Hello World. Artificial intelligence and its creative potential

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Unavoidably, we encounter new technologies daily and often we don't even consider how strongly they affect our lives. According to the data of the *Rescue Time* app, which we can install to track our time spent on the phone, the average time spent is three hours and 15 minutes per day (2019). This statistic does not include the time spent in front of a TV, tablet, or PC screen. In the age of technology, all of it is an inseparable part of our daily life. Our movement and communication are freeing themselves from linear processes and become more active, faster, and more efficient than ever before. Not only the definition of time, but also our concept of space is changing. We can communicate without even leaving our bed.

The Internet is an unquestionable symbol of my generation and an effectively used guide. Towards what distant technological discoveries can we turn our attention? In my opinion, one of the most interesting developments is Artificial Intelligence (AI) and its increasingly active implementation in various fields. In 2015, during a conference organised by the *Future of Life Institute* in Puerto Rico, professionals of various fields split into two groups: those who believed in an unbelievably fast and real opportunity for artificial intelligence to turn into a communal project, which will be able to complete all human tasks (to feel, or create according to Demis Hassabis from *Google DeepMind*), and those who held onto a more critical point of view and expressed many doubts concerning the progress of this technology (i.e., Elon Musk).

Everyone's individual encounter with the prominent algorithms forms certain points of view. The use of AI via easily accessible software – such as *Siri* or *Alexa* – can form an image of an "executor" or a "professional *Google* user". However, is AI only capable of this much? To complete simple and clear instructions and to answer: "I didn't get that, could you try again?" (Thank you, Siri, I am trying).

Examples showing the improvement of AI can be found in various fields. Also, more often we can see the notice "created by artificial intelligence" next to works of art. An art exhibition that took place in 2018 in Delhi invited artists who work and create in collaboration with AI. Here, for the first time within the space of a gallery, a painting authored by a non-human was presented. However, does AI understand how and why it creates? Can we see similarities between our imagination and the creative

processes of AI? Is there room for imagination in this algorithm and what challenges and changes await us with AI entering our society? Can it behave creatively and create something truly new? By analysing examples of AI, I am aiming to gain a greater understanding of its principles of operation and existing creative potential.

Artificial intelligence creations in the fields of art

Design. Designers were some of the first to employ AI help in their field. This decided the appearance of a *generic design*. How it is exceptional and what potential it provides for designers and consumers alike we can grasp by analysing one of the objects – the first AI-designed chair, which was created by the software *Dreamcatcher* in 2016. Human measurements were input into the software, such as the height of the chair and what weight it should hold. Also, keywords "Scandinavian style" were provided as well. All the other decisions were sub-coordinated by the software, and in a few minutes, there were hundreds of sketches available to choose from. This chair – *The Elbo Chair* – stands out with its forms and reduced manufacturing costs, and the design is remarkable for its skeletal structures and dynamic lines. The *Dreamcatcher* not only creates a useful piece of furniture or a thing; it employs all of its accrued knowledge – its libraries of ideas and images – and offers new solutions. These can be considered a creative act, albeit one still conditioned by humans and decisions made by them. The final variant is still at the mercy of an individual, just like the reasoning behind it. However, AI has designed numerous options in a far lesser amount of time than any human could do. Also, such a rich selection can satisfy almost any taste.

Poetry. Better language model (GTP-2) is one of the most advanced algorithms in the field. From 2015-2018, almost 32,000 articles were published in the USA, all authored by AI. In China, the number is even greater, almost 34,000. Articles were primarily of a factual nature, announcing sport results and similar content. Also, more and more journalists use writing suggestion software. Not only does it choose the correct case and correct grammatical errors, but it also finishes sentences, paragraphs, and does so not only logically, but sometimes by surpassing the abilities of the human author. Similar insights we can detect in John Seabrook's article in *The New York Times*: "And yet, sitting there at the keyboard, I could feel the uncanny valley prickling my neck. It wasn't that *Smart Compose* had guessed correctly where my thoughts were headed–in fact, it hadn't. The creepy thing was that the machine was more thoughtful than I was".

However, AI is used not only for writing articles. Language training models are trained in literature as well, for example, poetry. Truth to be told, these creations, particularly narrative stories, aren't especially complex. In prose, we can notice logic errors or even leaps of thought. Still, experiments conducted have shown that even professional writers cannot distinguish with 100% certainty the result of human creation versus machine creativity. Numerous poems generated by AI are already turned into poetry compilations and end up as books. The *Transformer Poetry* book was published in 2019. Its initiator – Kane Hsieh. This book consists of 26 classical poems, by recognised authors, regenerated using the GPT-2 model. Having just a few lines of the original poem, the algorithm interprets and generates the remaining part of the poem. Here's one example (the boldened part was the excerpt of the original poem, the rest – created by AI):

HOWL
Allen Ginsberg

I saw the best minds of my generation destroyed by madness,
starving hysterical naked,
dragging themselves through the negro streets at dawn looking for
an angry fix,
The madman's hands, the maniac's mind, the mind that takes
nothing human
as an object of delight, and the lunatic's body, or any other
living thing for the time...
And so I looked. I walked in a kind of cold madness through
streets I knew,
and I felt the mad passion of human weakness and decay;
I felt it so well that I did not feel much. I stood here, this evening,
when the streets
were dead still with the sound, I stood up at last

Music. In 2019 the first pop music single made by AI, which was the centre of many discussions, was released by Sony. In my opinion, this creation was hardly identifiable as pop music, however, it can work as an artistic experiment. We can test the AI potential on Google as well. *AI duet* invites human musicians to play together with musical instruments and to improvise in real-time, and *N Synth* offers

possibilities to create new and unique instruments, mixing the potential of other instruments. For example, we chose 70% percussion and 30% flute sounds, and we got the "flutedrum". The number of variations is infinite and depends on our choices. Mary Flanagan, a famous poet and scholar of humanities has noted, that humans are already capable of creating a good sonnet, so why not use the machine not for the recreation of sonnets, but for creating something new?

One of the more interesting *Google* experiments is called *Imaginary Landscape.* The operating principle is simple – you upload any image or photo, and the AI creates a one-minute-long music track for that image. While experimenting freely with this software my attention was drawn not only to the precise evaluation of objects and their materials, but also the sound representation of objects that *could* be there but are not visible in the photograph. For example, for an empty playground AI assigned the sound of children's shouts. This interpretative moment, multi-layered seeing of image, assignation of meaning, and combining of different media is a creative dialogue, that is already occurring between a man and a machine.

Painting. In 2018 the aforementioned first exhibition dedicated to AI and its use in creativity took place. The now-famous work of art *Edmond de Belamy* was presented there along with other seven interdisciplinary artists' collaborations with AI. In the previously mentioned painting, numerous discussion-worthy elements can be seen. If a machine only repeats what humanity has already achieved and overachieved long ago (the work is significant for its imprecise strokes and abstract lines), why do we see such a strange decision to leave an empty, unpainted area on the canvas? Also, the composition is concentrated on the left. That is not regular for the works of the period (15 – 18 c.) for which the algorithm analysed and generated. Usually, we understand the work of a machine as complete, thus such delivery can be interpreted as an error or as a creative gesture – the machine's choice to act not according to the rules, meaning to consciously break the rules in the name of the concept.

The painting discussed is just one from the *Obvious* team's creative collection. In total, there were eleven portraits generated. This *dynasty* family tree they created from eleven portraits can be interpreted as the painting genesis of that period and the distinction of the most common features or the study analysis of a progressive artificial intelligence. Either way, this painting had drawn great attention and was sold for $432,500 USD. It looks like AI is moving into the art market despite the deeply deposited controversy.

Imaginative coherence of the generative adversarial networks' operations

To create *Edmond de Belamy,* GANs (Generative Adversarial Networks), a machine training network started in 2014,was used. Ian Goodfellow, with his team, provided new meaning for this learning process. The main elements in this network are the generator and the discriminator. They work by generating material and comparing it with real samples, and the purpose of this scheme is to designate and identify the "fake" (the generated output) as "a true and correct image." By completing the task, GANs can create a third, new value.

The principles in which this scheme works are precisely explained by the *Obvious* team example, which we can find in their manifesto: "Take an art student. His professor asks him to paint a Picasso. The student doesn't know what a Picasso looks like. So he will start painting, in order to see which direction to go. Every painting he makes is judged by the professor. With time, the student gets better and better at painting Picassos, and at the end of the process, the professor can't tell the difference between a real Picasso and one that has been produced by the student. At this point, the student is capable of creating new examples of Picasso paintings, at least at the eyes of the professor." This would represent the GANs system's training and product, which it is capable of creating.

This *Obvious* example is reminiscent of the still unknown number of the infamous forgeries, created by a German couple, Wolfgang Beltracchi and his wife Helene. M. Ernst's *La Foret* forgery is considered the most profitable forgery affair in history. Instead of an attempt to forge already existing works of art, by mastering the artist's painting technique, they began painting new works, which were then then presented as having been accidentally discovered and purchased originals. This story can be an illustration of how the GANs scheme works.

The operation principle of the network is also tied to the way imagination works. The correlation with the operations of the neural network can also be seen in M. Heidegger's formulated three phases of time explaining the development of imagination: "reception of data into oneness within observation intuition (apprehension) delivers the motion of contemporariness, regeneration of images (reproduction) is like a reminiscence of the past, and recognising by using concepts (recognition) greets us like the future". By seeing the inherent connections, we bring AI actions closer to our own act of creation, if we say we are capable of bringing about formulas of imagination and creativity. The moment of receiving data guides

us to the algorithm's material selection, the generator delivers reproduction, and the discriminator – recognition. The future is achieved – a new creation.
AI, just like a human, has to make decisions during the creative process and has to experience that unavoidable moment of renunciation for the sake of creation. The amount of input data has to pass the selection to become the adapted and desirable output, that which we consider a work of art. That is one more structural similarity between the functions of human imagination and GANs. "Mental and physical clichés exist – premanufactured concepts, memories, imaginations. That is a very important part of the painter's experience – even before beginning the canvas is already loaded with objects of all categories, which can be identified as "clichés". That is dramatic." [Deleuze G., *Desert Islands and Other Texts 1953-1974*, 2002]. Therefore, the creator has to be capable of critically evaluating their imagery and other experiences and rejecting them for the realisation of the work of art, so that a conscious act of will takes place, leading to a result. However, AI, even when completing the tasks of rejection and separation, cannot grasp it. "For now, it does not understand what it is doing, whatever significance it may give to its words" [Tegmark M., *Life 3.0*, 2017]. Assigning meaning (or that how we understand "meaning)" is still taken care of by the human.

Stimuli that are occurring, along with parallels appearing between man and machine's creative processes, empower us to notice the templates of operation within us. Upon acquiring sufficient knowledge and by converting it to algorithms, we could instil these algorithms into the machines. Maybe we truly are just a sequence of algorithms ourselves, endless and improving. But to be able to discover the algorithm, to be capable of creating and competing with humans in the fields of art, we have to analyse art digitally and adapt objective measures for it. "We cannot design an algorithm in such a way, for it to create a "good song" or for it to find them if we cannot define what is a "good" song. <...> How to evaluate the aesthetic value of the work of art?" [Fry H., *Hello World*, 2018]. Training of the creative algorithm is slowed not just by the search for the objective criteria, but also by the attempt to adapt them in numbers, and to discover statistical methods, which would decide the material's aesthetic quality evaluation measure's appearance and application. AI is yet again directed towards a repetition of human abilities in art, aiming to gather a sufficient amount of data and to find a starting point for the algorithm in the field of art. In M. Valatkaitė's article about I. Pavliukevičius's exhibition "Heart Resistant to Water", the same doubts are raised: "When the doubt is planted whether contemporary human existence is real – occurring within natural,

accidental conditions, or whether it is an artificially created one – based on computer calculations, it brings us closer to the leitmotif of Pavliukevičius's exhibition, which encourages us to think about the similarity between that which is real and what is artificial". If we cannot define the concept of art, can we say who the creator is? Without being able to define the aesthetic value of the work of art or its significance, can we say, that AI creations are not works of art? I retain the right to doubt.

Hello World

"Which goal do you want to pursue first?
I'm just beginning to think about that. I'm not sure yet, but I like the possibilities"
–Artificial intelligence monologue from talktotransformer.com

The self-portrait genre formed as an opportunity to use your own skills and to create and reveal a personal, inner world. The self-portrait shows not only how the artist sees him/herself, but also how he/she wants to be seen. The author constructs their own identity. Also, I am intrigued by one of the reasons for the appearance of the self-portrait – the aim to recreate and preserve the myth of the artist as a genius.

This portrait is a self-representation of AI. It is conditioned by my intentions to reveal its creative potential and to share imagination about artificial intelligence's ability to become an independent and the only creator of art, thus leaving the human to one side, in the position of an audience. An algorithm is used (*image scraping*) and GANs are used to create the portrait. There are conditions for it: an automated input search (artists' self-portraits are searched), supervised learning (use of GANs software), and an endless generation of output. This action of self-portrait creation is constant – every 25 seconds we see a newly generated portrait. The process does not develop into a single result. Instead, we are forced to experience visuarrhea [Sabolius K., *Furious Sleep* (Lith. *Inirtingas Miegas)*, 2012]. We are overloaded with images and changes between them. It represents the continuous learning of AI (generating selective human experience) and refers to certain challenges, which we possibly experience in our life: attempts to fit in society, to realise a desire to become better, to be "enough", to form an advantageous personal image, which would allow us to compete in chosen fields, for example, in the field of art. This creation of an identity and positioning of oneself is reminiscent of Z. Bauman's analysed aim for utopia, the concept of which changes from "a good place" and becomes "a good path", meaning an endless journey to utopia: "<…> for a modernist there is no such thing as the end,

mission accomplished, meaning that the objective and the feeling have been accomplished and now it is time to enjoy it. Each episode is experienced as an introduction for the next one" [Bauman Z., *Culture in a Liquid Modern World*, 2011].

In these generated portraits, we can observe trends. The subject is thoughtful and dismal, and most portraits have acquired masculine features. These similarities of GANs portraits are like an objective analysis of artists' self-portraits. It raises many questions about how the artists tend to represent themselves, what general features are distinguished, and what style they choose in order to do so. Romantic portraits appearing in the hologram remind of the primary purpose of the self-portrait that was established in the painting tradition – to recreate and maintain the myth of the artist as a genius. Also, these series of portraits reflect the naïve understanding and hope that AI will be capable of not only achieving the level of our intellect but also surpassing it.

The title *Hello World* refers to an important change in the field of programming – an opportunity to exchange messages with a computer by the use of a programming language. This step marks the first symbol of the dialogue between a human and a machine. About the "connection in which there is almost no boundary between the controller and the controlled" (Fry H., *Hello World*, 2018]. In this situation of a creative piece, AI has become the initiator of communication awaiting a human response.

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