://doi.org/10.1177/2043820612449261.

Bareither, Christoph. 2022. "Kultur ist mehr... Zum vielfältigen Kulturbegriff der EKW." In *Kultur ist: Beiträge der Empirischen Kulturwissenschaft in Tübingen*, edited by Ludwig-Uhland-Institut, 11–45. Tübingen: EKW-Verlag.

Bareither, Christoph. 2023. "Museum-AI Assemblages: A Conceptual Framework for Ethnographic and Qualitative Research." In *AI in Museums: Reflections, Perspectives and Applications*, edited by Sonja Thiel and Johannes Bernhardt, 99–113. Bielefeld: transcript. https://doi.org/10.1515/9783839467107-010

Bender, Emily M., Timnit Gebru, Angelina McMillan-Major and Shmargaret Shmitchell. 2021. "On the Dangers of Stochastic Parrots: Can Language Models Be Too Big?." In *Proceedings of the 2021 ACM Conference on Fairness, Accountability, and Transparency*, 610–623. Virtual Event Canada: ACM. Last accessed on 04. 12. 2023. https://doi.org/10.1145/3442188.3445922.

Bennett, Jane. 2005. "The Agency of Assemblages and the North American Blackout. *Public Culture* 17/3: 445–465." Last accessed on 04. 12. 2023. https://doi.org/10.5422/fso/9780823226443.003.0031

Berger, Peter L. and Thomas Luckmann. 1990 [1966]. *The Social Construction of Reality. A Treatise in the Sociology of Knowledge*. New York: Anchor Books.

Buchanan, Ian. 2021. *Assemblage Theory and Method: An Introduction and Guide*. London and New York: Bloomsbury Academic.

Cao, Yihan, Siyu Li, Yixin Liu, Zhiling Yan, Yutong Dai, Philip S. Yu and Lichao Sun. 2023. "A Comprehensive Survey of AI-Generated Content (AIGC): A History of Generative AI from GAN to ChatGPT". *https://arxiv.org/abs/2303.04226*: 1–44. https://doi.org/10.48550/ARXIV.2303.04226.

Carah, Nicholas. 2014. "Curators of Databases: Circulating Images, Managing Attention and Making Value on Social Media." *Media International Australia* 150/1: 137–142. Last accessed on 04. 12. 2023. https://doi.org/10.1177/1329878X1415000125.

Carlson, Rebecca, Ruth Dorothea Egel, Lina Franken, Libuše Hannah Vepřek, and Sarah Thanner. 2021. "Approaching code as process: Prototyping ethnographic methodologies." *Kuckuck. Notizen zur Alltagskultur* 21/1 (Code): 13–17.

Crawford, Kate. 2021. *Atlas of AI: Power, Politics, and the Planetary Costs of Artificial Intelligence*. New Haven: Yale University Press. https://doi.org/10.12987/9780300252392

DeLanda, Manuel. 2006. *A New Philosophy of Society: Assemblage Theory and Social Complexity*. London und New York: Continuum.

DeLanda, Manuel. 2016. *Assemblage Theory*. Edinburgh: Edinburgh University Press.

Deleuze, Gilles and Félix Guattari. 1987. *A Thousand Plateaus: Capitalism and* Schizophrenia, trans. Brian Massumi. Minneapolis: University of Minnesota Press.

Dippel, Anne and Andreas Sudmann. 2023. "AI Ethnography." In *Handbook of Critical Studies of Artificial Intelligence*, edited by Simon Lindgren, 826–844. Cheltenham: Edward Elgar Publishing. Last accessed on 04. 12. 2023. https://doi.org/10.4337/9781803928562.00083

European University Association. 2023. EUA-ELIA webinar – Beyond ChatGPT: what next for generative AI in higher education. Youtube, 26. Juni. https://www.youtube.com/watch?v=idH7I7SCcQc

Farías, Ignacio. 2011. "Introduction: Decentring the Object of Urban Studies." In *Urban Assemblages: How Actor-Network Theory Changes Urban Studies*, edited by Ignacio Farías and Thomas Bender, 1–24. London: Routledge.

Forsythe, Diana E. 1996. "New Bottles, Old Wine: Hidden Cultural Assumptions in a Computerized Explanation System for Migraine Sufferers." *Medical Anthropology Quarterly* 10/4: 551–574. Last accessed on 04. 12. 2023. https://doi.org/10.1525/maq.1996.10.4.02a00100.

Fridman, Lex. 2023. "Sam Altman: OpenAI CEO on GPT-4, ChatGPT, and the Future of AI." Lex Fridman Podcast. Youtube, March 25. https://www.youtube.com/watch?v=L_Guz73e6fw.

Grandinetti, Justin. 2023. "Examining Embedded Apparatuses of AI in Facebook and TikTok." *AI & SOCIETY* 38/4: 1273–1286. Last accessed on 04. 12. 2023. https://doi.org/10.1007/s00146-021-01270-5.

Hansen, Lara and Gertraud Koch. 2022. "Assemblage: Constructing the Social in Empirical Cultural Research." *Hamburger Journal für Kulturanthropologie* (HJK) 14: 3–15.

Hopkins, Julian. 2019. "The Blog as Assemblage: Agency and Affordances." In *Monetising the Dividual Self: The Emergence of the Lifestyle Blog and Influencers in Malaysia*, 11–27. New York: Berghahn Books. https://doi.org/10.2307/j.ctv12pnrw6.8

Kim, Eun-sung, Gi Woong Yun and Yoehan Oh. 2022. "The Dynamics of Data-Algorithm Assemblages and Sociotechnical Challenges to Computer Vision." *SSRN Electronic Journal*. Last accessed on 04. 12. 2023. https://doi.org/10.2139/ssrn.4070575.

Kitchin, Rob. 2017. "Thinking Critically about and Researching Algorithms." *Information, Communication & Society* 20/1: 14–29. Last accessed on 04. 12. 2023. https://doi.org/10.1080/1369118X.2016.1154087.

Koch, Wolfgang. 2022. "Ergebnisse der ARD/ZDF-Onlinestudie 2022: Reichweiten von Social-Media-Plattformen und Messengern." *Media Perspektiven* 10: 471–478.

Latour, Bruno. 2005. *Reassembling the Social: An Introduction to Actor-Network-Theory*. Oxford: Oxford University Press. https://doi.org/10.1093/oso/9780199256044.001.0001

Lindner, Rolf. 2003. "Vom Wesen der Kulturanalyse." *Zeitschrift für Volkskunde* 99/1: 177–188.

Luxburg, Ulrike von. 2020. "Wie funktioniert maschinelles Lernen?" Universität Tübingen, 19. August. Last accessed on 04. 12. 2023. https://www.tml.cs.uni-tuebingen.de/team/luxburg/publications/luxburg_wie_funktioniert_ml.pdf

Maase, Kaspar. 2022. *Schönes alltäglich erleben: Über die Ästhetisierung der Kultur*. Bielefeld: transcript. https://doi.org/10.1515/9783839461174

May, Sarah. 2020. "Kultur." In *Kulturtheoretisch argumentieren: Ein Arbeitsbuch*, edited by Timo Heimerdinger and Markus Tauschek, 236–269. Münster and New York: Waxmann.

Meta. 2023. "Introducing 22 system cards that explain how AI powers experiences on Facebook and Instagram." Meta, June 29. Last accessed on 04. 12. 2023. https://ai.meta.com/blog/how-ai-powers-experiences-facebook-instagram-system-cards/

Müller, Martin and Carolin Schurr. 2016. "Assemblage Thinking and Actor-Network Theory: Conjunctions, Disjunctions, Cross-Fertilisations." *Transactions of the Institute of British Geographers* 41/3: 217–229. Last accessed on 04. 12. 2023. https://doi.org/10.1111/tran.12117.

Pinchevski, Amit. 2019. "Transmitted Wounds: Media and the Mediation of Trauma." New York: Oxford University Press. Last accessed on 04. 12. 2023. https://doi.org/10.1515/commun-2021-0086

Preiß, Jennifer, Mareike Bartels, Julia Niemann-Lenz, Julia Pawlowski, and Kai-Uwe Schnapp. 2023. "'ChatGPT and me' Erste Ergebnisse der quantitativen Auswertung einer Umfrage über die Lebensrealität mit generativer KI an der Universität Hamburg." Universität Hamburg, 26. September. Last accessed on 04. 12. 2023. https://doi.org/10.25592/UHHFDM.13402.

Rosenbaum, Howard. 2020. "Algorithmic Neutrality, Algorithmic Assemblages, and the Lifeworld." *AMCIS 2020 Proceedings* 6: 1–10.

Scheer, Monique. 2016. "Emotionspraktiken: Wie man über das Tun an die Gefühle herankommt." In *Emotional Turn?!: Europäisch ethnologische Zugänge zu Gefühlen & Gefühlswelten*, edited by Matthias Beitl and Ingo Schneider, 15–36. Vienna: Selbstverlag des Vereins für Volkskunde.

Schönberger, Klaus. 2015. "Persistenz und Rekombination: Digitale Kommunikation und soziokultureller Wandel." *Zeitschrift für Volkskunde* 111/2: 201–213.

Taylor, T. L. 2009. "The Assemblage of Play." *Games and Culture* 4/4: 331–339. Last accessed on 04. 12. 2023. https://doi.org/10.1177/1555412009343576

TED. 2023. "TikTok CEO Shou Chew on Its Future — and What Makes Its Algorithm Different. Live at TED2023." Youtube, April 21. https://www.youtube.com/watch?v=7zC8-06198g

TikTok. 2020. "How TikTok recommends videos #ForYou." TikTok, June 18. Last accessed on 04. 12. 2023. https://newsroom.tiktok.com/en-us/how-tiktok-recommends-videos-for-you

Traum, David, Kallirroi Georgila, Ron Arnstein and Anton Leuski. 2015a. "Evaluating Spoken Dialogue Processing for Time-Offset Interaction." In *Proceedings of SIGDIAL*, 199–208. Last accessed on 04.12.2023. http://www.aclweb.org/anthology/W/W15/W15-4629.pdf.

Traum, David, Andrew Jones, Kia Hays, Heather Maio, Oleg Alexander, Ron Artstein, Paul Debevec, Alesia Gainer, Kallirroi Georgila, Kathleen Haase, Karen Jungblut, Anton Leuski, Stephen Smith and William Swartout. 2015b. "New Dimensions in Testimony: Digitally Preserving a Holocaust Survivor's Interactive Storytelling." In *Interactive Storytelling-8th International Conference on Interactive Digital Storytelling*, edited by Henrik Schoenau-Fog, Luis Emilio Bruni, Sandy Louchart and Sarune Baceviciute, 269–281 Heidelberg: Springer. https://doi.org/10.1007/978-3-319-27036-4_26

Tseng, Yu-Shan. 2022. "Assemblage Thinking as a Methodology for Studying Urban AI Phenomena." *AI & SOCIETY*, June. Last accessed on 04.12.2023. https://doi.org/10.1007/s00146-022-01500-4.

USC Shoah Foundation. 2020. "Dimensions in Testimony: USC Shoah Foundation." Youtube, April 3. Video, 0:56. https://www.youtube.com/watch?v=nGzAc9mIoTM

USC Shoah Foundation. 2023a. "Teach with Dimensions in Testimony: Guidelines for Educators." Last accessed on 04.12.2023. https://assets.ctfassets.net/r2fjqekz37jz/6ahE6r8EENMjBA7VKeRc9K/dabec891d386513f1fd26741737401a4/DiT_Guidelines_for_Educators.pdf

USC Shoah Foundation. 2023b. "Frequently Asked Questions: The Who, Where, Why and What about Dimensions in Testimony." Last accessed on 04.12.2023. https://sfi.usc.edu/dit/faq

Vepřek, Libuše Hannah. 2023. *At the Edge of Artificial Intelligence: Intraversions in Human Computation Systems*. PhD diss., Ludwig-Maximilian-Universität München. In press as: Vepřek, Libuše Hannah. 2024 [forthcoming]. At the Edge of AI. Human Computation Systems and their Intraverting Relations. Bielefeld: transcript.

Wall Street Journal. 2021. "Investigation: How TikTok's Algorithm Figures Out Your Deepest Desires." WSJ, July 21. Last accessed on 04.12.2023. https://www.wsj.com/video/series/inside-tiktoks-highly-secretive-algorithm/investigation-how-tiktok-algorithm-figures-out-your-deepest-desires/6C0C2040-FF25-4827-8528-2BD6612E3796

Welz, Gisela. 2021. "Assemblage." In *Theoretische Reflexionen: Perspektiven der Europäischen Ethnologie*, edited by Peter Hinrichs, Martina Röthl and Manfred Seifert, 69–87. Berlin: Dietrich Reimer Verlag GmbH. https://doi.org/10.5771/9783496030560-161

Wetherell, Margaret, Laurajane Smith and Gary Campbell. 2018. "Introduction: Affective heritage practices." In *Emotion, Affective Practices, and the Past in the Present*, edited by Laurajane Smith, Margaret Wetherell and Gary Campbell, 1–21. Milton: Routledge. https://doi.org/10.4324/9781351250962-1

Wietschorke, Jens. 2012. "Beziehungswissenschaft: Ein Versuch zur volkskundlich-kulturwissenschaftlichen Epistemologie." *Österreichische Zeitschrift für Volkskunde* 115/3&4: 325–359.

Williams, Raymond. 2014. "Culture is Ordinary" (1958). In *Raymond Williams on Culture & Society: Essential Writings*, edited by Jim McGuigan, 91–100. London: SAGE Publications Ltd. Last accessed on 04.12.2023. https://doi.org/10.4135/9781473914766.n1.