The Next Rembrandt,
3D-printed painting created using neural network algorithms,
2016

The Next Rembrandt team comprised 20 data scientists, developers,
AI and 3D printing experts, organised by Microsoft and supported by
Dutch bank ING and marketing agency J. Walter Thompson.
A facial recognition algorithm identified and classified the most typical
geometric patterns used by Rembrandt to paint human features.
It then used the learned principles to replicate the artist's style and
generate new facial features for the painting.
See www.nextrembrandt.com for details.

AI & Myths _of_ Creativity

Lev Manovich, Director of the Cultural
Analytics Lab in New York and Los Angeles
and Presidential Professor at the City
University of New York, explores some of the
societal notions surrounding AI and creativity.
He exposes certain myths that have grown
up around this discourse and posits a wider,
more interesting emerging reality.

Current discussions about the adoption of AI in visual arts, design, architecture, cinema, music and other arts often rely on widely accepted ideas about art and creativity. These include such notions as 'Art is the most creative human domain', 'Artists does not follow rules' and 'Generation of original art is a great test of AI progress'. The goal of this text is to briefly discuss the historical origins of popular ideas about art and creativity, and suggest that they limit our vision of cultural AI.

Art as the Embodiment of Creativity

Our dominant concept of art comes from the Romantic period in Europe: the end of the 19th and first part of the 20th centuries. The idea goes like this: artists are different from normal people. They occupy a special place in society. Their art comes from the inside, from their imagination and not from any rules or examples. It is not a result of rational decisions. Instead it is driven by intuition and it expresses emotions. And, most importantly: art is the exclusive domain of human creativity.[1] (The term 'creative industries' is one example of how the Romantic association of creativity with art is now taken for granted in society.)

The assumptions that art, as opposed to any other field of human activity, best embodies creativity, and also that art is the best expression of human uniqueness, lead to the following seemingly logical conclusion: *the best test of the progress of AI is whether it can generate (novel) art.*

Here we encounter a fascinating paradox. In the 19th and first part of the 20th centuries, it was still assumed that artists need to train for years to acquire specialised skills in drawing, perspective, composition, etc. But as the ideology of modern art based on Romantic ideas gradually became dominant, the requirement of learning such skills also disappeared.

Since 1970 the contemporary art world has become conceptual, ie focused on ideas. It is no longer about visual skills but semantic skills. Although art now focuses on communicating semantic messages, for a while it still valued Modernist ambiguity and wanted audiences to struggle with interpretations. However, by the start of the 21st century, as contemporary art entered mainstream culture and groups of schoolchildren became frequent museum visitors, art could no longer afford to be 'difficult' or ambiguous. Similarly to how it functioned before the 20th century in the West, today art again serves moral and political functions.

There are only a few art academies in China, Korea and Russia that still systematically teach 19th-century traditional drawing and painting skills. In most art schools and university art departments oriented towards the contemporary art world, students are told to start 'expressing their inner vision' and 'developing their unique' style right away. Instead of art-making skills, they learn the verbal language of contemporary art as it exists in the statements of artists and galleries, and the texts of critics and curators in catalogues and other publications.

To be an artist who belongs (or wants to belong) to the contemporary global art world is to speak and write in this language, rather than to posses any skills in colour combination, composition, drawing, photo and video editing, 3D modelling and animation, computer programming, or game design. This ideology also defines how art is viewed in global culture at large. Art can express unique 'artistic visions', or 'play some special role', or 'address social issues', or 'question' dominant social values. But it is not about involving any specialised skills, or creating beauty, or expressing and arousing emotions. These functions have been fully taken over in the 20th century by mass culture such as cinema and popular music – and today also by social media where millions of people showcase their fashion looks, photographs, manga drawings, 3D characters and other creations.

However, semantic art has never completely taken over visual arts. In endless galleries, museums, art websites and social media galleries we continue to see figurative, semi-figurative and abstract images. They do not communicate any obvious linguistic messages. They employ all the visual languages developed in the realist 19th and Modernist 20th centuries, and they can be situated anywhere between realism and abstraction. They do not innovate visually, because after the Modernist century (1870–1970), there is nothing left to invent. (And new effects enabled by Photoshop and other media software in the 1990s have by now become part of the Modernist legacy.)

This kind of visual art is everywhere today, while a more specialised world of contemporary high art is less visible. Most people feel too intimidated to even approach contemporary art museums.

This is why for people who do not have expertise in the art world, contemporary art is equated with 19th-century realism and 20th-century Modernism – ie two-dimensional images that represent something in either a detailed or schematic way. And this is why so much effort in AI research is now devoted to automatically generating images that look either like realistic works from past centuries, or abstract and semi-abstract works from the 20th century (as opposed to, for example, installations, site-specific art projects or other recent types of art). For AI researchers and also the general public, such images are equated with art. That is, their visual similarity to what popular culture labels as 'visual art' is assumed to be sufficient. And this is why the use of AI methods in interactive art or experimental music does not fascinate the news media or the public – because this kind of art is not popular with the general public, unless it is promoted by Google as the latest AI art, or has a purely entertainment function.

Art and Realism

As demonstrated by many research studies in the social sciences, for the majority of people today art indeed means pictures, realism and skills.[2] An artist is understood as a person who has skills to make figurative 2D images, professional-looking photographs, animated 3D models of human figures, manga drawings, and other figurative representations that are hard or impossible to make without a long period of training or practice. Search for 'art' in Instagram or on YouTube, and you will come across endless tutorials, guides and courses on how to acquire such skills.
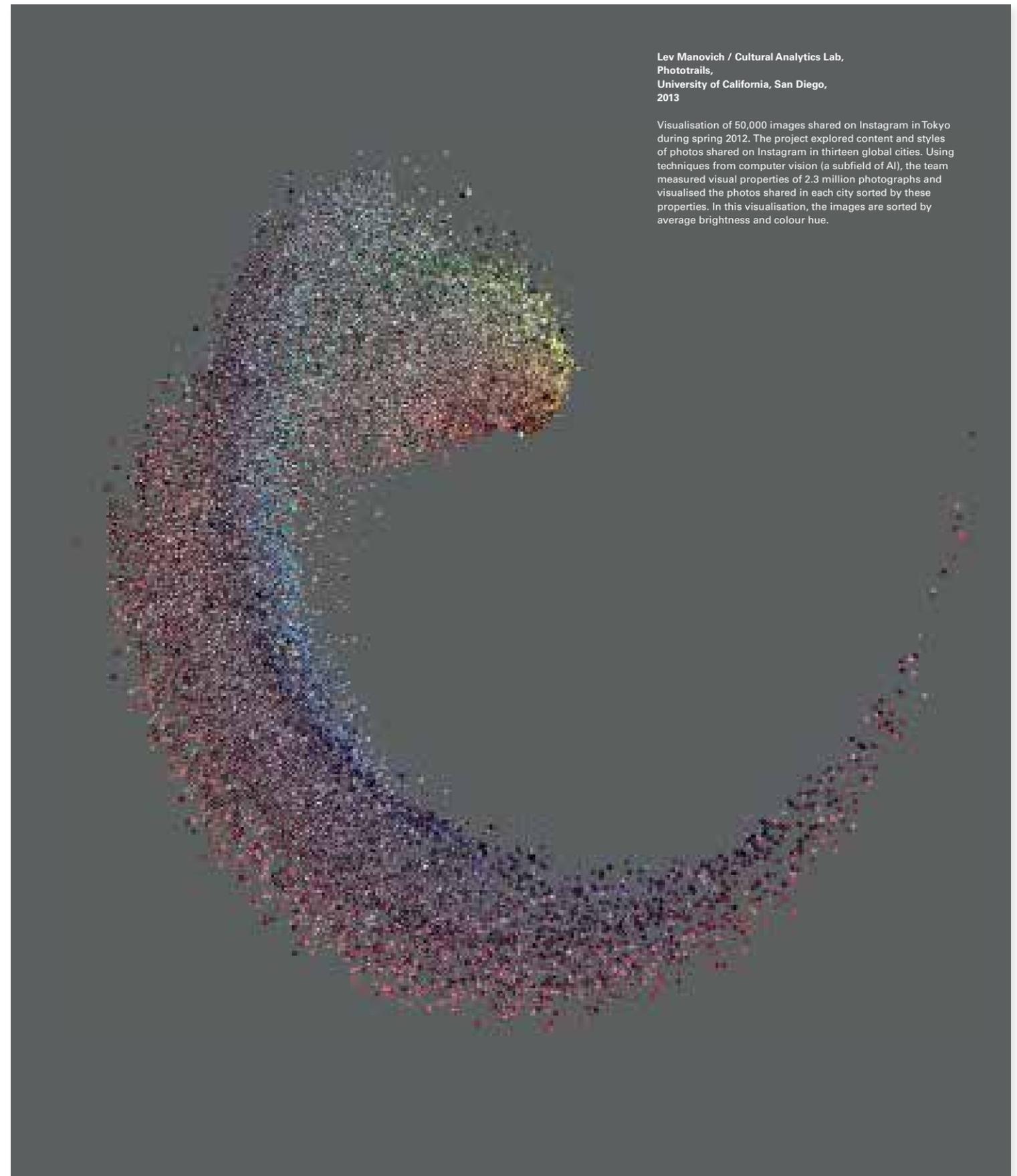
The idea of specialised skills that need to be mastered also defines all areas of the culture industry – professional photography, anime and animation, game design, web and interaction design, cinematography, video editing, acting, TV and film directing, music production and so on. Often when professionals from the culture industry are evaluated, the idea of learning skills and achieving technical mastery is combined with the idea of high creativity. For example, if a very successful culture industry professional is referred as a 'real artist', this assumes that he or she has both superb mastery of the craft and also highly original style and/or content.

This commonly held view of art explains why realistic images, similar to the ones of great artists from the past, that are generated by AI receive the most media attention today. People are very impressed when a research team has used AI to recreate destroyed parts of Rembrandt's *The Night Watch*,[3] or when a student has used AI to create images that look like classical Chinese landscape paintings to the extent that they fooled 55 per cent of participants in an experiment.[4] But an AI that can make abstract art does not make news.

In an experiment conducted by the Data Science Lab at the Institute for Basic Science (IBS) in Daejeon, South Korea in spring 2021, a group of people without any art training were shown both realistic and abstract images, and asked to judge whether each image was made by a human artist or AI. Images which had a significant level of detail were most frequently assumed to be made by human artists, while simple abstract images were assumed to be generated by AI.[5] In reality, all the images in the experiments were generated using a recent StyleGAN2 neural network model that was trained by the scientists on tens of thousands of historical paintings from the wikiart.org site.

Creativity and Global Economy

Yet another relevant idea taken for granted today is a relatively recent one that became popular in the early 2000s. Global competition and easier access to foreign markets as part of economic globalisation have motivated a new paradigm in business. Your company now needs to be 'creative' and it needs to innovate constantly. The global success of Apple and Samsung in the 2000s, based on their innovative strategies has become an example for all businesses.

The highly influential book of urban theorist Richard Florida, *The Creative Class* (2002), also played an important role. According to Florida, the economic function of this class is 'to create new ideas, new technology and/or creative content'.[6] In his analysis, the creative class already included 30 per cent of the US workforce by the early 2000s.[7] Florida argues that cities that can attract this class will prosper. His work had a big effect. For example, the leaders of Berlin were influenced by his ideas and in the 2000s set up policies to attract professionals in design, software and media from other countries to the city.

Still later, the idea took hold that creativity is highly desirable for society as a whole and individuals in general, and became a new universal social value in the 2010s. Everybody should be creative – and computer technologies

Perceived as
AI-Generated
Human-Created

Assem Zhunis and Lev Manovich,
Images generated by StyleGAN2 neural networks
trained on 81,000 paintings from Wikiart.org,
Data Science Lab,
Institute for Basic Science,
Daejeon, South Korea,
2021

These images were used in an experiment where people were asked to guess if each was created by a human artist or an AI. Most responders assumed that realistic images shown in the bottom row came from human artists, while simple abstract images shown in the top row were created by AIs.

are here to help us. (Which means that we all, to some extent, should become 'artists'.) A new term 'creative technologist' that became popular in the 2010s is an example of these trends.

This idea led to a different assumption – that AI and technology in general should help individuals and companies to be creative and innovative. Now, we no longer want AI to only simulate human cognitive functions such as vision, speech and reasoning, or to quickly search through millions of documents or translate between languages. This was enough in the 20th century – but not the 21st. Now we want AI to generate creative and innovative solutions or help us to do this – because society assumes that creativity is the driver of the economy.

Dissociating AI and Creativity Concepts

All this means that in the future, when our ideas about art, artists and creativity will change (there is no reason why they should stay the same), the link between AI and the arts that now seems obvious may also become weaker or disappear. And this will be a good thing. I am personally looking forward to this. The proportion of creative people in the arts is no different from that in any other field of human activity. Although the templates, examples and tactics used by many contemporary artists, designers, architects and other creatives today may not all be as explicit as Lightroom® presets or WordPress® themes, they are no less real.

The association of the arts and creativity that we take for granted today, and the privileging of creativity over other considerations, are relatively recent inventions. Thus, rather than obsessing over the question 'Can AI be creative?', we should explore other ideas about what AI can do for art, design, architecture and all other art fields. ⌀

Notes
1. See Aidan Day, *Romanticism*, 2nd edition, Routledge (London), 2012.
2. See for instance Roger Batt *et al*, 'Style and Spectral Power: Processing of Abstract and Representational Art in Artists and Non-Artists', *Perception* 39 (12), 2010, pp 1659–71.
3. Cristina Criddle, 'Rembrandt's The Night Watch painting restored by AI', BBC News, 23 June 2021: www.bbc.com/news/technology-57588270.
4. Alice Xue, 'End-to-End Chinese Landscape Painting Creation Using Generative Adversarial Networks', 11 November 2020: http://arxiv.org/pdf/2011.05552v1.pdf.
5. Gabriel Lima *et al*, 'On the Social-Relational Moral Standing of AI: An Empirical Study Using AI-Generated Art', *Frontiers in Robotics and AI* 8, August 2021: https://www.frontiersin.org/articles/10.3389/frobt.2021.719944/full.
6. Richard Florida, *The Rise of the Creative Class: And How It's Transforming Work, Leisure, Community, and Everyday Life*, Perseus Book Group (New York), 2002, p 8.
7. Richard Florida, *The Rise of the Creative Class – Revisited: 10ᵗʰ Anniversary Edition*, Basic Books (New York), 2012, p vii.