Artificial Intelligence and Autonomous Visual Arts

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Artistic research PhD project based on interactions between visual arts and artificial intelligence. My goals are to understand issues of emergence and autonomy when applied to machine-enhanced and purely machinic creativity, which still lies in the plane of ideas. For that I build a theoretical framework from early cybernetics, passing through systems theory and current development in artificial intelligence, as well as definitions of autonomous systems and emergence. I look into relevant contemporary artworks, specially ones using generative resources. I also propose artworks of my own, which are incorporated into the thesis as commentaries and reports on specific questions and technologies.

The goal of this research is to understand the impact of artificial intelligence technologies on the visual arts, dedicating special attention to projects that use automated, generative approaches. The development of neural network models such as StyleGAN, VQGAN or CLIP, allowed artists to render text or images from text prompts, use pre-trained styles based on other artists or visual features, among many new techniques. As claimed previously (Caldas Vianna 2020), the adoption of machine learning by artists established a new paradigm in generative arts: aesthetics are not limited anymore by symbolic algorithms, since the data models are able to infer characteristics from training sets and replicate them. It also leads us closer to the idea of autonomous art-creating entities, and to re-think once more the role of artists. It is not by any chance that recently several projects have surfaced with claims to be autonomous in some way, accidentally connecting themselves to cybernetic art projects dating back from the fifties.

The field of generative art has been thoroughly studied, and the consequences of the upgrade to deep learning methods didn't go unnoticed by the academic community. Among several books dedicated to the theme, I could mention:

- × AI Art: Machine Visions and Warped Dreams, by Joanna Zylinska

- × Art in the age of machine learning, by Sofian Audry

- × Big data : a new medium?, by Natasha Lushetich

- × The artist in the machine : the world of AI-powered creativity, by Arthur I. Miller

Media scholar Lev Manovich is releasing an open-access book, "Artificial Aesthetics", which seems to derive from a 2018 article named "AI aesthetics". But investigations on generative art didn't start with AI. We can cite Dorin at Al(Dorin et al. 2012), (McCormack et al. 2014; McCorduck 2004), as well as Philip Galanter's works (Galanter 2016).

Other texts touch upon issues that are important to my dissertation, such as the comparison between human and machine intelligence, or artistic skill. (Braga and Logan 2019; Sean Dorrance Kelly 2019).

Melanie Mitchell describes such limits in her Artificial Intelligence (Mitchell 2019), while Douglas Hofstadter proposes a relevant theory in his classic *Gödel, Escher, Bach* (Hofstadter 2000). A different take is the alternative rationalisation of AI by Jenna Ng (Ng 2021). Dieter Mersch also makes a stark critique of the idea of machinic creativity (Mersch 2019).

The pioneers of cybernetic and generative art such as Nake (Smith 2019) are also relevant. The overview of these pioneering works proposed by Shanken (Shanken 2015) is very thorough. The founding books of cybernetics and

systems theory are fundamental to understanding the goals and the difficulties in defining autonomy, therefore this research encompasses the works of Norbert WIener, (Wiener 1948) Ludwig von Bertalanffy, (Bertalanffy 2009) Varela and Maturana, (Maturana and Varela 1980) and the overlap of systems and art from Luhmann (Luhmann 2000) and Halsall (Halsall 2008). Special attention must be dedicated to the concept of autonomy, starting with Kant's concept, the cyberneticists concerns, Maturana and Varela's concept of autopoiesis, to the social science and collaborative design idea of *autonomía*, described by Arturo Escobar (Escobar 2018).

Finally, it must be mentioned that several artists have taken AI not only as a tool but also as a subject, most often under a critical perspective. That is the case of Trevor Paglen, Hito Steyerl and forementioned Joanna Zylinska.

This project is based on the practice of artistic research, even though it doesn't relinquish the usage of a very complete text-based elaboration on the history and issues around the field, as seen on the background survey above. The artworks create a particular type of commentary with more academic freedom, as well as a laboratory where concepts can be put to text. They add a much needed poetic perspective on the questions that come up when applying artificial intelligence on art projects. In any case, I still struggle with the place of artistic research, and hope the symposium can help me with the contradictions in my approach.

I hope I can make a contribution to the field by examining what it means to be autonomous for a machinic artist, and what strategies can be used to deal with the limitations of machine creativity. It is quite clear by now that some of the most important barriers to achieve some sort of artificial general intelligence have a lot to do with the skills needed to produce art - a good grasp at figuring metaphors, the ability to disobey rules, being able to propose analogies and more. Even if models such as GPT-3 are getting impressively good at simulating these skills, we know that they derive from existing human production in the form of massive training datasets. It is not by chance that many "autonomous" generative art projects need to rely heavily on contributions from human participants. This PhD project doesn't have the pretension to solve these issues and create a completely automated artist, but rather understand the limitations of the field and propose projects around the limits of the possible.

Much of my research progress is done by writing articles which detail a part of the thesis subject. As I mentioned, I published one on AI and generative art; I have another on machine disobedience being reviewed, and I'm writing on autonomous machinic art projects. I have also exhibited artworks which are part of the research project at the Uniarts Research Pavillion in Helsinki, in 2021, and I am preparing another exhibition at the Finnish Museum of Photography in 2022. I have organised a one-day seminar on Arts and Artificial Intelligence during the KUVA Research Days seminar in Helsinki in 2021.

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