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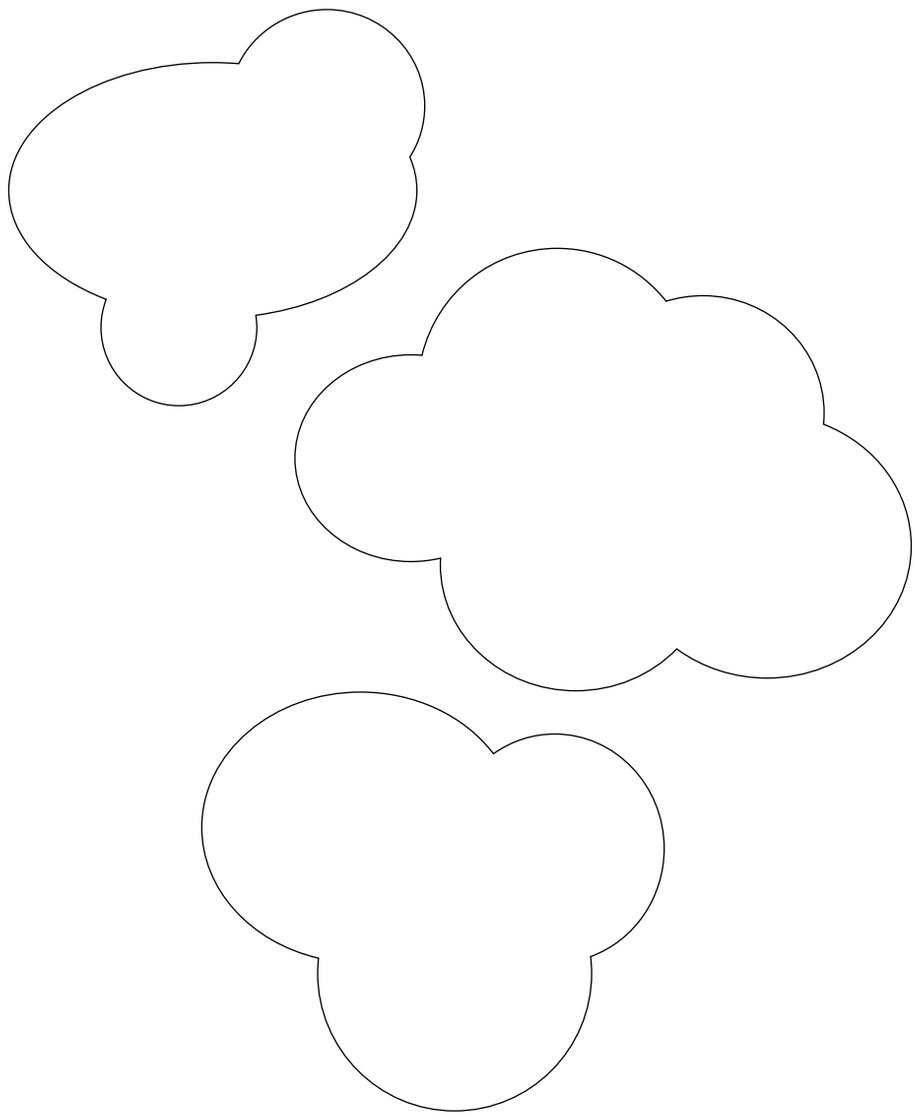
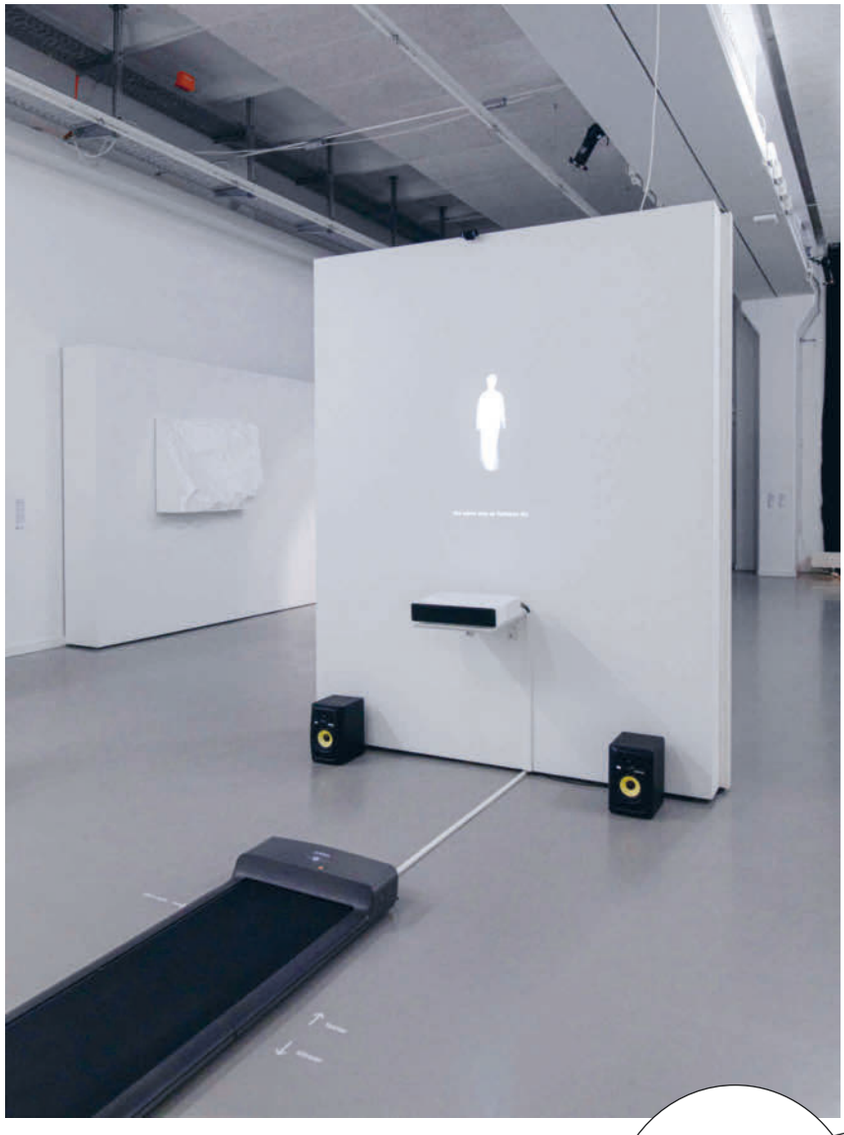


Creativity in the Age of Artificial Intelligence

Orlando Budelacci



↑ **Fig. 1 Kim da Motta, *How would I walk, had I never seen a woman walk?,* installation view in the graduation show at Lucerne School of Art and Design, 2022**

Artificial intelligence is in the process of conquering the world. It has already penetrated many fields of application that were previously the sole preserve of humans, completely inaccessible to machines. What was unthinkable a few years ago is about to become everyday reality: medical diagnostics take over the early detection of diseases, chatbots respond to customer enquiries, facial recognition is used to identify war victims and drones find their targets independently of human control. Advances in autonomous driving are astounding, machines are winning against humans with ease in chess and on quiz shows and assisting and replacing humans for translation into dozens of languages. AI technology is also being used in the fight against increasing environmental pollution, with robots sorting waste and controlling transport systems to reduce emissions. AI algorithms are present in our everyday lives, using big data to control recommendation systems for streaming on Netflix and ordering on Amazon. In short, machines have already surpassed humans in many capabilities and are influencing or controlling them at work, in society and in the economy.

In view of the enormous progress in the field of AI, the question arises as to whether there are areas into which machines have not yet advanced. Almost always, the area of creativity and art is mentioned, which seems to be beyond mechanized influence. The idea of machines continuously surpassing human intelligence has become a threat to human beings' self-image: what will become of us when there are no more areas in which we are not surpassed? What if we are in the process of doing away with the human being altogether, without consciously meaning to? If one asks what distinguishes the human being from a machine, human creativity certainly occupies a special place.[1] This aspect of humanity is full of mys-

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teries and undiscovered secrets and not very accessible to rational understanding. How can we succeed in simulating it if it is poorly explained? AI systems use data to emulate artistic creation. Their path follows mathematics and statistics, not intuition and feeling. Understanding creativity is a key to understanding the limits and limitations of AI.[2]

The new does not arise out of nothing, it is constituted relationally.

Creativity – what is it?

While digitalisation and algorithmicization have increased in the 20th and 21st centuries, society has placed growing value and importance on the idea of creativity. Being creative, creating something new, has become an unquestioned place of positivity. There is no one who does not want to be creative, no one trusts solely in the power of tradition and the continuation of the existing. The complexity of the world constantly demands new solutions. Creativity has taken on a new role as well as new economic relevance, and Hans-Ulrich Gumbrecht has already asked whether creativity is a spent term.[3] It is no longer assigned merely to the realm of individual artistic self-development, its place is no longer the margin, the outside, the critical-reflexive of society; creativity has entered into a close connection with capitalist production. The result of this connection between creativity and capital or the economy is called the ‹creative industries›. The concept of creativity is of ubiquitous relevance in the present; it has also entered into a close connection with technology and design.[4]

There is no one who does not want to be creative...

In a general understanding, it refers to the emergence of something new; a mental mechanism of creative thinking that produces new results and artefacts that have never been there before. It is a multi-faceted term that, depending on how it is used, denotes a process, a product or a skill. In what follows, I would like to identify three main characteristics. This is interesting for the discussion of the creativity of machines because criteria are elaborated which provide a reference point for assessing creative artefacts and processes.

Creativity refers to the result of a creative process that is *unexpected*, that is, one that could not be predicted and planned for.[5] It arrives unprepared and then suddenly, it strikes. Depending on which vocabulary one uses, one can speak here of an idea, a discovery, a flash of inspiration or a sparking idea. This moment is an unconscious action that escapes conscious control. It occurs independently of a rationally controlled thought process. It is an act of accessing the innermost part of the human being. This access requires intensity and passion; it usually occurs only if it has been preceded by a preparatory process.

It is an act of accessing the innermost part of the human being.

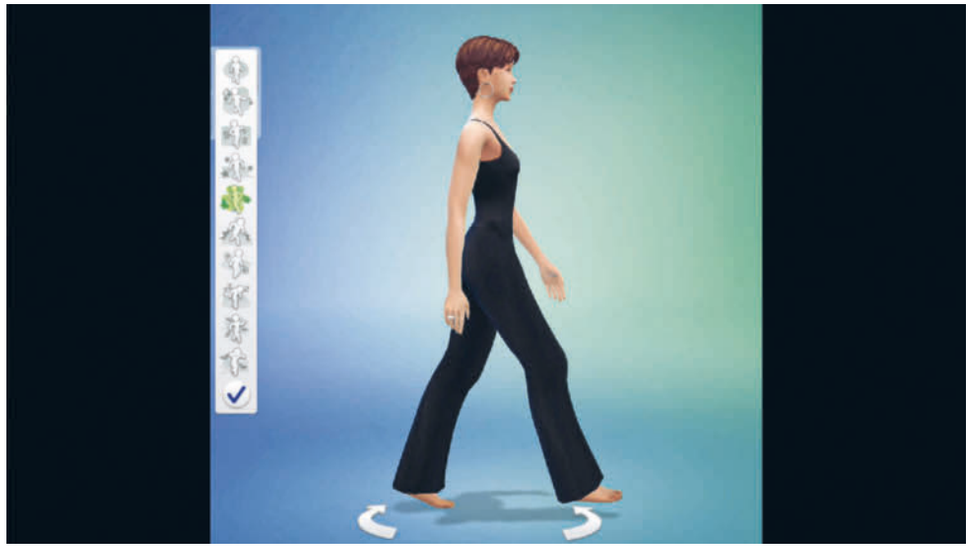
Secondly, the result of a creative act is *new*, which refers to the fact that no identical copy exists. What is new can be determined only by reference to and demarcation from something preceding it. The new does not arise out of nothing, it is constituted relationally. The will to creativity presupposes dissatisfaction with what exists. It arises from the desire to question the existing, to insert a critical question mark and to design something new: the world is to become a different one. Creativity is always also implicit or explicit criticism and resistance against old, handed-down tradition.

Thirdly, the result of the creative act has a value that is *meaningful*. This is a decisive characteristic: it is not an arbitrary result that is evaluated as creative, but it corresponds to certain expectations or the norms of a certain discourse context that consider it to be qualitatively valuable.

I would like to explain three types of creativity on the basis of Margret Boden's valuable distinctions.[6] These three types of creativity differ in terms of the degree of novelty, i.e., in terms of distance from the given, which is present to varying degrees. These three types of creativity all fulfil the previously mentioned characteristics of unexpected, new and meaningful. They are not an alternative proposal for labelling creativity, but indicate the extent to which the creative act generates novelty. Is it through the recombination of known elements (combinational), through the exploration of a still existing element (exploratory) or a complete new beginning that radically breaks with its previous history (transformational)?

The new pieces sound similar and familiar, but they are not copies.

The first type is *combinational* creativity. It refers to the recombination of already existing elements into something new. I would include AI software like AIVA[7] or Jukebox[8]; these programmes analyse large amounts of data and recombine them into new pieces of music. The new pieces sound similar and familiar, but they are not copies. Jukebox is a neural network that generates music and also creates vocals in a wide range of styles. It is also possible for Jukebox to compose a complete piece of music based on a few sequences of notes. The Bilderatlas Mnemosyne by Aby Warburg combines existing pictures and arranges them in new contexts. Collages also function according to this principle, recombining



↑ **Fig. 2 Kim da Motta, *How would I walk, had I never seen a woman walk?,* Bachelor's project for Lucerne School of Art and Design, 2022**

existing elements into something new. Examples can be found in the works of Pablo Picasso, Georges Braque and Max Ernst.

The second type is *exploratory* creativity. It explores and stretches boundaries found within an existing style. However, there is no radical break with what has gone before; rather, a dynamic further development takes place. In the visual arts, Pointillism can be understood as a further development of Impressionism. It is a radicalisation within the existing style. Another example of the continuation and exploration of a style is Mannerism, which explores the forms of the late Renaissance and takes them to their limits.

The third type is *transformational* creativity. This describes a radical break with existing works and a departure for new shores. In the visual arts, these are upheavals that involve rebellion and new beginnings. No further development of an existing style, but a disruption of previous conventions. Dadaism rejects conventional art and is directed against handed-down traditions, constituting an act of rebellion against the bourgeois value system of art. The punk movement can be interpreted in the same way; it does not continue along the existing paths but breaks with previous conventions.

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Artificial intelligence and artistic practice

New artistic practices are emerging that use the new technology of artificial intelligence as an experimental tool to extend artistic activity and to create or expand new digital design spaces. Data is the material basis for artists to create new visual artefacts based on the modification and manipulation of data or training datasets.

... AI and its fields of application can be critically questioned through artistic practices.

The third type is *transformational* creativity. This describes a radical break with existing works and a departure for new shores.

In addition to its function as a tool, AI and its fields of application can be critically questioned through artistic practices. AI is not a tool here, but an object of investigation to explore the socially relevant effects and implications of AI. The aim here is to reflect on a critical relationship to this new technology and to make it visible through artistic practices. Kim da Motta's final project in the Camera Arts Bachelor's programme critically examines the practice of biometric recognition based on a person's gait, which not only identifies individuals based on their gait, but also makes a binary categorisation according to gender. The work criticises the stereotypical binary gender categorisation, due to the dearth of diverse data material used to train the algorithm. Kim da Motta's artistic work highlights the fallacy of ‹discrimination-neutral› practices, which are a reflection of social reality; they reproduce bias and contain distortions and discriminations.[9]

Another way to apply AI in artistic practice is to use AI tools to produce artistic artefacts through language. The output is controlled through the input of words. The AI application Midjourney[10] produces four different images based on language input. This initial input triggers the visual generation of images. The results are amazing. New visual worlds are created on the basis of data without having to resort to human abilities to imagine new worlds, impressions and moods. Certainly, one can also state that the AI artworks reproduce already existing artistic styles and explore them only in part. However, it is highly doubtful that they might also possess transformational power, i.e., that they radically question what already exists and advance into new dimensions of artistic creation.

Human and artificial creativity – an outlook

The examples show that AI applications such as Midjourney and DALL-E 2[11] have advanced into previously unimaginable new dimensions of creativity through machines. The debate on creativity can be boiled down to the following question: what distinguishes human creativity from artificial creativity? A provisional answer looks like this: The difference is that human creativity resides in a body that is connected to the world through its senses. Moreover, every human being has a subjective approach to the world because of their history, their origins, their thinking. Art is the result of a continuous confrontation with the world, with material, with other people and also with the history of artistic practice.[12] Moreover, creative work has a meaningful dimension; it does not come about at the push of a button, but through effort and passion. Creativity, understood as a mental process, takes time, it is integrated into a human discourse and value context, which in turn is the basis for the evaluation of creative achievements. Machine-made art operates with data instead of passion, so that AI will be able to imitate and extend humanly produced art ever faster. What does this mean for art and human beings? Is AI merely a useful tool that will eventually become part of artistic practices? Or are we facing a revolution that will require a radically new approach to art and creativity and, in turn, change human beings' role in the world?

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How is AI changing art and design education?

The technological development of AI and the new areas of application in the field of creative work also requires a change in art and design education: the teaching of digital competences should be given even more weight; in particular, programming skills should be taught. It is crucial that students understand how AI works, in order to be able to use it as a tool, to critically reflect on its social impact, and to visually implement it in artistic works. The bases for this training are critical thinking and the understanding of ethical and philosophical debate about this new technology. Accordingly, these skills should be deepened as well; they are increasingly the basis and prerequisite for critical reflection.

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↓ **Fig. 3 Kim da Motta, *How would I walk, had I never seen a woman walk?,* Bachelor's project for Lucerne School of Art and Design, 2022**

1 Max Tegmark, *Life 3.0. Being Human in the Age of Artificial Intelligence*, New York 2017, p. 53.

2 Marcus du Sautoy, *The Creativity Code. How AI is Learning to Write, Paint and Think*, London 2019.

3 Hans-Ulrich Gumbrecht, *Kreativität – Ein verbrauchter Begriff?*, Munich 1988.

4 Andreas Reckwitz, *Die Erfindung der Kreativität. Zum Prozess gesellschaftlicher Ästhetisierung*, Berlin 2012.

5 Hanno Rauterberg, *Die Kunst der Zukunft. Über den Traum von der kreativen Maschine*, Berlin 2021, p. 30.

6 Margret Boden, *AI. Its Nature and Future*, Oxford 2016, p. 68.

7 https://www.aiva.ai

8 https://openai.com/blog/jukebox/

9 Orlando Budelacci, *Mensch, Maschine, Identität. Ethik der Künstlichen Intelligenz.* Basel 2022, pp. 118–125.

10 https://www.midjourney.com/home/

11 https://openai.com/dall-e-2/

12 Richard Sennett, *The Craftsman*, New Haven and London 2008, pp. 119–146.