Polics and Generative Adversarial Network tools The Aesthetics of Renewable Energy Sources Landscapes

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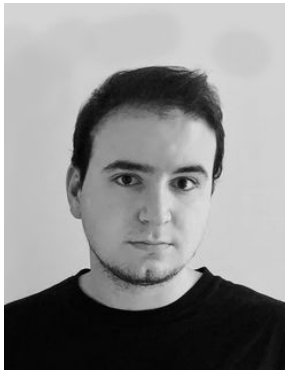

Abstract

Landscape contains specific elements that, by their very nature, resist complete perception or direct experience. How can we grasp the essence of nature, environment and space? These are things that we're constantly being trained to look for. In other words, social presence is a necessary requirement for the concept of designed landscape to exist, since it is the result of the active participation of people in its configuration and production. In that sense, the spatial qualities, the meanings and experience that landscape design entails, constitute a broad and extensive field of research. Contemporary, construction of renewable energy sources infrastructure has been of great importance. However, the impact of these infrastructures on landscape itself is often ignored. Therefore, the need for a more holistic approach that takes into account these specific changes and new conditions is imperative. In this sense, the proposed poster refers to an alternative approach through the concept of digital variation and the ways it can be applied to architectural and landscape design, focusing on renewable energy sources infrastructures. In particular, it has as its starting point the concept of aesthetics, and through it the politics that is directly applied to a wide spectrum of social actions. This is attributed to the forms of aesthetic distribution which throughout the ages follow specific principles and contexts. To that extend, contemporary use of digital tools broadens the social influence spectrum of landscape aesthetics. Therefore, they present a new meaning of political influence to a two-dimensional or three-dimensional surface as more interactive means of story-telling of a potential scenario, which should, or could, take place. In particular, by deploying artificial intelligence (AI) tools, especially Generative Adversarial Network (GAN) software such as Midjourney or Dall-e, it is possible to identify patterns and shape policies

directly related to an under-configuration landscape. Mainly, in a possible aforementioned landscape situation, we could achieve more sustainable energy development that takes into account a plethora of landscape changes, suggesting, as a result, the most preferable one and ensure an environmentally friendly future. In conclusion, additionally to conventional methods, the perspective of use of G.A.N. A.I. tools by experts involved in landscape design will be used, in order to discuss the concept of digital variation through which it is argued as a preferable way to achieve effective policies for the landscape both in terms of use of various renewable energy infrastructures, and also in general.

1. Introduction

Landscape contains specific elements that, by their very nature, resist complete perception or direct experience. How can we grasp the essence of nature, environment and space? These are things that we're constantly being trained to look for. Simultaneously, we could argue that any attempt to define the concept of landscape, lasted several years; in a sense that is still difficult to be satisfied with a single and only definition that supports a specific interpretation of 'landscape', which is closer to reality. Tim Ingold, in its book titled: 'The perception of the Environment', two decades ago, was already commenting on how we perceive our environment, in an attempt to study human-beings and their perception to their surroundings. To further understand this correlation, he notes about the concept of landscape: 'The landscape is not 'space'. In the landscape, the distance between two places is experienced as a bodily movement from one place to the other, and the gradually changing vistas along the route. It is as though, I could direct the movements of my body within it, like a counter on a board, so that to say 'I am here' is not to point from somewhere to my surroundings, but to point from nowhere to the position on the board where my body happens to be. And whereas actual journeys are made through a landscape, the board on which all potential journeys may be plotted is equivalent to space' and 'The landscape is not 'nature'. Of course, nature can mean many things. The world of nature, it is often said, is what lies 'out there'. All kinds of entities are supposed to exist out there, but not you and me. We live 'in here', in the intersubjective space marked out by our mental representations. Application of this logic forces an insistent dualism, between object and subject, the material and the ideal, operational, and cognised, 'etic' and 'emic' [3].

In other words, Tim Ingold recognizes and evaluates 'landscape,' as most spatial formations, that it can be understood as a complex structure. Hence, it is clearly distinguished from other similar but more unambiguous concepts such as nature, environment, or space. It is approached as a multitude of social, ecological, and cultural interdependencies that accommodate the fundamental relationships between people and their environment. Human presence is an inescapable condition since the landscape acquires existence only and/or because of human beings, not only as passive spectators but mainly as active participants in its configuration

and production. Especially, for landscape architecture, it cannot be treated as a phenomenon of unequivocal analysis because landscape is ‘shaped’ because of different and various spatial and cultural interpretations. Or in other words, though landscape planning and design meanings and ideas of a culture could be spatially expressed. Thus, the design pro-cess can be seen as the production tool of the appropriated places which are inextricably linked to the quality of environment experience and well-being.

Furthermore, activities that are being happening ‘in landscape’ are endless. Perhaps because the human individuals being the participants ‘in it’, make up this complex structure where landscape is never completed: neither built, nor plain, nor urban, nor natural, etc. It is constantly under configuration. That might be the reason the conventional dichotomy between natural and built (or man-made) parameters of landscape is, to a point, so problematic. And so, these ever dynamic and changing relationships dictate the catalytic value of temporality for the perception, planning and production of landscape [8].

2. Landscapes of Renewable Energy Sources

Nowadays, the contemporary emphasis on building infrastructure for renewable energy sources (RES) is of utmost significance. To elaborate further, the adoption of RES technologies, with a particular focus on wind and photovoltaic systems, plays a critical role in the European strategy to combat climate change. The EU's 2030 climate and energy framework outlines three primary goals for 2030: achieving a minimum 40% reduction in greenhouse gas emissions compared to 1990 levels, ensuring a minimum 32% contribution from renewable energy, and aiming for a minimum 32.5% enhancement in energy efficiency [13].

While the transition to RES not only reduces greenhouse gas emissions but also creates new cultural landscapes, the impact of these infrastructures on landscapes ‘themselves’ is often ignored. Over the past two decades, the rapid growth of renewable energy (RE) has led to substantial demands for land use, resulting in significant alterations to the visual appearance of landscapes. Because the design of RE equipment is typically predetermined by industrial standards and cannot easily conform to architectural traditions and local landscape characteristics, RE projects have faced substantial criticism for their industrialization of natural landscapes. This critique is most pronounced in the case of wind turbines but also extends to photovoltaic solar panels and, to a lesser extent, hydroelectric projects. Furthermore, according to the European Landscape Convention, which defines landscape as ‘part of the land as perceived by local residents or visitors, evolving over time due to natural forces and human activities,’ the industrialization of landscapes through infrastructure can lead to negative perceptions, stemming from undesirable cultural, environmental, and aesthetic changes to the landscapes. In the context of renewable energy, the impact on landscapes has emerged as a significant source of opposition to new projects. For instance, in Europe, the conflict between RE development and landscape preservation manifests in two ways: first, public resistance to RE

projects based on landscape protection concerns, and second, the uncontrolled expansion of RE projects is anticipated to result in substantial alterations to European landscapes. Or in other words, Europe is known for its high density of scenic landscapes that often have strong ties to architectural and cultural landmarks and historical settlements. Preserving this heritage is a top priority, not only for its conservation and its connection to the cultural identity, sense of place, and quality of life of European citizens but also because of its direct connection to tourism and, consequently, economic development. This has significantly hindered the desired integration of renewable energy into the overall energy mix [4].

Based on these findings, it can be concluded that the impact of renewable energy infrastructure on the landscape varies, depending on the type of energy source and specific landscape characteristics. Strategies such as vegetation screening and careful design can help minimize the visual impact. However, further research and a holistic approach are needed to develop optimal strategies for mitigating landscape impacts. For example, in Greece renewable energy sources and landscape aesthetics have gained attention in recent years. The implementation of successful, local-scale innovation projects and initiatives in Greek islands like Kythnos, Ikaria, Sifnos, Tilos, Agios Efstratios, Crete, and Chalki have contributed to positive social change and sustainable development [5].

3. Concept of Digital Variation

Therefore, the need for a more comprehensive approach that considers these specific changes and new conditions is imperative. That argument could imply shifting our thinking towards the concept of variations [6-14]. In literature, it can be argued that architecture occupies a unique yet dynamic position among three major disciplines: science, art and philosophy. Or, in other words, architecture is an act that deals with variability more than all other disciplines [2]. Similarly, as architecture does, landscape architecture is the field of study and design of landscape and therefore it certifies the history and any perspectives of variability that depend on socio-economic, environmental and cultural conditions. It is especially important to understand any dynamic landscape tension to variation, the dynamics of those specific changes and the resulting ‘genius loci’ that will be displayed, highlighted, prevented or transformed. Architecture and in our case, landscape architecture, are now approaching variations through a somewhat more philosophical perspective. To that extend, any designed result (variation) could be presented as a theorical tool for architecture and landscape architecture to manage encountered diversity. They (variations) would be the means that architects use to control the turbulent variability which, in any case, they cope with. That could be depicted, to an applied level, in the use of most contemporary digital architectural design tools which include various technologies (e.g., artificial intelligence, machine learning, virtual and augmented reality) [7-9].

Variation is obviously neither a new concept nor a new technique in relation to creative processes. In music, for example, it has existed as a production technique since, at least, the 17th century. It refers to the process where an original musical theme is serially mutated through a process where some parameters remain constant while others are modified. These parameters can concern a series of elements, such as melody, rhythm, harmony, color, orchestration, etc. In other words, we are already talking about a multiparametric, dynamic process that creates a particularly extensive range of possibilities. Despite all changes and transformations, however, through variations a common basis remains. We could say that this is a more general idea defined and described by the variations: '*[…] music with a central theme, accompanied by and based on a harmony, produces its material through a, as I call it, developing variation. This means that the variation of the elements of a basic unit produces all the thematic forms which provide fluency, contrasts, variety, logic and unity on the one hand, and character, mood, expression and all necessary differentiation on the other – thus working out the idea of the piece'* [12].

So, we can imagine a similar process in the context of design – and it is likely that we can easily find similar examples from the history of architecture, even when the term 'variation' does not appear. However, digital media brings about a notable change in what Schoenberg describes: the possibility of exhausting possibilities. That is, the possibility of creating an exhaustive process where the products are so many that they, now, exceed the goals that planning can have as a process of producing specific answers and begins to approach a research process. The result of this condition, where the boundaries between design and research begin to disappear, is that the 'idea of the track' to which Schoenberg refers in the above passage also loses its importance. There is no longer a predetermined idea behind the process of variation to give it meaning, but instead meaning is constantly emerging – and therefore changeable – through the difference of variations and their exhaustive nature [8].

The result of this process is not a set of generated architectural elements based on selected parameterizable constant variables but, in fact, a set of theoretical but at the same time, operational tools for architecture and design. On the one hand, for the management of the resulting multiplicity and, on the other, for the understanding and perception of the landscape as a political space, in a novel approach to the aesthetics of the landscape, not in its traditional sense, but as practices of sharing the sensible [10-11].

4. Landscape Aesthetics as an idea for Landscape Politics

It could be said that its starting point is the concept of aesthetics, and through it the politics that is directly applied to a wide spectrum of social actions. This is attributed to the forms of aesthetic distribution which throughout the ages follow specific principles and contexts. To that extend, contemporary use of digital tools broadens the social influence spectrum of land-scape aesthetics. Therefore, they present a new meaning of political influence to a two-dimensional

or three-dimensional surface as more interactive means of storytelling of a potential scenario, which should, or could, take place.

To be more specific, aesthetics is about experiencing the world; it includes sensing but also sense-making, transforming the ability to sense into knowledge and/or meaning [1]. To describe the concept of aesthetics, Rancière introduces a definition about 'partition of sensible' to relate 'aesthetics of politics' to 'politics of aesthetics'. In particular, he notes that 'partition of sensible' is: 'The system of apparent facts of sensory perception which reveals at the same time both the existence of something common and the divisions which define, within this system, the respective parts and positions. Therefore, it determines both a shared common element and exclusive shares. This division of parts and places is based on a distribution of spaces, times and forms of activity which determines the very way in which this something in common offers itself for participation as well as the way in which each has a stake in this distribution.'

In this way, aesthetics focuses on the distribution of the visible and the invisible, time and space. Politics, in turn, focuses on people who should speak visible and the characteristics of space and time. Thus, in the Rancierian approach, politics have an aesthetic dimension, which does not succumb to the aestheticism of beauty, but are related to perception and sensible. The two concepts are not considered in parallel or defined together but are two forms of sharing. The dual meaning of that definition allows the concept of aesthetics to be subsumed into that of politics, as the latter includes collective practices and experiences that consist of concerns about human-beings perception (e.g., about environmental and landscape contemporary issues) and social participation. In other words, they could at ease considered as purely political concepts. At the same time, they are related, by their nature, to the perceptible and in this way define aesthetics. Simultaneously, politics, in the sense of aesthetics, have their own ones because they determine what can be said and seen [10].

Therefore, in this dual relationship the most critical point is the distinction of the various forms of social visibility and organization, and by extension their common points. That could be read as more than a Platonic approach of democracy, as a contemporary, efficient, sustainable and political right approach for modern societies to take landscape design and configuration decisions under the condition that all those who are formally equal in a society hierarchy, but often cannot participate, have an ability to politically participate in the public realm so as to been heard or could be heard. Thus, partition of sensible is not only a concept that serves to describe the social reality of the partitions that are realized, but, moreover, it is a key concept through that architectural and landscape design suggest a spectrum of political possibilities to emerge sociopolitical practices or to create unequal conditions. That approach is closer to a Kantian conception of aesthetics where a priori forms of the perceptible, such as space and time, determine the way that various situations occur. Space and time, how-ever, are political issues, since their division is

what determines the political participation of human beings. Thus, aesthetics is political, and politics is aesthetics, because they are both practices that challenge any historical, environmental or cultural factor that delimit social act and participation [10]. In terms of landscape perception, aesthetics is based on the introduction of the concept of 'partition of the sensible' that pushes us to rethink our way of environ-mental perception and by extension of landscape design and configuration. The aesthetic practices which create new paradigms and might set new standards can only happen in a form of dichotomy. That dichotomy constitutes the constructive conflict between perception and understanding of the sensible. It adds the element of disagreement by highlighting that an (landscape) issue is not always clear, but instead constitutes a conflictual relationship involving space and time within any apparent consensus. Furthermore, as it will be argued below, it is important to mention that the aforementioned practices, more than ever before, are easily provided by digital design tools and the digital variations produced because of their social use.

5. Conclusion - GAN software and Landscape Perception

More than at any other time, the need to transcribe the various technological developments, to a similar extent as it already happens in social life, in the landscape planning and design processes can be noticed in the period of the SARS-CoV-2 pandemic, 2019-2021. In other words, various technological and digital means were supposed to consist of the only, perhaps, common toolbox for the continuation of social activities. At this point of view, landscape architecture was forced to find a new place in the new equilibrium that had been created. Thus, at that time began the first substantial discussion about the ways that would allow humanity to cope with the contemporary challenges of the landscape. Back in 1950, Turing introduces the concept of artificial intelligence in an attempt to describe future computing systems that will be able to have levels of intelligence corresponding to the human brain. Since that first definition, different definitions have been used to describe this concept. Rich and Knight, for instance, in 1990, define Artificial Intelligence as the result of the study that would allow us to create computers with the ability to complete processes, that human working on them was more efficient until then. In 2010, two decades later, Poole and Mackworth expand the aforementioned definition by adding that 'artificial intelligence is the field of study of the synthesis and analysis of computational systems that act intelligently'. Thus, leading, subsequently, to more descriptive and precise interpretations and approaches for that specific concept that place it as the engineering science that designs 'smart/intelligent' devices and complex computing programs which combine machine learning and information analysis. In this sense, we could argue that artificial intelligence is a field of computer science with wide and ever-growing applications that uses computational methods to simulate human intelligence. Also, in this definition, it is worth focusing on two key concepts which acquire particular importance: firstly, the concept of ‘intelligence’ and, secondly, that of the computer, not so much in the traditional

sense but more broadly in its interpretation as a ‘machine’ [9].

The concept of ‘intelligence’ refers to the set of cognitive abilities of an organism that allow it to perceive, evaluate and adapt to its environment by forming numerous relationships with it. It is inextricably linked to humans, thus constituting a basic criterion of differentiation from the rest of living organisms. However, throughout the ages there is a philosophical debate that explores both the 'exclusivity' of intelligence from humans and the possibility of transferring it to a machine, in such a way that it, finally, acts like a human brain. That could be described by a mathematic approach of the 20th century that states that any accounting approach, which can be translated into mathematical formulas, can be mechanized. In other words, if the accounting approximation could be a mathematical formula, it could just as well be performed by a machine. The first historical example that subsequently formed the background of modern computer creation is the Turing machine, made in World War II, as an attempt by the British to decipher the German Enigma machine. At the same time, ‘machines’ are considered all tools or means that, firstly, participate in the production of work - transmitting energy or converting it into a different form-, secondly, facilitate human work and, thirdly their usage has as a result the increase in human’s work performance and efficiency. To that extend, the inception of artificial intelligence is based on a similar idea: Artificial intelligence, the scientific field that produce machines which are capable of performing in human-like ways, is not based on the idea that a computer can function as a human brain. Instead, it stems from the fundamental assumption that the human brain functions as a computer, and thus creates the belief that computers can become complex enough to function as humans [2]. Nowadays, their mechanical structure has the flexibility to combine in numerous and separate ways. That way, results that are distinguished by their short-lived and variable character can be provided. Mainly, because every such computing system has the 'need' to evolve and change constantly trying to survive in its ever-changing environment [9].

Focusing specifically on GAN software, AI applications and tools are categorized into three levels according to their capabilities. Mainly to perform a wide range of processes, and secondly, to be able to evolve or not, finally, in a potential but virtual environment. The first level includes the palette where all modern means and tools of applied artificial intelligence. These constitute weak or limited artificial intelligence and are software with intelligence in a specialized and narrowly defined domain. Their performance, however, can be quite high-level but is limited exclusively to him. GAN software could be included in this category. In conclusion, in the possible aforementioned landscape situation, we could achieve more sustainable energy development that takes into account a plethora of landscape changes, in particular in term of landscape aesthetics, suggesting, as a result, the most preferable one and ensure an environmentally friendly future. In conclusion, additionally to conventional methods, the perspective of use of G.A.N. A.I. tools by experts

involved in landscape design will be used, in order to discuss the concept of digital variation through which it is argued as a preferable way to achieve effective policies for the landscape both in terms of use of various renewable energy infrastructures, and also in general.

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