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CREATIVE ROBOTS

Abstract | We live in times in which is growing importance of artificial intelligence and the expectation of increasingly intelligent systems. As artificial intelligence and intelligent robots take over human various functions, there are questions about the sort and scope of their activities in relation to human capabilities. This process raises the question, do we can identify such spheres of human activity, that cannot be replicated by intelligent programs or robots? It seems, that such properties are human emotions, sensibility and creativity. In this article I analyze whether intelligent robots could be artistically creative and if could replace in this process a human? The thesis of this article is, that although it is difficult nowadays to indicate innovative creative robots, it is really difficult to denied, that intelligent robots are not creative in some sense, and that they make an art. There is the perspective, which emphasizes that today's human nature is not copy able in this sense by robots and artificial intelligence. We also try goes to the outside of homocentric attitude, assuming that creativity is not owned, but the property of the human, and when we talk about artificial intelligence, it is possible today to allow it a certain kind of creativity.

Index terms | *Creation; artificial intelligence; reproduction*

One of the merits of creativity is that it has become a focal point, and thus a point of access, for transdisciplinary research in fields including cognitive psychology, design science, and artificial intelligence. Contemporary AI recognizes creativity as an attribute that is highly desirable in artificial systems yet poorly defined and poorly understood.

Mitchell Whitelaw, *Metacreation. Art and Artificial Life*[1]

Is it possible to come from that position and still believe in the possibility of machine creativity? Certainly! I believe that my dialog with AARON is an example of machine creativity, albeit a small one.

Harold Cohen, *Driving the Creative Machine*[2]

If you could talk about creativity[3] with reference to artificial intelligence and robotics, you should basically pre-define the characteristics of this phenomenon which is seen from that analytical perspective. Furthermore, such a question should be referred to questions as e.g. whether intelligent robots are in the capacity of understanding at any level or even differently than the human mind does so what the nature of art and creativity are, and/or whether you could even await the emergence of such a phenomen as creativity in intelligent and non-biological beings? And then you need to examine whether or not this phenomenon is an exclusively human feature and intelligent robots owing to the human powers could only mimic their artistic process? Let us imagine a software designed for painting in the styles of Jackson Pollock[4] or Pablo Picasso[5]. It is an easy task for a chosen algorithm to learn to paint in one of those styles mentioned earlier. However, it is not a creative action in terms of innovation as the software was designed in order to follow patterns of abstract expressionism or cubism, and as such it is beyond its capacity to create a new painting style, though it still could paint new and good paintings in Pollock's or Picasso's styles. Such a software solution shall remain "passive", because it still fails to use a feature or structure which could allow to cross the boundaries of imitations and replications and adopt the powers of innovation and novelty.

Firstly, we need to define the term "creativity" as a process of creating new art forms emerging only from learned and/or programmed art style, imitation, copying an artwork. Intelligent art robots are creative in the sense that they are capable of building e.g. different images. Their job is to adjust a new art form to any general template, which should, undoubtedly, have certain concrete parameters and saved instructions in the database and algorithm of the software.

Secondly, we speak of "creativity" applying the term with reference to originality and novelty of the work of art. This type of creativity could be linked with more sublime phenomena, that is the case when a totally new qualities in the work of art could be visible which have no parallel in the history of art. Such a creative approach could be linked to solving a certain art problem, either formal – i.e. creating a new art style – or conceptual – i.e. revealing in a unique way a new vision of reality. If this is the case, we may expect major changes in art leading us to discover new deeper dimensions of art. However, I suppose that this level of creativity is unattainable for an intelligent robot.

In this above mentioned case of the artbot-copyist you may inquire whether or not its actions are similar to human copyist? While scrutinizing the problem from the cognitive sciences' point of view you could note that both cases involve biological or technological Optical Character Recognition (though this term seems more suitable for the artbot than human work). Juxtaposing the terms copying and creativity we mean the same situation in which human-artist and artbot take action, in other words the process of copying (and not creating). As the objective of the activity

is to copy the picture as faithfully as well as it is possible, there are no features of individual creativity, but only imitative work. The question of copying is not so emotional like the issue of creativity involving novelty and/or originality.

Therefore, you could claim that the human resembles a robot, because no creative features are present in the case of copying, and you could only admit that all you need here is the robot's perfect rendition. The analysis of the rendered copy shows no major differences between the robot's and the human's works. Clearly, the pictures could be different, but their intentional origin is the same as the purpose of the rendition is to faithfully mirror the original work. This is, notably, an additional aspect of our comprehension of art, by which I mean the human-centred assertion about the origins of the artwork. Due to unclear reasons man-made copies seem to be more appreciated than the job done by a robot. Thus, owing to algorithm development and operating systems improvements robots are likely to become better copyists than man in the future. This may resemble the transfer of knowledge from the master to their disciple, but with the reservation that robots gather and enrich knowledge continually, and then pass it in its entirety in the moment of copying data to the robot of next generation, which is *mimesis* at the ultimate level of excellence. Even though nowadays the humans could surpass intelligent and creative robots in such a way that they are unlikely to create a new type of artistic style and/or new artistic trends, they may achieve excellence in copying and, possibly, the human shall not be able to challenge them.

My point is that intelligent, artistic robots such as AARON[6], *E-David*[7], *Paul*[8], *Shimon*[9], *Emily Howell*[10], could be creative in the first meaning of the term as shown above, therefore we could apply the term *imitative creativity;* by contrast they are not creative as shown in the second definition which could be named by *innovative creativity.* This difference may show the nature of intelligent art robots and the human. However, if we open to accept the possible existence of a creative structure, which could be named *an algorithm of creation* originating from a creative human, and if we could spot and extract such a structure in the human brain, then we could build a metaphysical base for non-biological existence of creativity and generate algorithms of creativity and implement them in Artificial Intelligence.

My question is whether or not Artificial Intelligence software needs creativity and art? You may argue that this question reveals some form of inadequate homo-centered thinking with reference to non-biological and intelligent beings which could behave differently and have other needs than we, humans, do. The replies to the question above nowadays arouse a variety of views in cognitive sciences which, naturally, originate from the questions on the existence of consciousness in Artificial Intelligence. The views are different and, basically, most authors happen to accept certain assertions without making necessary efforts to substantiate them. If we presume that Artificial Intelligence robots have their own mental representation of the world, even though without easy access for humans, then we could acknowledge their creative behaviours. Intelligent robots do not create objects like artists create their artworks, therefore we could put philosophical questions about their capacities to build new intelligent beings and/or find solutions to existing problems. On the contrary, if you assume that Artificial Intelligence robots have no links to any form of consciousness, then you could comprehend their creative behaviours as imitative actions in terms of artistic permutations resulting in the creation of next works of art which shall resemble one another.

My question is as follows: *What are the facts/features behind innovative creation developed by the human or even Artificial Intelligence?* My intention is to pinpoint the claim that *algorithm of creation* originates in the creative human. This argument

in my deep conviction indicates a metaphysical base of creation and describes how the innovative creativity may look like.

In general meaning of the term creation is a type of algorithm shared by a variety of beings, then starting from the recognition of their ontological difference referring to their substance, you may ascertain novelty-driven human nature and seek metaphysical cause for such creativity. Innovative creativity originates from creative structure in man's brain, that is *algorithm of creation,* which, if found and applied in Artificial Intelligence, could operate in it in line with its essence and, apparently, develop. Therefore, you could claim that it could be easier to be a creative and innovative robot than a creative man. If this is the case, you could expect that the best artists of the future shall be intelligent robots, and not humans as it used to be so far although the genesis of creation itself remained in the human brain.

The objective of creative artbots was to show that if programmed, robots may be creative, however to a limited extent. If you could use the metaphysics of *the algorithm of creation* which originates in human brain, the innovative creativity of robots may be possible. But, the most important conclusion from the analyses of creativity above is the ontological genesis, and not ontological difference. You could imagine that we encounter a man at an early stage of their evolution, e.g. coming from the cave art paintings of Lasceaux Cave. The human nature has the power to liberate an act of creation from itself, that is I do not mean anything like an "outer software" of man, but their natural evolution and their "software" brain. My considerations imply that intelligent robots could only be imitative, but if they possess this human feature of creativity, they could be able to understand what the concept of art is.[11] It could be possible that they will trigger such a quality like unknown artists of the Lasceaux cave. By now you could argue that artistic creation should be discussed in the context of the human activities rather than in intelligent robots, however, you need to recognise that machines have some potential which is beyond human attainment, e.g. they could solve problems which man is unable to do. Perhaps there exist two natures which are slightly different, which lead to genetically inherent ability to possess and understand works of art, which makes humans different than other beings, e.g. more intelligent creatures.

References:

AARON. Homepage, http://aaronshome.com/aaron/index.html

Cohen, David. *Driving the Creative Machine*. Orcas Center, Crossroads Lecture Series. September 2010, http://www.aaronshome.com/aaron/publications/orcastalk2s.pdf

Cohen, Harold. *Colouring Without Seeing: a Problem in Machine Creativity*, http://www.kurzweilcyberart.com/aaron/pdf/colouringwithoutseeing.pdf

Cope, David. Homepage, http://artsites.ucsc.edu/faculty/cope/

Deussen, Oliver, Lindemeier, Thomas, Pirk, Sören, Tautzenberger, Mark. *Feedback-guided Stroke Placement for a Painting Machine.* [in:] D. Cunningham and D. House (Eds.), „Computational Aesthetics in: Graphics, Visualization, and Imaging". Proceedings of the Eight Annual Symposium on Computational Aesthetics in Graphics. Eurographics Association, Aire-la-Ville 2012, https://kops.uni-konstanz.de/bitstream/handle/123456789/23636/Deussen_236363.pdf?sequence=2

e-David. Homepage, https://newatlas.com/edavid-robot-artist-painter/28310/

Hoffman, Guy. Homepage containing a film with a recording of the joint concert with Shimon: *Human-Robot Jazz Improvisation*, http://guyhoffman.com/category/topvideo/

Lim, Angelica, Ogata, Tetsuya, Okuno, Hiroshi. *Towards expressive musical robots: a cross-modal framework for emotional gesture, voice and music*. EURASIP "Journal on Audio, Speech, and Music Processing". Springer Open Journal 2012:3.

Ness, Steven, Trail, Shawn, Driessen, Peter, Schloss, Andrew, Tzanetakis, George. *Music Information Robotics: Coping Strategies For Musically Challenged Robots*. 12th International Society for Music Information Retrieval Conference, ISMIR 2011, http://ismir2011.ismir.net/papers/PS4-16.pdf

Paul. Films about activities, https://www.youtube.com/watch?v=EH0WFkcZNDg

Pollard, Kevin. Blog about Emily Howell, http://www.kevinpollard.com/blog/?p=467

Tresset, Patrick, Leymarie, Frederic. *Portrait drawing by Paul the robot* „Computers & graphics", Elsevier 37, http://doc.gold.ac.uk/~ma701pt/patricktresset/wp-content/uploads/2015/03/computerandgraphicstresset.pdf

Tresset, Patrics, Deussen, Oliver. *Artistically Skilled Embodied Agents*. The Society for the Study of Artificial Intelligence and Simulation of Behaviour (AISB), 1st - 4th April 2014. Goldsmiths, University of London, http://doc.gold.ac.uk/~ma701pt/patricktresset/wp-content/uploads/2015/03/Tresset_270467.pdf

Whitelaw, Mitchel. *Metacreation. Art and Artificial Life*. MIT Press, Cambridge MA. London 2004.

Zheng, Yan, Nie, Xuecheng, Meng, Zhaopeng, Feng, Wei, Zhang, Kang. *Layered modeling and generation of Pollock's drip style*. Berlin Heidelberg: Springer-Verlag, 2014.

(Endnotes)

1 M. Whitelaw, *Metacreation. Art and Artificial Life*, MIT Press, Cambridge MA, London 2004, s. 229.

2 H. Cohen, *Driving the Creative Machine*, Orcas Center, Crossroads Lecture Series, September 2010, p.16: http://www.aaronshome.com/aaron/publications/orcastalk2s.pdf

3 The use of the terms 'creative' or 'innovative' refers to, firstly, intelligent and artistic robots, but, secondly, it may arouse doubts coming from the stance to defend humanistic values leading to assertion on the overinterpretation of such behaviours. My point is to claim that intelligent robots are creative, but not in the meaning referred to man.

4 Y. Zheng, X. Nie, Z. Meng, W. Feng, K. Zhang *Layered modeling and generation of Pollock's drip style*, Springer-Verlag Berlin Heidelberg 2014.

5 Film where you could watch how Artificial Intelligence examines cubism, and on the basis of its notes it paints next images using this style: *Analyzing Picasso's cubism using Human Level Artificial Intelligence*: https://www.youtube.com/watch?v=GepzHAWrEHU

6 Website dedicated to AARON: http://aaronshome.com/aaron/index.html

7 Films about *e-David's* activities *e-David Robot Painting* (https://vimeo.com/68859229), Website dedicated to *e-David: eDavid the robot painter excels in numerous styles*: https://newatlas.com/edavid-robot-artist-painter/28310/

8 Film about *Paul (5 Robots Named Paul)*: https://www.youtube.com/watch?v=EH0WFkcZNDg

9 G. Hoffman's homepage containing a film with a recording of the joint concert with Shimon: *Human-Robot Jazz Improvisation* (http://guyhoffman.com/category/topvideo/) and S. Ness, S Trail, P. Driessen, A. Schloss, G. Tzanetakis, *Music Information Robotics: Coping Strategies For Musically Challenged Robots*, "12th International Society for Music Information Retrieval Conference", ISMIR 2011, s. 568, http://ismir2011.ismir.net/papers/PS4-16.pdf

10 David Cope's homepage: http://artsites.ucsc.edu/faculty/cope/

11 A. Lim, T. Ogata, H. Okuno, *Towards expressive musical robots: a cross-modal framework for emotional gesture, voice and music*, EURASIP "Journal on Audio, Speech, and Music Processing", Springer Open Journal 2012:3.

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In 2007 he founded the Academia Electronica (www.academia-electronica.net) – non-institutionalized part of Jagiellonian University, acting on the model of university in the electronic environment in Second Life, where are carried out official, academic courses and conference's presentations.