POSSIBILITIES TO USE AI, ACI AND ROBOTIC TECHNOLOGIES IN FURTHER DEVELOPMENT OF GRAFFITI, STREET ART AND PUBLIC ART

Author Note

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Abstract

In the article I use qualitative research methodology and an ethnographic approach to research how the art we meet in the urban space, like Graffiti and Street Art, could benefit from the use of ChatGPT and other types of Artificial Intelligence in different stages of content creation and also vice versa, or on the contrary, doing so would put at risk the inherent resistance nature of these art forms and diminish the general level of creativity in the urban space in the future. The study delves into the reciprocal ties between these seemingly distinct fields, one marked by the imprint of the highly controlled and sometimes "conformist" artificial intelligence and the other being raw outbursts of energy witnessed in the streets, a clear manifesto of freedom and right to expression of radical views, voiced by Street artists and Graffiti artists.

For my research goals, I have collected visual and textual samples of Graffiti and Street Art, interviewed vanguard digital artist working with the concept of Artificial Creative Intelligence (ACI), Mark Amerika and implemented an array of empiric field studies of AI application in the form of written and visual content creation using AI technologies. The results imply that one of the fundamental questions to be asked is: "Where should creativity go?". The interview also helped to identify further directions for the research process: to consciously train different AIs and apply the results to field experiments in urban settings.

The conclusion is that, if we can understand the creativity concept better, we could avoid the risks and use the benefits of involving AI in the process.

Keywords: AI, Street Art, Social Resistance, Participatory Art, ChatGPT

Introduction

The aim of the article is to find out, whether Street Art and Graffiti could visually and conceptually benefit, if the artists and writers used ChatGPT and other types of AI in different stages of content creation in the urban space or, on the contrary, doing so would put at risk the inherent resistance nature of these art forms and diminish the general level of creativity in the urban space in the future.

Artificial Intelligence (AI) is a versatile tool that allows people to reconsider how we combine information, evaluate data, and apply the ensuing insights to make better decisions. Artificial intelligence algorithms are designed to make conclusions based on data that is often in real time. They differ from passive machines, which can only respond in mechanical or predefined ways. They combine information from many sources using sensors, digital data, or remote inputs, instantaneously analyze the material, and act on the insights gained from that data. AI and data analytics are becoming an increasingly important subject, because due to the

active and large-scale approach to data combining and processing it is revolutionizing numerous industries. This may in turn permanently and fundamentally change all aspects of life, as we know it, including the urban spaces a big part of the population lives in. Significant deployments have already changed decision making, business models, risk mitigation, and system performance in banking, national security, health care, criminal justice, transportation, and smart cities (West & Allen, 2018). However, the scope of the impact of AI and the transformation it might bring to society is not clear yet.

On the other hand, Street Art, Graffiti and other urban interventions show the mood of the people, the social issues that are currently important and even the collective subconscious, apart from also serving as a platform for individual creative expression. We can also consider the content from a paremic stance, namely, examine the graffiti messages as part of modern folklore – proverbs, sayings, deep thoughts. The content range of paremic graffiti texts is extremely diverse - everything in society can inspire graffiti-writers, who express their political convictions, ideological and religious viewpoints, protest against the ruling power, growing costs of living and focus on various obscene taboo-themes, sex, alcohol and drugs, school, lifestyles-subcultures, and spheres of private life (Voolaid, 2013).

Currently, when exhibitions, theses, articles and interviews are conducted by AI, there is no point of believing that Street Art and Graffiti, also an increasingly topical discipline, might remain unaffected by the process. The question is – how human beings can impact the course of development and lead it to healthy outcomes, beneficial to society instead of playing simple power games and commercializing every step of the process. Therefore, we have to realize that learning more about AI is crucial before using it for anything important or irreversible. Thus, this article focusses on both understanding the present “state of art” in the field and looking closer at the risks and possibilities for the future application.

Literature Review

The current research in the field of the possibilities to use Artificial Intelligence (AI), augmented reality (AR) and robots in Graffiti and Street Art is quite sparse, due to their mutually excluding properties (mechanical systems vs. creativity). Yet, by an in-depth analysis of the fields we may also detect certain similarities and overlaps. As early as 1946, William Turing talked about a test, to determine whether a machine is capable to respond/pass as a human and be perceived as such (Copeland, 2000). Yet, what was once just a hypothetical question, is becoming an important issue of late, with the current surge of ChatGPT, AI-based technologies and similar. Although the available literature elucidating the matter and/or pointing to the possible future developments is fragmentary, covering just some of the key aspects to think about, and may be charactarized as being eclectic and nonhomogeneous by its very nature (at best), the

author(myself) has attempted to consolidate the fragments of conceptual, visual and cognitive data, establishing/marking, what may be characterized as a route/path traversing the field of interest and meticulously following it. This has been possible by blending together theoretical knowledge provided by some of the authors (Bonadio et al., 2022; Mendelowitz, 2020), a practical approach of building useful, functional robots capable of making art (Berio et al. 2016; Kuznetsov et al. 2010), and AI based art-making technologies (Li et al., 2020), a look back into the history of intellectual machine development (Copeland, 2000), other attempts to combine theory with practice (Constable et al. 2023), and artificial intelligence with creation (Amerika et al., 2020). Another, parallel route to an in-depth knowledge of the subject discussed, is formed by conversations with ChatGPT and its variations, entering questions/prompts in the available software and an analysis of the answers received, as well as an ongoing field study of the graffiti texts/images in the streets.

In other words, and for taxonomy purposes, the textual references used in this article may be divided in the following categories: theoretical studies of AI, descriptions of AI-based instruments, mechanisms and robotic technologies, theoretical texts on Street Art as a means of Resistance, actual samples of text in the streets, obtained through the medium of photography and text generated by ChatGPT 3.5.

Geographically the literature and other research products cover a wide range of cultural territories, from Australia via Asia and Europe to North America, providing a truly global insight in the field and subject matter.

In the following paragraphs I will provide a summary of the most important ideas/frameworks discussed in the literature, with the objective to also mark the boundaries of the present “state of art” both in the field and in general and the research process in particular.

Constable insists in the interview that AI makes a fantastic subject for Street Art, due to its contraversality. At the same time, humans must lead AI (and not vice versa), and as we learn more about it, we will be better able to ask the proper questions to prevent unforeseen and potentially disastrous repercussions of biased and unethical AI (Constable et al., 2023).

Mendelowitz discusses an analytical framework for classifying AI-based public art. These pieces can be categorized as generative, reactive, interactive, educational, or static works. This study uses taxonomy to suggest new fields of creative investigation and provides examples of public artworks that fall into each of the five categories to exemplify it (Mendelowitz, 2020).
In a comprehensive article Bonadio et al. assess the ways in which artists themselves can use AI and AR technologies to improve or alter their works, look at how AR and AI are developing and provide examples of how these technologies are currently being used in street and graffiti art, discuss general copyright and moral rights issues that arise from the interaction between these forms of art and AR and AI, and focus on whether works derived from street art and graffiti are protected under copyright (Bonadio et al., 2022).

In a more pin-pointed and practice-based approach Berio et al. describe how utilizing the

kinematic redundancy and torque control capabilities of a compliant Baxter robot, quick and smooth drawing movements may be achieved. They focus on creating letter formations with a marker in the style of graffiti. The end product is a system that captures the aesthetic and dynamic characteristics of the style under examination and allows for its reproduction with a compliant controller that is secure for people using the space around the robot (Berio et al., 2016).

In another, earlier hands-on approach Kuznetsov et al. describe how putting WallBots in the hands of political activists and public artists, a design space for magnetic kinetic systems as a means of performance and public expression may be revealed. The authors hope their work may serve as an inspiration for future initiatives that combine academic research with grassroots public art and activism (Kuznetsov et al., 2010).

For the past 30 years Mark Amerika has been active in the digital world, combining poetry, performance, and research in his artistic practice. The idea of Artistic Creative Intelligence (ACI), which he has been developing together with doctoral students at his research Lab recently, is an animated digital fiction that is initially being developed as a dataset of performance captures. Over time, this dataset will train itself to develop a distinctive style of creative expression while simultaneously raising questions about what it means to be an artist who continuously explores its own trajectory as an intelligent entity auto-remixing datum from the "Source Material Everywhere" into fleeting bursts of poetic illumination (Amerika et al., 2021).

Importantly, the theme of Artificial Creative Intelligence is central to my research topic in general, as creativity is the separating force between the machines that predominantly have just the replicating capacity and the humans, who have the ability to actually create. How far the AI can be trained to become “more human” and how far the human potential may be expanded by the use of AI and machine technology? Literature demonstrates various paths that may be pursued to achieve a desirable result. For example, in the creative development of the Baxter robots the authors' goal is to create computational models that will make it possible to transfer intricate and unique artistic abilities to robotic platforms (Berio et al., 2016) and Amerika’s team have created a true “merger”, both personalizing/individualized the AI and depersonalizing an individual (Amerika, 2021).

To pass Turing’s test (Copeland, 2000) described earlier, the AI will have to acquire creative skills, but what will happen next, if it actually does? A more serious study of the utopian and dystopian consequences is quite urgent before it would be safe to proceed further in the development of AI. The literature available does not fill in the gap of the knowledge of how the world might change, when AI becomes truly creative, because the articles mostly have other, more down-to-earth objectives in mind.

Street art, according to Kuznetsov et al. contributes to the urban aesthetic, whether we like it, detest it, or ignore it. It affects how we feel and interact with the surroundings (Kuznetsov et al. 2010), and in this it is quite similar to AI.

Intelligent environments, ubiquitous computing technologies coupled with artificial intelligence

(AI), are currently being adopted by artists to create interactive public art (Berio et al., 2016). Technologies are rapidly evolving and more advanced methods quickly replace the previous findings.

What might happen when Street Art fully merges with AI, are people ready for a drastic change in their immediate surroundings and how will it affect their privacy and individual expression, and could Street Art and Graffiti lose its principal qualities of Resistance and Rebellion because of this? Will the expansion of tools finally destroy the artist as an individual author?

The answers are not there yet, but a closer analysis of the results already described in the reports available might be able to shed some light and destroy the doubts, therefore the topic is highly relevant for further research.

Methods

For the purposes of the article, I applied qualitative research methodology, which is used to understand people's beliefs, experiences, attitudes, and interactions. Qualitative research involves collecting and analyzing non-numerical data (e.g., text, video, or audio) to understand concepts, opinions, or experiences. It can be used to gather in-depth insights into a problem or generate new ideas for research (Bhandari, 2023).

I chose qualitative approach over quantitative research, because it was clear that the answers I am looking for are not measurable, nor tangible, rather experiential, even ephemeral at times. My goal was to get more insight into what, why and how could hypothetically be or already is happening in the field of activities where AI and Graffiti overlap, rather than to measure their quantitative parameters.

I applied a combination of several specific qualitative research approaches. One of them was ethnographic approach, immersing in the target participants' environment to understand the goals, cultures, challenges, motivations, and themes that emerge. Ethnography has its roots in cultural anthropology where researchers immerse themselves within a culture, experiencing the environment firsthand, and sometimes as a "participant observer." (Tenny et al., 2023). In this case "the environment" was both the Porto city streets with walls covered with graffiti, stencils, stickers and posters and the artificial intelligence environment with various AI Apps (AI Art Generator, DALL E 2, Deep Dream, AI Smith, Ask AI, Assistant AI, AIChatPowerBrain), groups on social media (FB, IG) etc.

In parallel, an important part of my research process using ethnographic approach was visual analysis, a qualitative research method which included collecting a set of Graffiti and Street Art data samples in the streets of Porto using photography and audio/video recording, looking at the characteristic features (style, elements, colors, words that repeat) and extracting textual content into separate samples using both analogue and digital methods.

I also empirically tested the concepts I read about, creating new AI based artworks and

texts, showing the work, seeing how people respond to it in an Open Studio environment and talking to other artists about the ideas) and phenomenological research, investigating how the phenomena of AI and Graffiti are perceived (Bhandari, 2023).

I also carried out a face-to-face interview with a vanguard digital artist working with the concept of Artificial Creative Intelligence (ACI), Mark Amerika.

For the interview purposes I put together several sets of questions that could be asked to find out more about the possible impact of AI on the creative process. I used several methods to arrive to the right questions, including a prompt asking an AI to generate "a set of questions Mark Amerika has not yet answered to"**.** I also prepared a list of my own questions. Among these the most important being **–** How can AI help to improve the public space and the way people interact with it creatively (Street Art, Graffiti, other forms of public expression.)? Is there a way to use AI to enhance these art forms? What software you use to customize the AI? How do you see the role of AI evolving in the creative process? Despite having preliminary questions, eventually I chose to do a semi-structured/loose interview.

Outcomes and Results

There were several types of outcomes and results I obtained during the study. The results from the conversation with Mark Amerika and visual outcomes - images generated by the software from my practical experiments.

Part 1. The Interview

The actual interview was a face-to-face conversation and took place on May 1, 2023 in Porto.It included just some of the questions planned and the natural flow of the interview led to other questions, I had not previously thought about and later the conversation evolved into a group discussion involving a number of other participants.

According to the interview (Amerika, 2023), it became clear that there are various ways to use AI for creative purposes, and, metaphorically speaking, travel in time by doing so, for example some of the first Amerika's experiments with image generator DALL-E had involved a combination of ancient vases with the work of a contemporary artist coming from the Graffiti scene. It is important to understand that Prompt Art is also a skill, and there are ways to train the skill to become an excellent prompt artist. However, if people use just a basic approach to it, the results they obtain might be a rip-off of other people's work instead of something new.

AI can be trained to become the voice of the artist operating it, thus, according to Mark Amerika becoming ACI – Artificial Creative Intelligence.

For an artist, novelty and creativity are highly desirable outcomes therefore one of the criteria to understand if the AI technology is being used efficiently is precisely how innovative and creative is the outcome. Wittgenstein once made a famous statement, saying that "the limits of language mean the limits of my world" (Wittgenstein, 1922, p.76). Rephrasing it, the scope

and the nature of the world we can create with the help of AI, using access to a repository of immense knowledge (AI) in the process, highly depends on the way we use the language tools in the prompts entered.

One of the important aspects that also surfaced in the later part of the conversation is "the zone" principle. To enter the flow state of mind and one-pointed attention in which truly great things happen and the highest goals are achieved, automated actions may be extremely helpful. Being in the zone is a condition of intense focus in which accomplishment of the work at hand appears to happen unforcedly, effortlessly, and gracefully. When an individual is challenged, this occurs and the flow state is attained, even if their skill set is barely adequate for the task at hand. When athletes achieve the flow state, they lose self-consciousness, which is why they have difficulty explaining how they felt while in the flow state, but their retrospective reports claim that they felt fantastic afterwards. Individuals in the zone are less likely to hesitate or second-guess themselves, allowing them to perform at their best (Csikszentmihaly et al., 2005.). Creating AI-assisted lists and using algorithms may add structure to the art-making process and also resolve many mundane aspects that, at times, stop creativity and flow from happening. On the other hand, they also may not. As the nature of the creative process tends to be quite subjective, experiments with AI also do not grant added value to the work but they can be an option and for some – a way to achieve larger goals.

Part 2. Practical experiments

The following images were obtained using the AI based image generators Deep Dream and DALL E 2 with prompts.

For my first piece I entered a simple prompt with the words *"Graffiti, Resistance, Blue, Woman"* and later processed the image until it felt satisfactory. My objective was also to test the generator's response to graffiti and visually compare the outcome with the images I have directly taken in the streets.

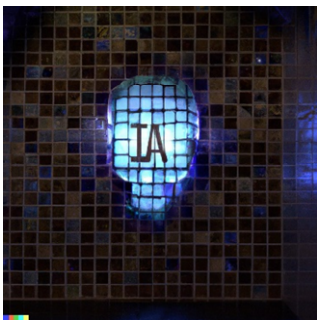
Figure 1

Note. Image generated by OpenAI, Deep Dream

Later on, I combined my findings doing field research in the streets of Porto, theoretical readings about Graffiti and Street Art, with the notion of Artificial Intelligence, imagining AI as one of the artists working out there in the streets, in abandoned buildings, painting graffiti on trains etc., and the possible works it could create in the role of a street artist. My goal was to produce a coherent body of work. I used the following prompt*: "A mosaic, consisting from blue 3D tiles showing a blue rounded robot climbing a steep blue concrete wall with a coat and the name "AI" written on the back"*. And several variations of this prompt, for example*, "A mosaic, consisting from blue azulejos 3D tiles showing a blue rounded pensative robot entering a tunnel illuminated in warm light violet arch portal in a tile dark wall with a coat and the name "AI" written on the back"*.

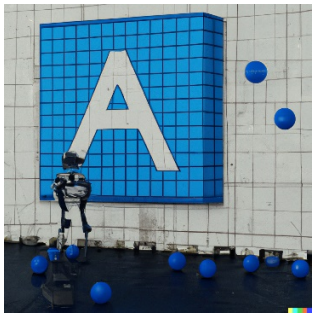
The results are the following –

Figure 2



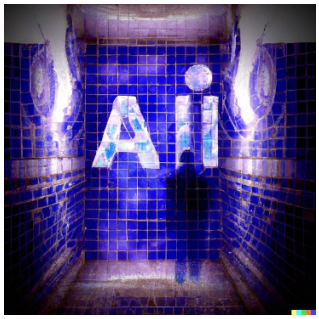
Note. Image generated by Open AI, DALL-E 2

Figure 3



Note. Image generated by Open AI, DALL-E 2

Figure 4



Note. Image generated by Open AI, DALL-E 2

I proceeded to further develop the images with words I had collected in the streets (for example, in Fig.5 “OK”), attempting to get images that would emulate a blend between my personal visual style and the impressions collected, synthesizing the subjective and objective impulses that serve for making art, but, largely giving up my persona, striving to be an excellent prompt-engineer and delegating the creative process to the AI-based generator.

The outcomes have some of the qualities I was trying to achieve, but the technology has to be trained further to be able to get more specific and controlled results. I also discovered that the image generator had certain limitations, when it came to clearly spelling specific words, if prompted to do so and at times would manipulate the content.

Figure 5

Note. Image generated by Open AI, DALL-E 2

Figure 6

Note. Image generated by Open AI, DALL-E 2

Discussion

Observations, experiments and also the scope of activities visible on social media (seminars, workshops etc.) show that AI is developing quite fast and what used to be a vanguard activity a few years ago, now is already a habitual practice, done by many. AI in a way is also being commodified.

It is not only important to ask the question "Where does creativity come from?" Amerika discusses so often (Amerika, 2021), but also to inquire and research "Where is creativity going to?", to what goals are the creative energies channeled, because how we answer to this question will determine the choices we as individuals make in the creative process and other fields, heading into future. Some of the AI and robot technology literature I read, for example, Berio et al., delve deep into the technical aspects and methods of their work, but leave other fundamental issues out of scope. However, my practical prompt engineering tests and also dialogues with ChatGPT showed how important it is to know what you really want, and then meticulously describe it, yet at the same time leaving some "blank spaces" for spontaneous occurrences. Yet, to know what to "prompt"/order, you have to understand, why it is needed, and, how that may make the world a better place.

The research findings also demonstrate that Street Art and Graffiti can be used as a platform to test possibilities to develop AI and vice versa. The process can be mutually beneficial, if applied with reasonable care. On the other hand, the lack of general awareness of a big part of society and many individuals separately puts the process at risk. Here we have to bring in the example of the nuclear energy – it is an extremely powerful force, but if applied with malefic intentions it may lead to devastating results (like in the case of the fairly casual experiments several countries are conducting with this energy and nuclear bombs). In AI helps to form an impression of the "big picture", but society has to be ready to see it.

Although AI so far is under-investigated, it may be beneficial to look at many previous scientific discoveries through a post-AI lens and see, what can be implied. Also, many literary works that were written with a view of a distant future of an advanced technocratic society now may be reviewed and bring new insights.

Conclusion

The results/findings of the interview lead to think that personal willpower and a clear vision is really an important part of the communication process with AI, because only then people can achieve something important. It is important to strive for the unexpected instead of treading the beaten path. AI may prove extremely useful in ways that we do not imagine yet, if used consciously.

The interview helped to see further directions for the research process: practical training of different AI tools, solving the problems and obstacles arising in the process and applying the results to field experiments in urban settings. It could also be beneficial to look at the rise of AI-based art from a post-humanism theory perspective (Wolfe, 2018), challenging the idea that the humans are and will always remain the central driving force for creativity on the planet.

The conclusion is that, if we understand creativity better, we could avoid the risks and use the benefits of involving AI in the process. From the results obtained I also conclude that one of the fundamental questions is: how to make the AI do what you want it to do, think the way you think and feel the way you feel, instead of doing the things it makes you do, feeling the emotions it makes you feel or thinking what it makes you think. Creativity and intelligence is a feature and quality that used to separate a robot from a person, as we can see from the Turing test (Copeland, 2020). Yet, today people tend to automatize their own actions, and robots receive more and more creative freedom, even if they cannot be 100% creative, as yet. In the future a further merger between the two (using extended selves and bio-robots for many purposes) is bound to happen, if there is no detour from the way things evolve at present. And this brings both utopian and dystopian scenarios to mind. However, we should not give up on our own creativity, because it is a fundamental human right, and train the machines in a way that we do not become over-dependent on their algorithms. That is why it is important to

discover more about the creative process both on a personal and social level and the raw outbursts of images and texts we meet in the streets thanks to the artists from the Graffiti and Street Art scene may serve as a good reminder of what a spontaneous and creative approach means in real life. So far.

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Photographic images

Figure 1. Image generated by OpenAI, Deep Dream. Prompted and processed by Prikule, L. 2023.

Figure 2-6. Image generated by OpenAI, DALL-E 2. Prompted and processed by Prikule, L 2023.