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FROM THE GROUND TO THE SKY:
NEW CHALLENGES FOR TERRITORY AND LANDSCAPE PHOTOGRAPHY ACROSS CULTURES IN THE DRONE ERA

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Declaration of Authorship

I declare that I am the author of this work, which is original and unpublished. The authors and works consulted are properly cited in the text and are included in the reference list.

Davi Magalhães de Souza

(signature)

DEDICATION AND ACKNOWLEDGEMENTS

In the early autumn of 2019, a young Brazilian arrived in Portugal, eager to immerse himself in the world of landscape architecture. These initial steps were filled with the excitement of discovery, but over time, Portugal, with its warmth and culture, became a second home. Now, as I approach the conclusion of this integrated master's journey, I find myself reflecting on five years of growth, learning, and unforgettable experiences.

This thesis was completed under the invaluable guidance of Professor Dr. Nuno Loureiro, not only a mentor but also a friend. The topic, grand and deeply relevant in its interdisciplinary scope, was proposed by him, demonstrating his keen insight into its vast potential and importance. His unwavering support, availability, assertive advice, and constant encouragement have significantly enhanced the depth and clarity of this research. The profound usefulness of this theme across various fields is a testament to his vision. For every conversation that pushed me further, and every moment of inspiration, I owe him my deepest gratitude. I also extend my heartfelt thanks to the Faculdade de Ciências e Tecnologia at the Universidade do Algarve. The faculty, staff, and colleagues who accompanied me on this journey have each played an integral role in shaping who I have become today as a designer and researcher.

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ABSTRACT

Spatial patterns on different scales, intertwined with ecological processes on different organizational levels, are an utmost important field of study in landscape ecology. Spatially explicit human impacts, whether direct or indirect, are among the most valued topics, and cartographic figures are a suitable way of presenting part of the obtained results. Historical and recent maps, and various levels of remote sensing, from orthophotography to satellite imagery, are among the sources of spatial information sought and studied. All of these information sources offer a vertical view, from top to bottom, with different spatial resolutions. Photographs taken at ground level, that offer a horizontal view, are equally useful. But between one and the other sets of data sources, there is a gap, either in scale or in privileged point of view to survey, fastly or accurately, places and landscapes. Recently, drones have emerged as perfect tools for observing and recording the spatial-visual properties of places and landscapes, and also to fill the aforementioned gap because they easily provide views from above, horizontally, and also oblique panoramic gazes, in bird's eye views. They are low-cost and easy-to-use equipment, although subject to some legal restrictions, increasingly powerful in features such as fly autonomy and image resolution. After the first generations of drones with RGB cameras, drones with multi-spectral and thermal cameras also became common, allowing to further deepen the analysis and interpretation of places and landscapes.

Incorporating curricular units that teach drone piloting and imagery use is an urgent need in Landscape Architecture and related fields globally. Despite the growing importance of drone technology in various domains, the integration of drones into educational curricula remains limited in many regions. This should follow a foundational focus on Photography, Place, and Landscape Representation. Similarly, greater concern and integration between landscape and site representation are emerging alongside the new challenges presented by the age of drones. Thus, this article seeks to create a conceptual model that serves as a basis for landscape representation challenges arising from recent technological developments, both at ground level and for photographs taken by unmanned aerial vehicles (UAVs).

The diagram, as well as conceptualised based on analytical and holistic values, is also tested in an exercise undertaken in Armação de Pêra, in the municipality of Silves, Portugal. It expresses a coherent methodology and results that prove the veracity and differences between ground and aerial photographs, subsequently associating them with cultural, social and religious values.

The aim of this article is to identify New Challenges for Territory and Landscape Photography Across Cultures in the Drone Era. The specific objectives are as follows: (i) to examine how culture influences landscape and place, which will be discussed in Chapter 2; (ii) to analytically conceptualise, through a theoretical diagram, the spatialisation of place and landscape, based on drone photography; and (iii) to conduct a case study that validates the established diagram. Thus, the article answers the following guiding question:

- How are the new challenges for territory and landscape photography perceived across cultures in the drone era?

This article consists of five main chapters. The first chapter characterises the study and its relevance. The second chapter presents the theoretical framework that sustains the thesis, based on the different cultures and representations of the landscape. The third chapter offers an analytical perspective on the various facets of landscape and photography, as well as conceptualisation through a diagram created. The fourth chapter tests the concept through a case study in Armação de Pêra, Portugal, using photographs taken with drones as well as ground-level images. The fifth and final chapter presents a discussion of the case study and concludes with the importance of integrating photography, technology and drones into curricular units on landscape representation.

Keywords: Photography, Landscape, Place, Cultural Landscape, Drone Photography, Landscape Photography

RESUMO

Padrões espaciais em diferentes escalas, entrelaçados com processos ecológicos em variados níveis organizacionais, representam um campo de estudo de extrema importância e relevância na ecologia da paisagem. Esses padrões e processos são essenciais para entender como as interações entre os elementos naturais e humanos moldam o ambiente ao nosso redor. Os impactos humanos, sejam eles diretos ou indiretos, emergem como alguns dos tópicos mais valorizados e discutidos neste campo de pesquisa. Nesse contexto, figuras cartográficas se destacam como uma maneira adequada e eficaz de apresentar parte dos resultados obtidos por meio de análises e estudos. Mapas históricos e recentes, bem como diversos níveis de sensoriamento remoto, que vão desde a ortofotografia até imagens de satélite, estão entre as fontes de informação espacial que são buscadas e estudadas com grande interesse. Todas essas fontes de informação oferecem uma visão vertical, de cima para baixo, com diferentes resoluções espaciais, o que permite uma análise detalhada das características de uma área específica.

As fotografias tiradas em nível do solo, que oferecem uma visão horizontal, também são igualmente úteis e valiosas para a compreensão da paisagem. Elas proporcionam uma perspectiva que pode captar detalhes que muitas vezes são perdidos em imagens aéreas ou satélites. No entanto, entre um conjunto e outro de fontes de dados, existe uma lacuna significativa, seja em escala ou em um ponto de vista privilegiado, que permite pesquisar lugares e paisagens de maneira rápida ou precisa. Recentemente, os drones surgiram como ferramentas perfeitas e inovadoras para observar e registrar as propriedades espaciais e visuais de lugares e paisagens. Esses dispositivos modernos têm a capacidade de preencher essa lacuna mencionada, pois oferecem facilmente vistas de cima, de forma horizontal e também olhares panorâmicos oblíquos, em vistas semelhantes a um olhar de pássaro.

Esses dispositivos, que podem ser considerados equipamentos de baixo custo e fáceis de usar, embora estejam sujeitos a algumas restrições legais, estão se tornando cada vez mais potentes em recursos, como autonomia de voo e resolução de imagem. Essa evolução tecnológica tem permitido que usuários, desde amadores até profissionais, capturem imagens com uma qualidade impressionante e a uma escala sem precedentes. Após as primeiras gerações de drones equipados com câmeras RGB (Red, Green, Blue), drones com câmeras multiespectrais e térmicas também se tornaram comuns no mercado, permitindo uma análise e interpretação mais profundas e detalhadas de lugares e paisagens, abrangendo aspectos que vão além da simples visualização.

A incorporação de unidades curriculares que ensinam pilotagem de drones e uso de imagens é uma necessidade urgente em Arquitetura Paisagística e em áreas relacionadas em todo o mundo. Apesar da crescente importância da tecnologia de drones em vários domínios, a integração dos drones nos currículos educacionais continua a ser limitada em muitas regiões. Essa integração deve seguir um foco fundamental em Fotografia, Lugar e Representação da Paisagem, reconhecendo a relevância desses aspectos na formação de profissionais que atuarão em contextos variados. Da mesma forma, uma maior preocupação e integração entre a representação da paisagem e do local estão surgindo, especialmente em resposta aos novos desafios apresentados pela era dos drones, que trazem consigo novas possibilidades e métodos de análise.

Assim, este artigo busca criar um modelo conceitual que sirva como base para os desafios da representação da paisagem decorrentes dos desenvolvimentos tecnológicos recentes, tanto em nível do solo quanto para fotografias tiradas por veículos aéreos não tripulados (VANTs). O diagrama, assim como conceitualizado, foi desenvolvido com base em valores analíticos e holísticos, e também é testado em um exercício realizado em Armação de Pêra, no município de Silves, em Portugal. Esse exercício expressa uma metodologia coerente e resultados que

comprovam a veracidade e as diferenças entre fotografias aéreas e de nível do solo, associando-as posteriormente a valores culturais, sociais e religiosos que enriquecem ainda mais a análise.
O objetivo deste artigo é identificar Novos Desafios para a Fotografia de Território e Paisagem Através das Culturas na Era dos Drones. Os objetivos específicos são os seguintes: (i) examinar como a cultura influencia a paisagem e o lugar, o que será discutido de forma abrangente no Capítulo 2; (ii) conceituar analiticamente, por meio de um diagrama teórico, a espacialização do lugar e da paisagem, com base na fotografia de drones; e (iii) realizar um estudo de caso que valide o diagrama estabelecido e suas implicações.
Dessa forma, o artigo responde à seguinte pergunta orientadora que direciona a pesquisa:
- Como os novos desafios para a fotografia de território e paisagem são percebidos nas culturas na era dos drones?
Este artigo é composto por cinco capítulos principais. O primeiro capítulo caracteriza o estudo e sua relevância, destacando a importância de compreender a relação entre tecnologia, representação e cultura. O segundo capítulo apresenta o referencial teórico que sustenta a tese, baseado nas diferentes culturas e representações da paisagem, demonstrando as visões ao redor do mundo de como as comunidades perceberam e percebem a paisagem, baseando-se em suas culturas locais e em detrimento de um intercâmbio de relações entre diferentes regiões. Esse capítulo aborda também como a globalização e a colonização interferem nesses mesmos conceitos, trazendo novas dinâmicas e desafios.
O terceiro capítulo oferece uma perspectiva analítica sobre as várias facetas da paisagem e da fotografia. Dentre esses aspectos, destaca-se o denominado "campo de visão humana", assim como sua área focal. Além disso, analiticamente, o artigo disserta sobre uma hierarquização a depender do ponto fotográfico desejado, bem como a conceituação através de um diagrama criado especificamente para esse propósito. O quarto capítulo testa o conceito por meio de um estudo de caso em Armação de Pêra, em Portugal, utilizando fotografias tiradas com drones, bem como imagens de nível do solo. Este teste visa examinar de forma empírica o diagrama criado, demonstrando resultados que associam a paisagem e o local com valores não apenas visuais, mas que englobam muito mais do que aquilo que se vê à primeira vista.
O quinto e último capítulo apresenta uma discussão do estudo de caso, respondendo ao porquê o exercício evidencia positivamente os conceitos previamente estabelecidos. Esse capítulo também responde ao objetivo geral e aos objetivos específicos, e conclui com a importância de integrar fotografia, tecnologia e drones nas unidades curriculares sobre representação da paisagem, reconhecendo a necessidade de preparar os alunos para os desafios e oportunidades que a tecnologia apresenta.
Em conclusão, a integração de drones no ensino de Arquitetura Paisagista e em áreas relacionadas é uma necessidade emergente que deve ser abordada de forma estratégica e consciente. À medida que a tecnologia continua a evoluir e a influenciar a maneira como percebemos e representamos o espaço, a educação deve acompanhar essas mudanças, preparando os estudantes para enfrentar os desafios do futuro de maneira informada e crítica. A construção de um modelo conceitual que interliga a fotografia de paisagens, o uso de drones e a representação cultural não apenas enriquecerá a formação dos alunos, mas também contribuirá para um entendimento mais profundo e significativo da paisagem e do espaço. A interdisciplinaridade e a colaboração entre diferentes áreas do conhecimento são fundamentais para o desenvolvimento de novas abordagens e práticas que respondam às demandas contemporâneas, preparando assim os futuros profissionais para um mundo em constante transformação.

Palavras-chave: Fotografia, Paisagem, Lugar, Paisagem cultural, Fotografia com drone, Fotografia de paisagem

CONTENTS

LIST OF FIGURES

LIST OF ABBREVIATIONS

UAVs	Unmanned aerial vehicles
FoV	Field of View
DATAR	Interministerial Delegation for Regional Planning and Development

CHAPTER 1 – INTRODUCTION

1.1 PHOTOGRAPHIC PERSPECTIVES IN MODERN LANDSCAPE ANALYSIS

The importance of territory analysis and landscape study in the modern era has become more significant in recent years, enhancing the central role of photography, especially the use of unmanned aerial vehicles (UAVs), commonly known as drones, for observation and spatial representation. The utility of technology, particularly photography as a visual document, is a persistent concern across many fields of knowledge (Antrop, 2006). Geographers, anthropologists, architects, landscape architects, biologists, landscape ecologists, and others stand alongside photographers to discuss the significance of photographic records and their documentary validity, while also acknowledging the right to individual and artistic expression of those who create and have created photographs. While these discussions can be valuable in their respective fields, there is generally a lack of analysis on how these characteristics can be integrated to fully utilise the potential of both ground-level and aerial perspectives in landscape studies. The basis of the human experience that is moulded within photography is important, and as Ignacio Bisbal Grandal (2011) states:

> *"La fotografía, como medio de representación e interpretación, (...) posibilita una mirada ambigua entre la inmediatez de la imagen y la reflexión interpretativa, y (...) posee un carácter documental pero al mismo tiempo contiene una fuerte carga de construcción personal y lectura subjetiva."* (Bisbal, 2011: 45).

In essence, the landscape is more than just a physical space, and the need to represent these spaces has persisted throughout history, evolving from ancient drawings and paintings to modern photography. These forms of representation allow for the capture of surroundings, whether they are familiar daily environments or novel locations encountered during travels (Tifentale, 2020). Consequently, as technology advances, the concept of landscape evolves accordingly. According to the Council of Europe Landscape Convention, it emerges from the dynamic interaction between humans and their environment:

> "a landscape is an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors" (Council of Europe, 2000).

This definition transcends the physical and enters the cognitive realm, where humans identify, delineate, and permeate territories based on their visual and spatial characteristics. The

poet Gerard Manley Hopkins introduced the term "inscape", suggesting a unifying principle that allows us to perceive a specific area, such as a stretch of countryside or sea, as a cohesive unit (Peters, 1948). This insight highlights the complex blend of natural and human influences that shape landscapes (Brady & Prior, 2020). A landscape can be seen as a portion of space perceived by the human senses, shaped by both natural and subjective factors, “a cultural image, a pictorial way of representing, structuring or symbolising surroundings” (Daniels & Cosgrove, 1988: 01). Otherwise, describing a landscape without understanding the visible and photographable world firstly is a hard task, and it is why Jeff Malpas establishes a profound distinction between place and landscape. The place is defined by a specific geographic area shaped not only by its physical form but also by human perception and interaction. It is constructed from cultural, historical, and personal perspectives. According to Jeff Malpas, place is fundamental for human existence, providing a framework that defines actions and shapes the understanding of surroundings. Places are dynamic, bounding both tangible and intangible aspects, serving as a backdrop to lives, and influencing and being influenced by actions and experiences (Malpas, 1999).

The latest studies about this topic explore the importance of how the human eyes receive, process, and comprehend the landscape and place itself. This unique perception relies not just on the physical world, but also upon the sensorial perception among humans. While perception involves all senses, vision dominates (Rodriguez & Dimitrova, 2011). Studies show that 80% of environmental impressions come from sight (Seiderman & Marcus, 1989). In this perspective, is correct to say that, in a certain way, seeing the environment can rely not only on real-time or on-site but can be captured by a timeless technological dispositive (Friday, 1999). José Mariano Gago declares that “photography is being with others, showing them, seeing. Photography is seeing.” (Ferreira, 2017: 100). See, in a *vox populi* description, by the Oxford Dictionary, is “to look at something in order to find information”.

1.2 THE ROLE OF DRONES IN LANDSCAPE ECOLOGY AND REPRESENTATION

Visual information can be gathered through various methods, and this study focuses on photography from both ground-level and aerial perspectives using drones. It also explores the holistic perceptions evoked by different types of framing. Drones, for modern landscape

photography, and consequently territory analysis, represent a revolution and an intense entrance into a new world. More than all, it is a body dematerialisation from a photographer's perspective or even a new dimension conquest, less physical, more virtual.

Photographs taken at ground level, which offer a horizontal perspective, are equally useful in landscape observation and documentation. However, there is often a gap between ground-level data and aerial analysis, whether in terms of scale or point-of-view. Recently, UAVs have rapidly emerged as effective tools for observing and recording the spatial-visual properties of landscapes, effectively filling the gaps previously mentioned. Drones can easily provide aerial views, horizontal perspectives, and oblique panoramic vistas, allowing for comprehensive views from above. For landscape architects, the importance of photography is evident in various aspects, particularly in project development and decision-making processes. It serves as an essential tool for landscape representation. When combined with cartography, demographic information, socio-economic data, and ecological insights, photography validates the chosen approach. However, it is often perceived merely to an end, without a real and conscious use of its theoretical and procedural aspects. There is a need for a conceptual expansion of photography that keeps pace with technological innovations (Godfrey, 2020).

Primarily developed as a military technology, just like aircraft and computers, the UAVs evolved from a defence and weapon perspective to a wider civilian practice and popular usage. This possibility was accompanied by an exponential increase in commercial drone production and the result is a breakthrough of a new visual universe (Rothstein, 2015). Commercial drones, particularly quadrotors - a type of drone that is equipped with four rotors, which provide lift and stability through coordinated movements, have rapidly transitioned from niche military applications to widespread consumer availability. Universities and tech companies played crucial roles in refining these technologies, paving the way for drones to become indispensable tools in fields like landscape ecology and visual representation (Bridle, 2020). A Drone offers a unique perspective from lower altitudes than traditional aircraft. Unlike aeroplanes, which operate at altitudes of 35,000 and 42,000 feet, or balloons that float between 1000 and 3000 feet, commercial drones generally fly below 400 feet or 120 meters, depending on the country's regulations. That lower altitude allows for more detailed images, both vertical and horizontal, of the Earth's surface. That is one of the key differential elements between a Satellite imagery or SIG too, while they change the site specificity for the prodigious expansion of mapping coverage, drones can improve by offering a closer and more detailed view (Kullman, 2017).

Furthermore, as drones have become more user-friendly, they have also catalyzed a new wave of innovation in landscape photography, allowing for perspectives and angles that were previously unimaginable. This technological leap has made it possible to capture the spatial-visual properties of landscapes in ways that are both comprehensive and visually compelling, bridging the gap between ground-level and aerial views and enriching our understanding of the environment (Bridle, 2020). The legs and arms, the hands and fingers, the eyes and decisive experience, gain new proportions. The photographer no longer needs to go, does not need to walk, or toil in search of the best framing. Instead, they send their camera mounted on the drone. They no longer experience and occupy the space, do not truly inhabit the location, and relinquish direct contact. They accept intermediaries that provide excellent benefits, in exchange for undeniable, but sometimes undervalued, drawbacks. The photographic equation now has, in summary, new criteria and new parameters. As Karl Kullmann says:

> "Nevertheless, innovation in mapping and imaging technology has clearly influenced the evolution of landscape architectural theory and practice. In the twentieth century, both the modern theodolite and aeroplane photography transformed the way in which landscape architects imaged, and hence designed, the landscape." (Kullmann, 2017: 1)

1.3 BRIDGING SCALES AND PERSPECTIVES

One of the main points of the study is the potentialization of drones, which provide particular features that not only enhance the unique point of view but also fill the gaps between different scales and perspectives in the landscape representation. It is important to say that not only does the scale difference rely on a new way of analysing the landscape, but also, in recent years, a new element has entered the equation. Since 2012, the human perspective is not only a tangible point of view but is co-participative with artificial intelligence's (AI's) infrastructure, which provides a radical change in the outcome result, due to the method it collects and processes visual information (Bassnett, 2024).

Throughout the past two decades, combined solutions emerged from AI's vision, and now human-generated photographs aren't the only visual perspective, performing tasks that previously required human intelligence. Now AI provides image recognition and tagging, recognising objects, faces, and even emotions in photos, identifying them accurately without

human input, but also implies an impact on the photography profession, with knowledge of AI tools becoming a crucial part of the modern photographer (Bassnett, 2024). At the same time, more than simply identifying people in an environment, machine learning classifies information or even, if required, translates data into a visual state. However, it opened a recent discussion of how AIs perceive cultural conceptions, guiding not only to patterns founded in landscape representation but to a historical bias that may lead to harmful discrimination when machine vision is implemented (Kronman, 2023).

Steyerl critiques contemporary photography by highlighting a fundamental shift in the role of images, from representation to projection. She notes that, instead of merely depicting reality, the images produced by advanced technologies "do not depict reality so much as produce it in the first place" (Steyerl, 2016: 182). The author argues that this shift transforms images into "power images," as they are no longer mediated by money but are, in fact, powerful in themselves (Steyerl & Paglen, 2020: 225). This functional change highlights a significant criticism about the photography world moved by contemporary AI. The technology, though it offers a new capability, frequently fails to consider the holistic and emotional dimensions of a human experience. Opposite to that, the new image world is conducted by specific parameters. As declared by Kronman in the article “Classifying Humans: The Indirect Reverse Operativity Of Machine Vision” specifically in the chapter “Data analysis: who is classifying and who gets classified in machine vision situations?” it is important to know and explore the idea of how those classifications operate upon pre-established prejudices, often shaped by concerns and values from its designers, and concluding unconsciously into poorly designed machine vision classification. However, beyond acknowledged limitations, in the areas of culture and spirituality expression, AI stands out in technical areas of landscape photography that involve precise and mechanical operations, such as upscaling images, reducing noise, and sharpening details. The fusion of human creativity and AI's technical precision could present an opportunity to enhance, rather than replace, the human touch in photography (Kronman, 2023).

Scale is another important factor that interconnects landscape photography and territory analysis. Since the development of satellite imagery and geographic information systems (GIS), mapping the world on bigger scales has become possible and more accessible to society and used in the daily routine. However, despite revealing cultural and natural patterns on a broad scale, the remote perspective of satellite imagery has recently exposed significant gaps, as the focus shifted towards expanding mapping coverage at the expense of finer detail and accuracy, whereby GIS is foremost an analytic tool (Couclelis, 2009). These limitations manifest in its

inability to capture subtle nuances and details in shadowed or underlying areas essential for a thorough site analysis. Beyond that, the detachment between reality and digital mapping resulted in a lesser priority in site verification, allowing a lower precision in local and more specific cases. In this context, drone technology highlights the possibility of finding a solution capable of repositioning aerial mapping closer to the ground, providing a more direct connection with the land. Drones have the advantage of operating at smaller scales, allowing for a higher level of detail than satellite images better-serving landscape architecture projects with flexibility and usability, where you can be on-site bridging a detailed and contextualised range of images in real-time. When combined with ground photography, where the true capability emerges, next-gen drones can find both perspective and scale equilibrium through a balanced connection (Rekittke *et al.*, 2013).

1.4 OBJECTIVES AND THESIS STRUCTURE

The aim of this article is to identify New Challenges for Territory and Landscape Photography Across Cultures in the Drone Era. The specific objectives are as follows: (i) to examine how culture influences landscape and place, which will be discussed in Chapter 2; (ii) to analytically conceptualise, through a theoretical diagram, the spatialisation of place and landscape, based on drone photography; and (iii) to conduct a case study that validates the established diagram.

Thus, the article begins with the following guiding question:

- How are the new challenges for territory and landscape photography perceived across cultures in the drone era?

This work consists of five main chapters. The first chapter characterises the study and its relevance. The second chapter presents the theoretical framework that sustains the thesis, based on the different cultures and representations of the landscape. The third chapter offers an analytical perspective on the various facets of landscape and photography, as well as conceptualisation through a diagram created. The fourth chapter tests the concept through a case study in Armação de Pêra, Portugal, using photographs taken with drones as well as ground-level images. The fifth and final chapter presents a discussion of the case study and concludes with the importance of integrating photography, technology and drones into curricular units on landscape representation.

CHAPTER 2 – FOUNDATION

2.1 LANDSCAPE ACROSS CULTURES

The concept of landscape encompasses a wide range of definitions, emerging from diverse cultural, ethical and religious perspectives. A solid foundation for understanding not only what we perceive, but also why we interpret space as we do, forms the basis for effective visual representation of landscapes. From a modern European perspective, as established by the European Landscape Convention (2000), "landscape" refers to a part of the territory, as perceived by both local people and visitors, which over time evolves under the influence of natural forces and human activity. In this vision, landscape is not seen merely as a physical entity but as a dynamic space that explores the interaction between people and their environment, reflecting cultural, social and religious values. This definition also enhances the connection between territory and ecology, calling public involvement a central role in its protection, management, and planning, enhancing landscape through a collaboration between professionals and local communities, and addressing the complex interplay of natural and socio-economic forces.

It is interesting to note that “landscape ecology” terminology emerged in the late 1930s, with a European creation by the German geographer Carl Troll. Since the European landscape definition relies upon the depth of environmental care, landscape ecology was inspired by the possibilities of aerial photo interpretation and laid the foundation for the nomenclature, which focused on understanding the complex cause-and-effect relationships between living communities and their environments (Schreiber, 1990). The practical side of landscape ecology has become increasingly evident over the years, evolving into an integration of ecological principles and their applications in land use, planning, and management. In the post-war period, with increasing urbanisation and pressure on natural resources, landscape ecology in Europe expanded beyond the academic field, directly influencing territorial planning practices. Especially in the Netherlands, in 1972, with the creation of the infame Society for Landscape Ecology, where scientists and practitioners expanded the concepts in different variations, probably the result of the natural challenges of this small country, not taking into account the holistic aspect but only the scientific one (Schreiber, 1990). Later, in Germany, the concepts adapted from Trolls by Reichholf (1983) became even more active and practical, considering the ecological processes of the landscape and including the human being in the research, between theoretical and practical problems. In addition, landscape ecology began to encompass

the interdisciplinary aspect of geography, territorial planning and landscape architecture (Reichholf, 1983).

As described by Zonneveld (1982), diversification occurred at this time as a result of adapting to socio-economic realities, especially in the Netherlands, demonstrating in practice how much the environment influences definitions at the local and international levels. In this case, the natural and demographic challenges in the Netherlands, reflect the country's geographical uniqueness and high population density, requiring rigorous and detailed planning in both the environmental and urban spheres, with a need to balance urban development, the preservation of agricultural areas and the conservation of natural spaces. The Dutch territory, largely made up of land below sea level, has historically faced the constant threat of flooding, causing the concepts explored at the time to emerge out of a cultural-territorial need, first emerging from a real-world to solutions found in conceptual and scientific landscape ecology principles (Zonneveld, 1982). Later on, those principles were supported at the European level, with the European Landscape Convention (2000), in a definition more geared towards public support, aimed at planning and protecting landscapes, promoting integration between environmental conservation and sustainable use.

Another important concept, beyond the landscape ecology perception inspired by the European perspective, is the “cultural landscape”, which is simple but complex, and in some circles is just known as “landscape”. To better comprehend this fundamental and basilar concept, it is crucial to clarify what it is not. Many times, the terminology is confused with the concept of designed landscape or landscaping. In some cultures, it may be seen just inside specific contexts, such as rural regions, or associated with “other” ethnic-racial groups like Pennsylvania Germans, Cajuns, Hopi, but never linked with his own environment. This limited perception can lead to the mistaken belief that cultural landscapes refer exclusively to the ‘exotic’ and not both quantitative and qualitative evolving places. A true understanding of the cultural landscape involves considering the interactions between people, their cultural practices and the environment over time, reflecting the complex relationship between identity, space and culture (Dilsaver, 2009). The modern definition of cultural landscape not only emphasizes human integration but also serves as a valuable multidisciplinary tool. Over the past forty years, cultural geographers have built upon the foundational work introduced by Professor Carl Ortwin Sauer in 1925. In his seminal study, "The Morphology of Landscape," Sauer laid the groundwork for understanding how landscapes are shaped by human activity and cultural processes. They levelled up the concept by questioning its status as a material thing, collecting

historical information that investigates not merely the world we see but a construction that goes beyond the morphological sense (Dilsaver, 2009).

One of the main characters that studied the historical draws and the philosophic side of landscape, is the cultural geographer Denis Cosgrove, bringing a perspective that was ignored before by Sauer, emphasizing individual actions over collective or social processes in the creation and transformation of landscapes. His classical and widely spread landscape definition relies upon the fact that the globalization process makes the representation elitist or commonly seen as constructed by outsiders:

> "The landscape idea represents a way of seeing – a way in which some Europeans have represented to themselves and to others the world about them and their relationships with it, and through which they have commented on social relations. Landscape is a way of seeing that has its own history, but a history that can be understood only as part of a wider history of economy and society." (Cosgrove, 1998: 14).

From a Greek perspective, it is possible to see that the outsider viewpoint has a large influence on the way they perceive landscape. This external gaze, often coming from travellers or scholars from Western countries, shaped the narrative of the Greek landscape throughout history. Interestingly, these interpretations were formed 'from the outside' and 'from above,' placing the foreign observer at the centre of the viewing process while the local population remained in the background. The inhabitants of these landscapes were often reduced to passive figures, unaware of the land's perceived beauty or historical significance. In this sense, the locals were not seen as participants or agents in shaping the landscape, but rather as part of the scenery itself, reinforcing the disconnect between local understanding and foreign interpretations (Vöhler *et al.*, 2021). The landscape was merely an external view of nature, observed from the outside as an imaginary idealized landscape since the Renaissance, and expressed artistically as a way of representing imagining antiquity through a visual poetical landscape, such as painting, poetry, theatre, architecture and importantly, the first steps of classical landscape architecture with landscape designed projects (Vöhler *et al.*, 2021). But as we see that cultural landscape is a non-transmissible experience, it can't be measured with just a material or inside the real realm. As Cosgrove argued with coeditor Stephen Daniels, it is important to perceive the balance, a reconciliation between the landscape's dual material and immaterial character (Dilsaver, 2009). In practice, a park is more palpable than a landscape

representation - landscape painting or poem - but it isn't more real or imaginary, because a landscape is based on experience, appropriation and symbolism (Cosgrove, 1989).

So, when a traveller comes to Greece in that romantic and idealised era, they are led by their preconceived images and consequently to a positive discovery or frustration. This conception of landscape is based on a single unity - aesthetic frames - and often doesn't include the 'live' presence. However the imaginary landscape relies on representation, in many situations is possible to find a surprise from the traveller's eyes when comparing the artificial or imaginary landscape with its real landscape (Vöhler *et al.*, 2021). The case is commonly seen in another culture, especially when a transcultural study puts its lenses inside a closed community. A very instructive example is given by Ikemefuna Okoye, in the densely settled Igboland of southeastern Nigeria, where the European perception of landscape dramatically altered local interpretations in the modern era. For the Igbo, some spaces, or as called non-places, like *ajo ofia* - a wild area used for ritual purposes; a public site created to be seen from the outside - were essential for social and spiritual life, bridging a visually designed object owned by the community and a sense of silence. These places, which seemed uninhabited and chaotic to foreigners, had deep meanings and functioned as part of the community's management of the landscape (Okoye, 2002). While Europeans saw the wilderness as something to be conquered or domesticated, local communities had an emotional attachment to the land, and a relationship with the environment, seeing it as both a resource and a space for spiritual practices (Okoye, 2002).

As Ikemefuna Okoye points out, Europeans approached African landscapes with preconceived notions shaped by their own cultural experiences and religious beliefs, transforming what was perceived as "evil" into "good" (Ranger, 1999). A clear illustration of this can be seen in the Matopos Hills, located south of Bulawayo, Zimbabwe, an area rich in rock art that holds significant cosmological meaning for the local communities, blending African aesthetic perceptions with their natural environment (Pwiti & Ndoro, 1999). In the 1940s, Christian missionaries, such as Father Edward Paterson, established the Cyrene Mission in this region. The mission was notable not only for its religious activities but also for its unique integration of African artistic traditions with Christian themes. Paterson encouraged local artists to express African life through a Christian lens, reinterpreting the native spiritual symbolism that had long been tied to the natural landscape above the great granite shield. The creation of a chapel at the Cyrene Mission served as both a place of worship and an art representation (Garlake, 1995), and, in this way, the missionaries, particularly through the influence of the

Cyrene Mission, reshaped the Matopos landscape by adding a Christianized point of view (Ranger, 1999). The Matopos Hills, once understood through the indigenous cosmological approach, were reimagined as part of a redemptive Christian narrative, reconfiguring the African landscapes, both physically and symbolically, often reshaping or correlating the deep cultural meanings these places and non-places held for local communities (Pwiti & Ndoro, 1999).

The process of colonization and modernization has led to changes in how African landscapes are perceived and represented (Luig & von Oppen, 1997). Even though African languages don't have an exact word for “landscape” or “nature”, Cohen and Odhiambo (1989) state that many of the terms used for land and territory are associated not only with the physical aspect but also with existence, such as religious and social practices and relational connections, in addition to the more common aspects of rural usage such as field, wilderness, bush, etc. Traditional views, that used to see nature loaded with meaning and power of its own, are often reconfigured in response to new socio-economic and political realities. This transformation involves adapting old practices and meanings to a globalised context, sometimes leading to conflicts between traditional and modern interpretations of the landscape (Ranger, 1999). While rural African populations maintain a deep connection to their environment, this interaction includes both aesthetic appreciation and symbolic meaning. The aesthetic of nature in Africa is not merely about visual delight but embraces a larger spectrum of holistic and spiritual significance (Okoye, 2002). Terence Ranger has proposed a debate that colonial perspectives often imposed a foreign view of African landscapes, framing them as “wild” or “untamed” and with a strong contrast to European ideals. These projections sometimes clashed with local understandings, which were more nuanced and integrated into the community's spiritual and practical life. The ongoing interplay between indigenous and colonial views reflects a complex historical dialogue that continues to influence modern perceptions (Ranger, 1999).

Not only do African natives face obstacles due to globalization and colonialism; Native Americans have long struggled with similar challenges, especially in how their perceptions of landscape have been overlooked. For many years, their perspectives were studied superficially, often reduced to symbolic interpretations. To preserve this vast understanding of landscape, it is crucial to adopt not only a boundary-based approach but also a more humanistic and anthropological view. In many Native American communities, the landscape is seen as an interconnected web of relationships between humans, animals, spirits, and ancestors. Much like the African ancestral perspective, it is not merely a physical space but a living entity filled with

mystical significance and collective and individual experiences. In other words, the land is often sacred, holding stories and histories passed down through generations, a view not aligned with modern capitalist ideas of ownership (Basso, 1996). For many tribes, such as the Lakota and Navajo, the landscape and nature are deeply tied to their spiritual beliefs. The land is seen as a mother or the body of a higher deity, which demands respect, care, and worship (Grinde & Johansen, 1995). Certain natural features, like towering mountains, rivers, and forests, serve as intermediaries between the natural world and the spiritual realm, making the landscape not just static, but essential to religious and cultural practices (Nabokov & Loendorf, 2004).

The Hopi community, a Native American tribe from the southwestern United States, is a good example in the context because it carries a unique and profound spiritual connection with its landscape, being one of the main pillars of its cultural and religious identity. For the tribe, the land is alive and sacred, and their beliefs rely upon the agriculture routine. The Hopi farmers, who utilise rainfed farming, cultivate corn, beans, and squash in dry soils, not depending on periodic artificial irrigation, but from sporadic natural rains and the moisture trapped in the earth itself (Malotki, 2000). This practice is not just about the method of planting but demonstrates the essence of the cultural landscape vision that the Amerindians hold, as the act is seen internally as an interaction between the community and the spiritual forces of the land (Ferguson & Colwell-Chanthaphonh, 2006). Planting is an act of reverence, an act of worship with specific ritual ceremonies and regular prayers that guarantee that the rain will come and nourish the harvest seeded (Whiteley, 1988). In addition, every year the Hopi men grow vegetables in line with their religious calendar and connect the landscape and agriculture to the cycles of the seasons and celestial bodies.

Also, through the *Niman Kachina* - Home-Going Kachina – ceremony (see figure 2.1), they emphasise their bond with the place, believing that the nearby mountains are dwelling places of these spiritual beings, the Kachinas, which demonstrates how the landscape is integrated into their spiritual vision of the world (Ferguson & Colwell-Chanthaphonh, 2006). Another concept that highlights the spiritual side between the landscape and the natives is the "*Tuuwanasavi*", which holds a central space in Hopi cosmology and their worldview. Translated as the "Central Place", *Tuuwanasavi* refers not only to a physical space but to a spiritual and cultural epicentre (Whiteley, 1988). According to Hopi belief, this is where their spiritual guides instructed them to settle, and where the vital forces of the universe converge in their land (Malotki, 2000).

Anthropologists over the past three decades have played a central role in classifying the meanings of landscapes for various groups, with cultural landscapes being a key theme. These groups, classified by Matthew J. Liebmann as "Landscapes of Meaning" (LoM), were also explored by archaeologists in the past. They sought to integrate ancestral factors with the contemporary thoughts of the native peoples currently living on the land. In the United States, for the scientific archaeological study of these peoples, the term “the Southwest School of Landscape Archaeology” was created, which has transformed in recent years the way archaeologists study American landscapes in the Southwest. The “LoM” framework explores cultural values, and the historical aspect manifested in the landscape itself, striving to understand both the present and the past by documenting the perspectives of contemporary Indigenous communities, as well as the lands their ancestors once inhabited (Liebmann, 2001).

Just as there is now a variety of methods that study and classify landscapes, particularly by crossing interdisciplinary areas, the “LoM” method is not unanimous. It has been questioned for blending past and present information in a way that some see as incautious, considering that landscapes and native cultures are not static (Ingold, 1993; Cosgrove, 1998). This approach could lead to a homogeneous and tautological view without beneficial outcomes. As Liebmann states, “Despite these criticisms, archaeologists should not reject the approaches advocated by the Southwest School of Landscape Archaeology quite yet. Rather, these critiques are evidence of a maturing field. The contributions of the Southwest School include new methodological approaches and innovative propositions about the past and draw attention to previously overlooked aspects of archaeological landscapes” (Liebmann, 2001: 645). He further argues that the primary factor that could serve as a theoretical basis for archaeologists, which, however, is not yet clear, is the meaning itself. As Cosgrove notes, place is extremely complex, with multiple layers of symbolism and meaning, where many cultures meet and may come into conflict (Cosgrove, 1999).

But what if the community itself defined its aesthetic landscape preferences? Not merely through an outsider or coloniser’s point of view, as seen in cases with African tribes, Native Americans, and the Greeks. This intriguing factor has led to studies like that of Byoung-E Yang and Rachel Kaplan. The chosen design for gardens, for instance, is crucial in differentiating between Western and Eastern methods. The differences between Japanese and Korean gardens are subtler, based on various layout aspects such as stone types, water use, depth, and scale (Kuitert, 2002). While European gardens grew out of a pursuit of perfection, symmetry,

geometry, and grandeur, Eastern landscape aesthetics are oriented towards a more organic and living definition (Rogers, 2001).

Yang and Kaplan's study, "The Perception of Landscape Style: A Cross-cultural Comparison", sought to understand the differences between the views of native populations and the artificial tourist perspective, which bases its aesthetic decisions solely on past representations and its own cultural appropriation. The researchers presented a series of varied landscape images to participants from diverse cultural backgrounds, focusing on a comparison between Western and Eastern groups, and asking them to rank the landscapes according to their preferences. The landscapes included both natural and artificial environments, with aesthetic variations. The results showed that both Western and Oriental participants demonstrated a greater appreciation for environments that reflected harmony and natural balance. Furthermore, cultural experience and urbanisation contexts significantly influenced the evaluations. For example, participants from densely urban areas tended to value more open landscapes, while those from rural areas preferred more enclosed and natural landscapes. Western participants tended to prefer more open and structured landscapes, valuing visual clarity and formal organization. Eastern participants, on the other hand, showed a greater appreciation for more complex and intimate landscapes, with an emphasis on subtle integration between humans and nature. Thus, it is possible to conclude that although there are universal elements in the perception of landscapes, cultural contexts play a fundamental role in shaping preferences and attitudes regarding Western and Eastern landscape styles (Yang & Kaplan, 1990).

The bridge between landscape and its representation is meaning, the landscape is not neutral and serves as an empty canvas painted by the human experience, a way that a tribe, community, country or continent can express physically their sense of belonging, cultural and spiritual beliefs (Cosgrove & Daniels, 1988). This perspective highlights that landscapes are shaped by and reflect the cultural lens through which they are observed, and that's why landscape representation is more than what we see. As Yi-Fu states, through a "cultural lens", a landscape might be interpreted as sacred, mundane, or aesthetically pleasing based on cultural norms and personal experiences, often, what is observed, is that different culture's view landscapes not just as physical spaces, but as places imbued with meaning (Tuan, 1977). The process of cultural lens development is natural and spontaneous, passing through humans through traditions, values, celebrations, and rituals to the next generation. Consequently, the filter works as a pre-judgment that is never only objective, instead, the lens works based on a cultural understanding. A fair example is a farmer who might see a rural landscape as a

productivity opportunity, but when compared with a person with daily urban experience, they can be delighted by its aesthetic peculiarities (Berger, 1972). As Berger, J. states in “Ways of Seeing:

> "Seeing comes before words. The child looks and recognizes before it can speak. But there is also another sense in which seeing comes before words. It is seeing which establishes our place in the surrounding world. We explain ourselves to ourselves through our vision. And yet, when we look at the world, what we see is not simply the result of our personal experience. Our perception is also influenced by the cultural and social context in which we live. We see the world not just as it is, but as our culture has taught us to see it." (Berger, 1972: 07).

Figure 2.1: Hopi dancers, wearing Hemis Kachina masks and sprigs of evergreen, lined up at a pueblo in Arizona during the Niman Kachina, or Going Home Ceremony, in the month of July. Photographed c.1913. © Photographer unknown. Part of the Kachina Ceremony Documentation Series.

CHAPTER 3: LANDSCAPE AND PHOTOGRAPHY

3.1 THE ANALYTICAL PERSPECTIVE

The landscape interacts with its observer, and one of the key elements that amplifies the human sensory experience is the landscape representation. There are many ways to represent landscapes, such as poetry, painting, and more recently digital formats, each offering a unique perspective that enhances our understanding and appreciation of the environment. Landscape representation serves as a method of readability and intelligibility of what is real, breaking old disciplinary boundaries and creating intersections between the scientific background, artistic expression and public sphere (Cosgrove, 2008; Domingues, 2012).

As art evolved, the landscape representation became more realistic in a certain way, driven by a desire to capture the true essence of nature, and not only in an aesthetic way but urged by a necessity of understanding the place analytically (Gombrich, 2000). Artists like Leonard da Vinci and Albrecht Dürer, in the Renaissance period, forged a significant shift in landscape representation, emphasising detailed and accurate portrayals of natural scenery (Clark, 1956). This period saw the emergence of perspective techniques, allowing for more realistic spatial representations. Afterwards, in the 19th century, the Romantic period and the subsequent impressionist movement adapted the bucolic vision and the landscape representation. Artists such as J.M.W. Turner and Claude Monet focused on the emotional aspects of landscapes, rather than just strictly capturing, through art, a realistic vision, highlighting the subjectiveness, where personal perception and emotional appropriation became meaningful to the portrayal (Pioch, 1999). This shift was explored in such different ways that in the 20th century, with the introduction of modernism and post-modernism, the representation was filled by a closer look into human experiences, being represented by abstraction, deconstruction and interpretations of the environment (Krauss, 1986).

Over the last two decades, cultural geography has leaned over expressively about the topic, exploring the visual arts and how landscapes were and are represented and interpreted. Historically, landscapes were represented in art reflecting human interactions with their surroundings, often idealising or dramatising the human connection or relationships, and in the modern era studies have expanded to include not only traditional forms of seeing but landscape as a subject in photography, as a material in landscape designing (Daniels, 2014). This broad engagement with photography and representation led to an unprecedented need to explore

aspects of this type of capturing landscape, including the human visual field, photographic points, framing, and viewpoint.

3.2 HUMAN FIELD OF VIEW

The Human Visual Field, or Human Field of View (FoV), refers to the visual range of the human eye without the eyes or head movement. This camp is measured in degrees and is fundamental to the understanding of how people perceive the world around them, and how to expect to capture and recreate the human visual experience. Earlier studies by Adams (1971), suggest that the human "FoV" is approximately 180 degrees horizontally. However, while this study provided a primary foundation, more recent research has refined these measurements (Adams, 1971). Nowadays, current studies indicate that the horizontal "FoV" reaches approximately 210 degrees, while the vertical "FoV" is around 150 degrees (see figure 3.1), consequently establishing a 7:5 ratio in the natural view range (Retho, 2010).

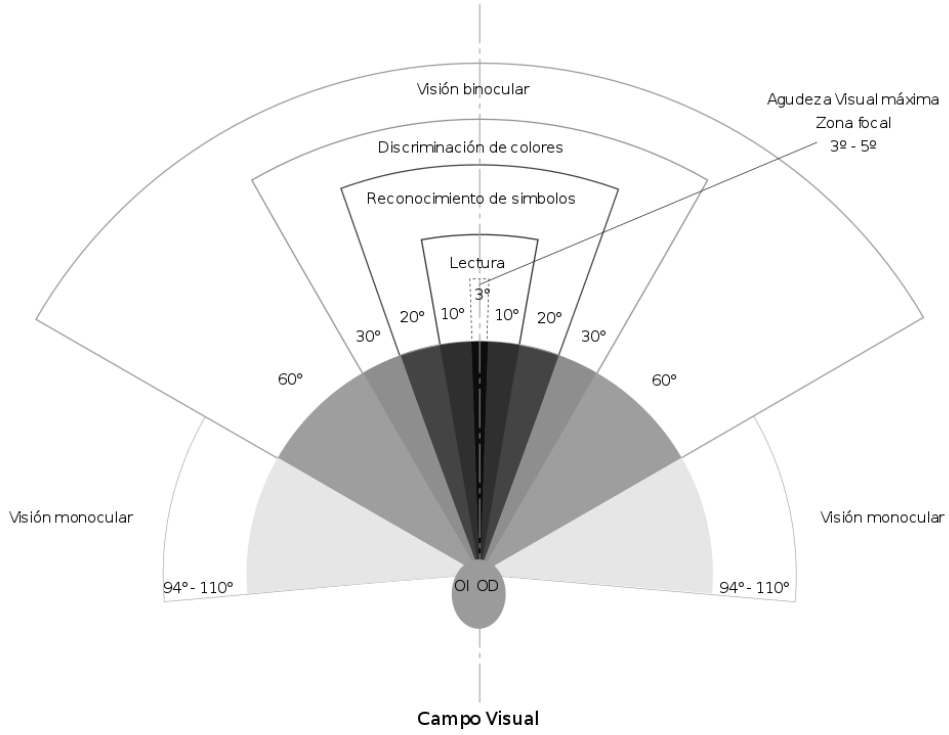

Figure 3.1: Representation of the Human FoV. *Source: Retho, 2010*

Nevertheless, the 7:5 ratio is just a simple approach and doesn't consider the three-dimensionality or effectiveness. So, a more judicious analysis points to a horizontal visual range with a three-dimensional perception of around 120 degrees and particularly effective vision with a range of around 60 degrees, with a vertical amplitude quantified around 120 degrees and "FoV" slightly shifted downwards by 10 degrees. Particularly effective vision can also be assumed for a range of around 55 degrees, pre-assuming that eye movements occur without effort (see figure 3.2).

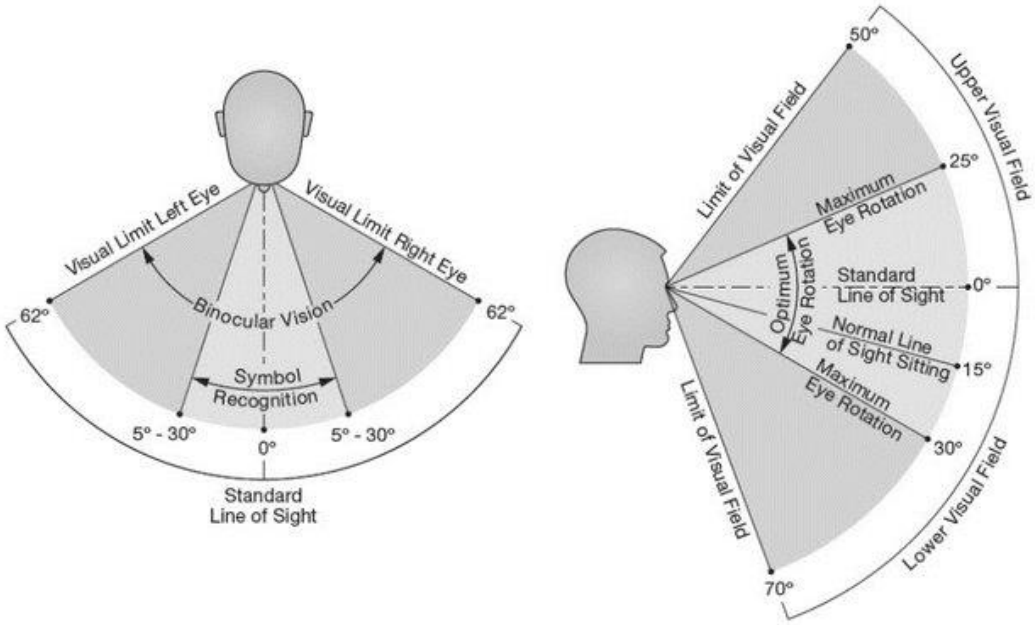

Figure 3.2: Representation of the human "FoV", incorporating three-dimensional perception
Source: Retho, 2010

The human eye, in a natural way, doesn't happen with the head and eyes completely still. Similar to vertical eye movements, which occur with a limited range, automatically, and without any noticeable effort, the head's horizontal movements are also realised naturally, often instinctively. These horizontal movements, when compared to vertical eye movements, present a significantly greater amplitude. This leads to an important conclusion - the natural human "FoV" does not follow a fixed ratio of 7:5 or roughly 1:1, but instead implies a proportion in which the horizontal axis predominates over the vertical. This differentiation is fundamental for understanding the human field of vision on a daily routine, as well as the challenge of modern landscape photographic representation and cinematographic perception.

Considering the practical application of this observation, especially in optic technologies, the camera Hasselblad XPan example stands out, by offering a ratio of 2,70:1, as known as a panoramic format, providing a final frame that more accurately reflects the horizontal visual field of the human sensation. Choosing a panoramic framing like this seeks precisely to reproduce the natural range of the human "FoV", especially for capturing landscapes or wide scenes, where horizontal perception is crucial. This reinforces the idea that the design of cameras and lenses must consider the complexity of the human eyes, not just from a bidimensional sense, but also in its three-dimensionality and perceptive dynamics. This challenge is not just technical but also refers to a deeper understanding of the interaction between the human eye and optical devices, a theme explored in the last decade by researchers of visual perception and photographic technology (Goldstein, 2013; Bruce, Green & Georgeson, 2014). As illustrated in the panoramic photograph (Figure 3.3) by Josef Koudelka, the format of the image significantly shapes the context. While the central object remains the focus, the sense of grandeur and scale of this seemingly solitary human endeavour - an enormous factory in an abandoned area - could be diminished with different framing.

Figure 3.3: Panoramic photograph captured with the Fujifilm Panorama G617 Professionnel 3x1 (3.00), depicting the city of Dunkerque, Sollac, in the Nord-Pas-de-Calais region, France, 1987. © Josef Koudelka & Magnum Photos. Part of the Industrial Landscapes series.

With the increase in automation within photography brought about by contemporary technology, the sense of framing and in-depth perception of context has been pushed aside. However, landscape photography, in general, should not only be functional in general aspects but should be a common tool, well utilised in all aspects for a better representation of what is actually seen. This question is shared today by the community of traditional landscape photographers:

> *"El fotógrafo se ha convertido en un mero usuario de los medios técnicos puestos a su disposición. Esta relación se puede describir como um proceso de mutuo feedback entre la industria fotográfica y el fotógrafo: la cámara es programada para producir los tipos de imágenes que corresponden a ciertas convenciones generales. En otras palabras, éstas constituyen el código. Puesto que los resultados erróneos son casi siempre ocasionados por un uso erróneo del aparato, el margen de manipulación ha de ser reducido al máximo, por ejemplo, reemplazado por un automatismo. El aparato "perfecto", así, es aquel a través del cual la decodificación está absolutamente regulada por un programa automático y que por lo tanto ya no requiere instrucciones de manejo."* (Andreas Müller-Pohle, 1985)[1].

3.3 PHOTOGRAPHIC POINTS

Nowadays a challenge that emerged and can be seen in the photographic world is the necessity for creating an ideal and plastic experience. Many landscape architecture companies, that promote marketing materials, are spotted representing the landscape with intentionally aesthetic choices to catch attention. Alan Ward describes it as "iconic photographs", well produced, with an intense experience of light and space. Anne C. Godfrey says that "these photos are often made at the end or beginning of the day to catch the most colorful and dramatic light produced by the lower angle of the sun, and other atmospheric occurrences, such as clouds and fog)" opening a discussion of how to categorise those types of photography and landscape representation, exploring photographs framing and composition (Godfrey, 2020). Godfrey not only writes about the characteristics of those built-work photographs but also explores a method of how to 'replicate' a landscape viewer's actual experience, concluding that built-work

[1] Cited by Joan Fontcuberta, in *The Kiss of Judas, Photography and Truth*. Editorial Gustavo Gili, Barcelona. 2011, 1st edition 1997.

photography is “more dynamic and interested in the picturesque, favors legibility, strong form and strong colors” and when trying to replicate the common “user’s viewer photography” it catches another type of attention dwelling “more in the area of visual resource assessment (wich strives to create a set of criteria and repeatable methods for defensible documentation of land-use decision making)”. The method was tested by choosing normal times of visitation, framing living objects into the frame, and also average human standing eyes height.

Utilising the human eye height to portray a more natural representation characterises a type of “photographic point”. A theme explored over the past century by Henri Cartier Bresson and showcased in his book “The Decisive Moment” exploring the perception of composition and how “the photographer's eye is perpetually evaluating”, affirming that “a photographer can bring coincidence of line simply by moving his head a fraction of a millimetre. He can modify perspectives by a slight bending of the knees. By placing the camera closer to or farther from the subject, he draws a detail – and it can be subordinated, or he can be tyrannized by it” (Cartier-Bresson, 1952: 08). The choice of photographic points also influences how we interpret visual art, including photography. As Barthes (1981) explores in his analysis, the way humans understand and take certain photographs is deeply connected to personal experiences and emotions that shape perception, and by exploring different approaches a photographer may intentionally play a crucial role in shaping not only the technical composition of an image but also the emotional connection between the photographer and the viewer (Barthes, 1981).

The photographic points used to construct the frames can be categorised into two main classes - usual or ordinary: different or creative. The usual ones resemble the points of view of adult humans, as the experience conducted by Godfrey (2020), by positioning the camera about 1.6 meters above ground level and forming an angle with the horizontal (tilt) close to 0º. The different category is the opposite of the usual and can provide creative framings. Furthermore, drawing from common practices observed in the current landscape photography, it becomes possible to establish sub-classes of photographic point structure based on two parameters:

1. Height above ground level:

- Considerably higher than 1.6 metres.

- At about 1.6 metres.

- Considerably below 1.6 metres.

2. An angle formed with the horizontal (tilt):

- considerably higher than 0º.

- close to 0º.

- considerably less than 0º.

In summary, this classification has three hierarchical levels and a total of seven classes:

- (1) Usual photographic point, 1.6m.

- (2) Different photographic point, above 1.6 m and with a tilt greater than 0º.

- (2) Different photographic point, above 1.6 m and with a tilt equal to 0º.

- (2) Different photographic point, above 1.6 m and with a tilt less than 0º.

- (3) Different photographic point, below 1.6 m and with a tilt greater than 0º.

- (3) Different photographic point, below 1.6 m and with a tilt equal to 0º.

- (3) Different photographic point, below 1.6 m and with a tilt less than 0º.

Ansel Adams, one of the most impactful photographers of the 20th century, was recognised not only for his display and printing techniques but also for his preference for photographic points with elevated perspective. In his most remarkable works, he frequently positioned his camera above 1.6 metres and used a tilt of greater than 0º, classified inside the third established hierarchical fraction. This preference allowed him to capture the magnitude and depth of the natural scenery, as he affirmed “an elevation in camera position intensifies the perception of scale and the relationship between the elements of the landscape” (Adams, 1981: 29). He spent decades exploring the American landscape, documenting visually the places by often using his vehicles as platforms to steady his weighty equipment (see figure 3.4) - a series of large vehicles such as De Soto limousines, Ford Woodies, and later Chevy wagons that could now be classified

as SUVs (Kirk, 1999). His approach not only offers a different perspective but also invites the viewer to experience the magnitude of the scenes in an immersive way (Adams, 1992).

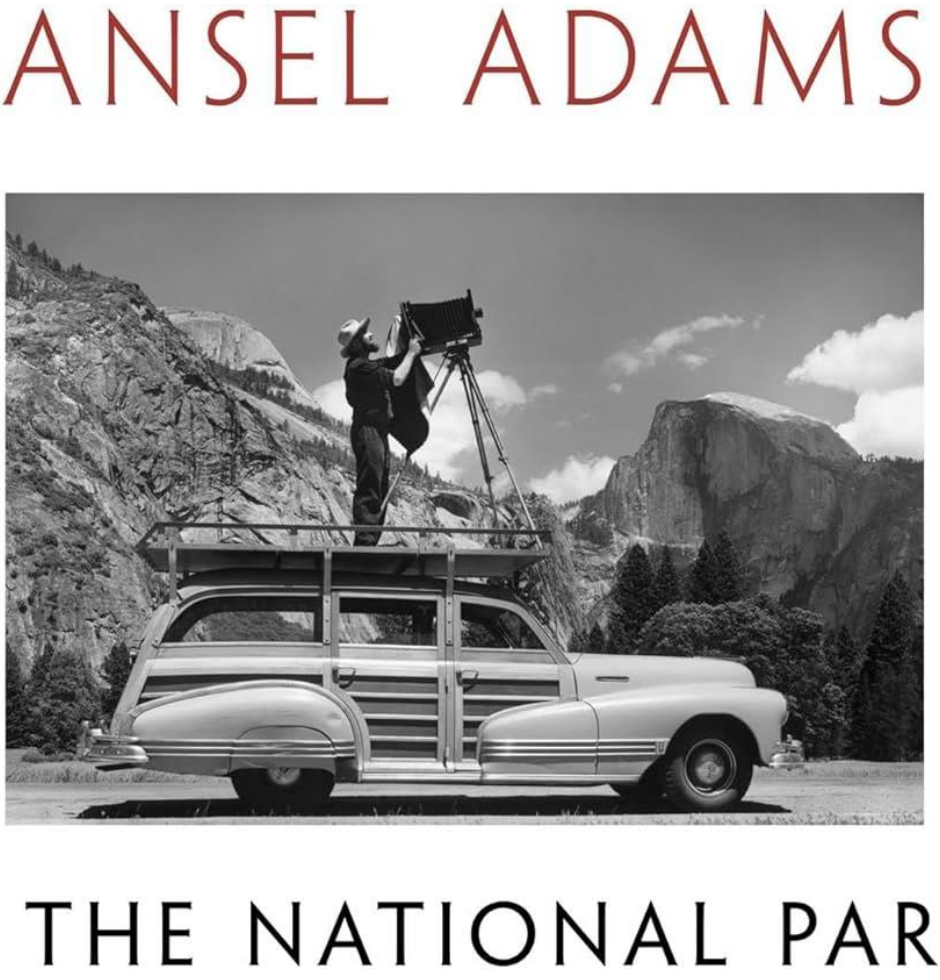

Figure 3.4: Ansel Adams on top of his Ford Woody station wagon around 1942 in Yosemite National Park. Adams is on a mounted platform to support his large format camera on a tripod, exemplifying his innovative approach to landscape photography. © Cedric Wright.

Framing is a concept that explores two different perspectives - visual framing and temporal framing (as used by Barthes). Visual framing encompasses the formal framing, or format of the image (1x1, 5x4, 4x3, 3x2, 16x9, etc.), and the authorial framework (the elements that remain in the photographic record and those that don't), as a result of the photographer's intentional decisions to emphasise certain visual elements of reality to the detriment of others. It implies selection, highlighting and minimising. Often the photographer is not particularly focused on what he is going to show, but rather on the language he is adopting to show it and, at the same time, to convey messages that stimulate sensations and emotions in his audience. Messages that may even be particularly geared towards drawing attention to a theme or problem, be it socio-

economic or environmental, to highlighting its context or its origins and causes, to conveying assessments and judgements according to certain criteria and values, too, in particular situations, suggesting possible solutions to that same theme or problem. As Bock (2020) says "to frame is to create an image as a photographer, and the 'frame' is in the camera" (Bock, 2020: 05).

Even if framing can present many solutions, in modern days the ground level can't cover all necessities. But a question remains - When is supposed to photos require higher perspectives? To answer this question so pertinent to the present day, we can look into contemporary empiric researchers, such as Mike Yoder and Lee Frost. As Mike Yoder (2014) states in his book "Behind the lens: When photos require a higher perspective":

> "There are three main reasons I seek a higher view. It can provide an angle and composition that eliminates distracting elements in the background. At a higher angle, you are more likely to be pointing your camera downward rather than straight out at a busy horizon line. Secondly, I've found that photographs of people looking up and into a camera are more pleasing than portraits taken from a lower perspective. Lastly, I like the higher position because it provides a perspective that people don't normally experience. It can make the photograph a little more distinctive and unique." (Yoder, 2014)[2].

By exploring wildlife photography, the recognized macro photographer Lee Frost sets a new perspective by not only capturing landscape but emphasizing the life inside it. He also empirically searched to change his viewpoint through highly grounded framing:

> "The vast majority of photographs are taken with the camera at eye level. Nothing wrong with that - it gives us a realistic view of the world. However, realistic doesn't necessarily mean exciting, and by intentionally shooting from alternative viewpoints, you can add a sense of surprise and drama to your landscape images. High viewpoints can work brilliantly, so instead of shooting that hill in front of you, why not walk up it and see what the view's like? If that seems too much like hard work, look for ways of elevating the camera position by a few feet rather than hundreds or thousands - it's surprising how the landscape opens up when you get a

[2] Yoder, M. (2014, February 16). *Behind the lens: When photos require a higher perspective*. LJWorld. Retrieved from https://www2.ljworld.com/news/2014/feb/16/behind-lens-when-photos-require-higher-perspective/

> little higher because you can see over features that normally block your view. Low viewpoints are interesting too. If you're shooting with a wide lens and you position your camera low to the ground, seemingly insignificant features loom large in the foreground." (Lee Frost, 2022: 61)[3].

Should the location be photographed with the habitual photographic point and the landscape with a different photographic point, above 1.6 metres? It's important to distinguish between drone photography focused to show the territory and creative drone photography designed to show textures and structures, shapes and colours. In the former, the presence of the horizon line is important or even indispensable for contextualising the frame. In the latter, the horizon line is rarely present.

3.4 PHOTOGRAPHING PLACE VS LANDSCAPE: A CONCEPTUAL MODEL.

For photography, drones represent a revolution and an intense entry into the new world. More than anything, it's about the dematerialisation of the photographer's body or, perhaps better, the conquest of a new dimension, less physical, more virtual. Legs and arms, hands and fingers, eyes and decisive experience, take on new proportions. The photographer no longer has to go, no longer has to walk, and has to search for the best frame. He sends his camera mounted on the drone. He no longer lives and occupies the space, he doesn't inhabit the place, and he gives up direct contact. You accept intermediaries who offer you excellent benefits in exchange for undeniable, but sometimes undervalued, losses. In short, the photographic equation has new criteria and new parameters.

To address these new challenges and parameters, and to integrate both analytical factors and sensory inputs, this study proposes a conceptual model (see figure 3.5) aggregating factors explored such as - the field of view, photographic points, sense, place and landscape.

The human viewpoint (approximately 1.6 meters above ground level) serves as a key reference for categorizing photographic points, allowing for a hierarchical classification of perspectives. This level, tied to everyday human perception, bridges the gap between place photography and landscape photography. Place photography captures a location from the inside,

[3] Cited in *BLACK+WHITE PHOTOGRAPHY*, Issue nº. 271, p. 61.

where different senses, beyond just sight, shape the framing and experience. Place photography shares characteristics with street photography, focusing on capturing the essence of a place through sensory engagement, as illustrated by quotes from photographers:

> "Street photography helps me understand the nature of my society and my place in it. I do it more for myself than for an external audience" (Turpin, 2019)[4]

> "If you can smell the street by looking at the photo, it's street photography". (Gilden, 2017)[5]

In this sense, place photography immerses the photographer in the space, allowing the interaction of multiple senses and a personal connection to the environment.

Landscape photography is characterized by a reliance solely on the sense of sight and is often framed from a distance, creating a separation between the viewer and the landscape. Historically, landscape photography has evolved from capturing pristine nature to reflecting social, economic, and political contexts. The chronological evolution of landscape photography: The pristine beauty of nature; the normality of humanized territory; the reflection of social, economic, and political views; This evolution aligns with different approaches - Candid vs. interventive photography and popular, authorial photography (Cosgrove, 1988).

Landscape photography thus becomes a field rich with diversity, influenced by context and classification, making it an inexhaustible subject for study and practice. Drone photography introduces a new dimension to both place and landscape photography, combining the sense of sight with cutting-edge technology. While the cultural background and photographer's intention remain influential, drones offer new perspectives—particularly through aerial views that blend place and landscape photography. By defining place photography as an immersive experience involving multiple senses, and landscape photography as a more detached, sight-based visual framing, we establish a clear conceptual model. This framework provides a new way to categorize and understand the artistic and technical choices in modern photography, particularly with the inclusion of new technologies such as drones.

[4] Turpin, N. (2019). *Street photography: Feel the force*. Medium. Retrieved from https://medium.com/@NickTurpin/street-photography-feel-the-force-339cabd6edbc
[5] Gilden, B. (2017). *Can you smell the street in a street photograph?* John Lewell Photography. Retrieved from https://johnlewellphotography.com/can-you-smell-the-street-in-a-street-photograph/

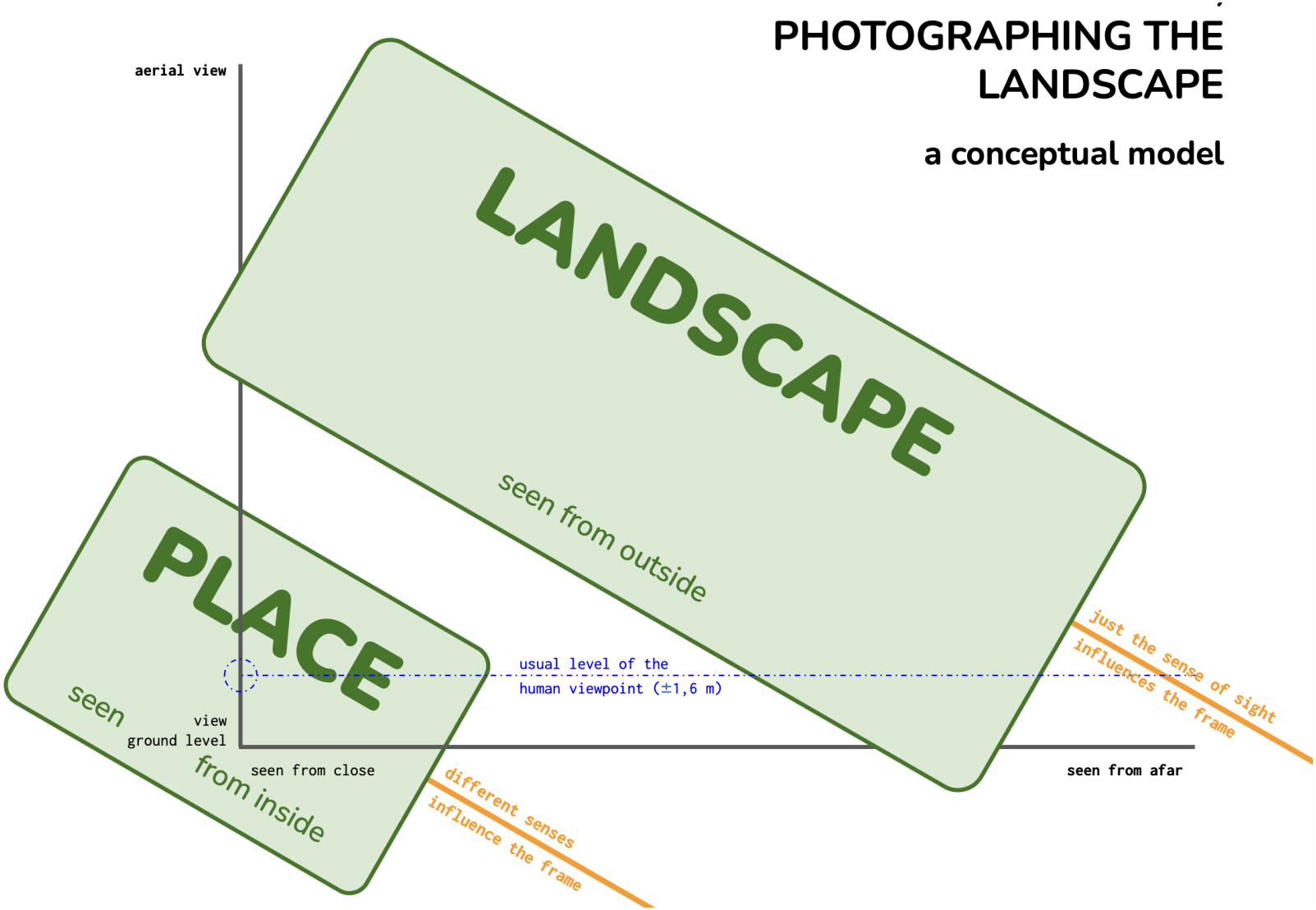

Figure 3.5: Photographing the landscape. A conceptual model

CHAPTER 4: LANDSCAPE PHOTOGRAPHY AS A SENSORY ANALYSIS TOOL

4.1 CASE STUDY AT ARMAÇÃO DE PÊRA, PORTUGAL

Seeking not only to provide a conceptual model of landscape photography and place photography, but the study also brings a practical exercise carried out in Armação de Pêra, in the municipality of Silves, Portugal (see figure 4.1). The region, located in the extreme south of Portugal, illustrates the tourism that takes place in the region, which supports the local economy. The study was conducted during the Algarve's summer period, between June and September 2024. The village is highly appreciated during this period, with a significant bathing season in motion, and it is in this context that the photographs were taken, making it possible to empirically analyse the differences in perspectives of the ground and sky.

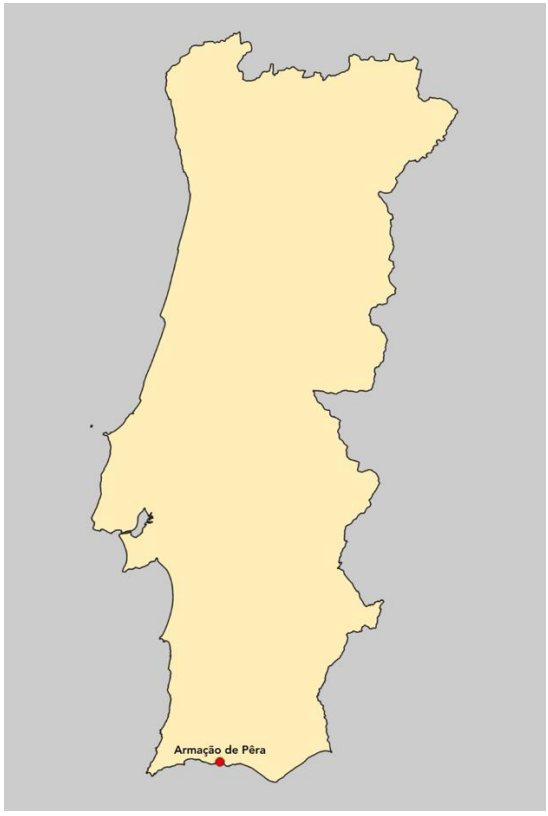

Figure 4.1: Location of Armação de Pêra, Silves, in Portugal.

4.2 METHODOLOGY

Using a DJI drone for aerial photography and a Sony Alpha a6500 camera for ground-level images. The following methodological steps were made:

i. Aerial Photography: Setup and Execution

In terms of equipment, were used a DJI Drone Model Mavic 3 Classic, with a 24mm equivalent focal length integrated camera for wide angle photos, and an absolute horizontal position (pitch 0°). The drone was kept stationary in terms of both X and Y coordinates and heading (angle to the North). All that was changed was the relative flight altitude, in other words, the drone's altitude above the sea.

For the flight procedure, the exercise has started just above the sea on Armação de Pêra beach, the initial shot was taken at 2.6 metres. Subsequent shots were taken in increments of 20 metres, progressing upwards. This variation allowed for a progressive change in perspective, from eye level to increasingly higher views. As the drone's camera remains horizontal, the left and right lateral limits of the frame don't change, but there are significant changes to the lower and upper limits.

ii. Ground-Level Photography: Setup and Execution

In the ground-level photographs, the Sony Alpha a6500 camera was used, paired with a Sony 28-70mm f/3.5-5.6 lens, at 30mm to approximate the focal “FoV” of the human eye. Due to the crop factor (1.5), this resulted in an effective focal length of 45mm, which offers minimal distortion and closely resembles human vision. Photos were taken in RAW format with a resolution of 6000×4000 (3x2 aspect ratio), to preserve maximum detail. The photographer aimed to avoid tilt in these ground-level shots, following a similar principle to the drone images, maintaining a level horizon. Importantly, these ground-level photographs were taken by the same person, a hobbyist landscape photographer, ensuring a consistent approach to framing and technique across the entire dataset.

Ground-level photos were taken while walking through the village, at specific locations of interest in Armação de Pêra (figure 4.2), chosen for their relevance to both local and tourist perceptions:

1. Estádio Municipal Armação de Pêra
2. Avenida Principal (N269-1) + 3 Rotundas
3. Parque Urbano + Skate Park Armação de Pêra

4. Hotel Holiday Inn Algarve
5. Jardim do Minigolf
6. Falésia da Praia

Figure 4.2: Ground-level photo positions.

The session was conducted on a Saturday morning during the peak of summer. This time was chosen to simulate typical tourist activity and capture the local environment as it is commonly experienced.

iii. Post-processing:

Minimal editing was done using Adobe Lightroom and Photoshop, focusing on adjustments using the Camera Raw tool, to ensure that the photos remained as true to the original capture as possible, However, as a conventional conversion from RAW to JPG, the images go from a 3:2 aspect ratio to 16:9.

4.3 RESULTS: AERIAL PHOTOGRAPHS

Firstly, the photographs taken with the drone are presented (figure 4.3), with a total of 15 photos in a range from 2.6 metres to 260 metres in altitude. The North and West positions remained the same throughout the exercise - 37º05'58.14‘N and 8º22'02.24’W.

Figure 4.3: A sequence of aerial photographs taken in Armação de Pêra, from an altitude of 2.6 metres to 260 metres.

Throughout the 15 images, it is possible to discern certain factors, and the change in the photographic point is notable. All the images taken by the drone fall within the second hierarchical level - different photographic point, above 1.6 metres and with a tilt equal to 0º. At 2.6 metres up to the third image, 20 metres, it can be seen that about half of the frame is covered by the sea, from 40 metres onwards this decreases, holding 1/3 of the image, until it disappears completely at 120 metres. Another important factor is that across the images three typographic scales appear in the landscape - the beach, urbanisation and the countryside - and this is possible because the framing changes until the horizon line appears in the 40 metre photograph.

Even though there is a coexistence between the beach, urbanisation and countryside, from 2.6 metres to 40 metres the predominant feature is the beach. From 60 metres to 160 metres, the predominance is the countryside, and in the following 180 metres to 260 metres, the countryside around the urbanisation stands out. The appearance of invisible elements is a surprise that is revealed gradually over the course of the altitude, and the contrast of the colours draws attention and highlights the main differences in the territory, being able to delimit each of the zones.

The territory's nuances are not the highlight, and the images emphasise what is shown in general. However, by using images of a larger scale and resolution (Annex I), it is possible to recognise the existence of imposing and striking elements captured by the drone, such as the Armação de Pêra Municipal Stadium and the Holiday Inn Algarve Hotel. However, due to the height of the buildings along the urbanisation, many elements remain hidden and are visually blended in by the muted-coloured blocks.

The characteristics of the terrain are also visible, firstly in the frames where the horizon line can be seen - between 40 metres and 260 metres - the plainness of the topography, as well as some areas that show the discontinuity of the urban mesh, with houses or groups of buildings isolated from the main urbanisation. Even though the terrain in general is relatively flat, the cliffs at the foot of the beach become more significant as the altitude increases, and you can even see the internal paths taken by pedestrians and the excessive vegetation that is scattered at the top.

As the tilt is at 0º, after 60 metres, where the buildings no longer cover the horizon line, half the framing is inevitably taken up by the slightly cloudy sky, painting the visual picture

with a striking blue, and in the background it is increasingly darker due to the shadows cast by the clouds present that day.

4.4 RESULTS: GROUND LEVEL PHOTOGRAPHS

For the photographs taken on the ground, a path was traced in order to highlight the popular places in Armação de Pêra, with a final selection of eleven photographs. Unlike the aerial photographs, the exercise had a great variation horizontally, but little vertical mobility. Only by finding higher points in the places where the photos were taken, as well as the particular vision and prior knowledge of the amateur photographer who took them.

The street photographs, in general, showed a more immersive experience in the scene from the moment they were taken, and the senses were used extensively, compared to drones where sight was the only possible sense. In this way, the movement of people through the environment not only made the photographs more vivid, but also made them more spontaneous, and if the photos had been taken seconds later, the results might have been different.

Unlike the images provided by the drone, here the skyline doesn't appear in most cases, giving the feeling of a more enclosed and less empty space. The textures, shapes and interchanges are seen in a much more detailed and concise way than people are used to seeing in their daily lives, both tourists and locals.

Starting with photographs "a" (figure 4.4) and "b" (figure 4.5) - Armação de Pêra's Municipal Stadium - you can see that the grandiosity of the place goes beyond the framing done. Since photograph "a" was taken outside the stadium, the frame is taken up by the white exterior walls and the two lampposts, as well as the cars parked for a match between the local team and the visitors - Sporting Clube Farense Juvenil.

Figure 4.4 (a): Outside the Armação de Pêra Municipal Stadium.

The second provides a complementary context to what is happening outside. You can see the green turf, the children warming up before the official match, and in the background, there is a subtle reflection of what's going on around the stadium, with the Mediterranean vegetation, which is better seen in the aerial images taken. Another important detail is that this photograph was taken on top of the stadium grandstands and was the only one with a tilt of more than 0º.

Figure 4.5 (b): Inside the Armação de Pêra Municipal Stadium.

Moving on to the second approach, the photos were taken at the three roundabouts framed by the aerial photographs on the main avenue. Photograph “c” (figure 4.6) is the roundabout furthest to the west, “d” (figure 4.7) to the centre and “e” (figure 4.8) to the east.

Figure 4.6 (c): First roundabout.

In the first roundabout, you can see the artistic presence that can't be seen in the aerial photos, as well as a politically biased poster and the works that are taking place along the urbanisation.

In the second roundabout, the appearance is not clean or traditionally artistic, but the central object is less well cared for and has graffiti, as well as elements that are supposed to be water to compose it. Similarly, in the background, there are local shops, grocery shops, cafés and road signs, the latter near the beach.

The picture seems more closed than the others because, due to the presence of the buildings, it is not possible to see the sky or the skylines, giving it a more urbanised look than the others.

Figure 4.7 (d): Second roundabout.

The third roundabout returns to an artistic centrepiece, with a more tropical feel and more empty spaces due to the blue sky.

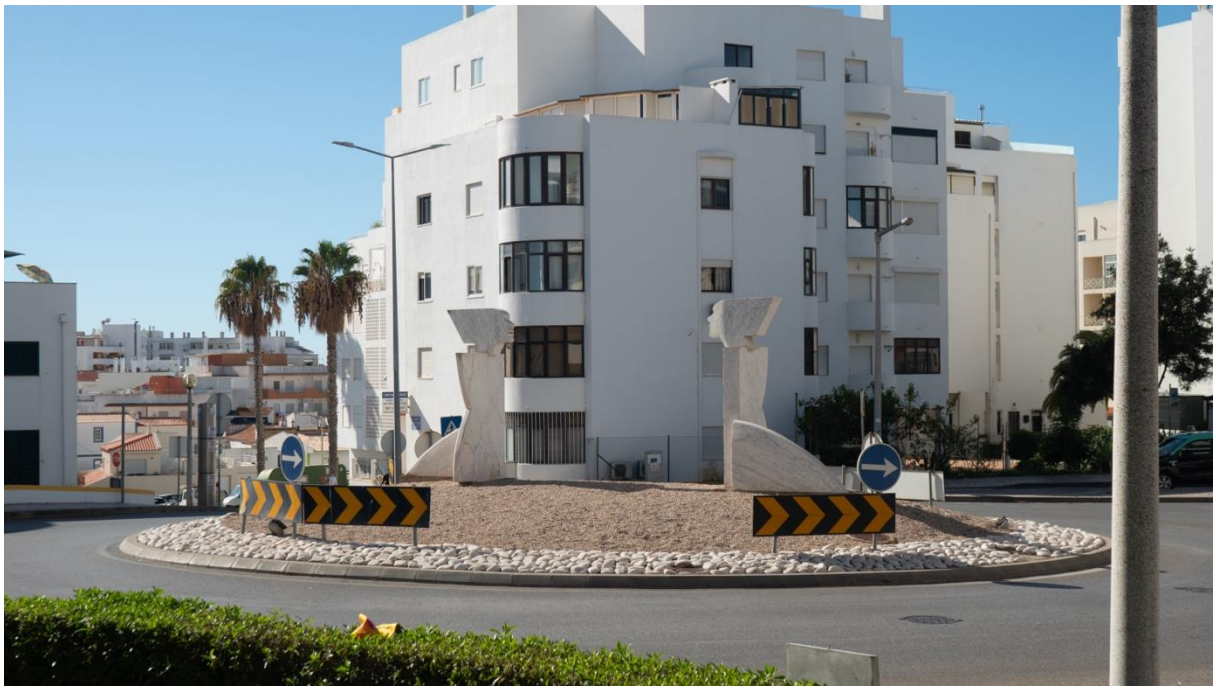

Figure 4.8 (e): Third roundabout.

The spaces of the urban park and the skate park are shown in photographs "f" and "g" (figure 4.9 and 4.10). The small urban park was not being used at the time, but the exuberant colours of the toys contrast with the sober colours of the buildings, as does the surrounding

vegetation. In contrast, the skate park is characterised by the presence of tree vegetation and a more open space.

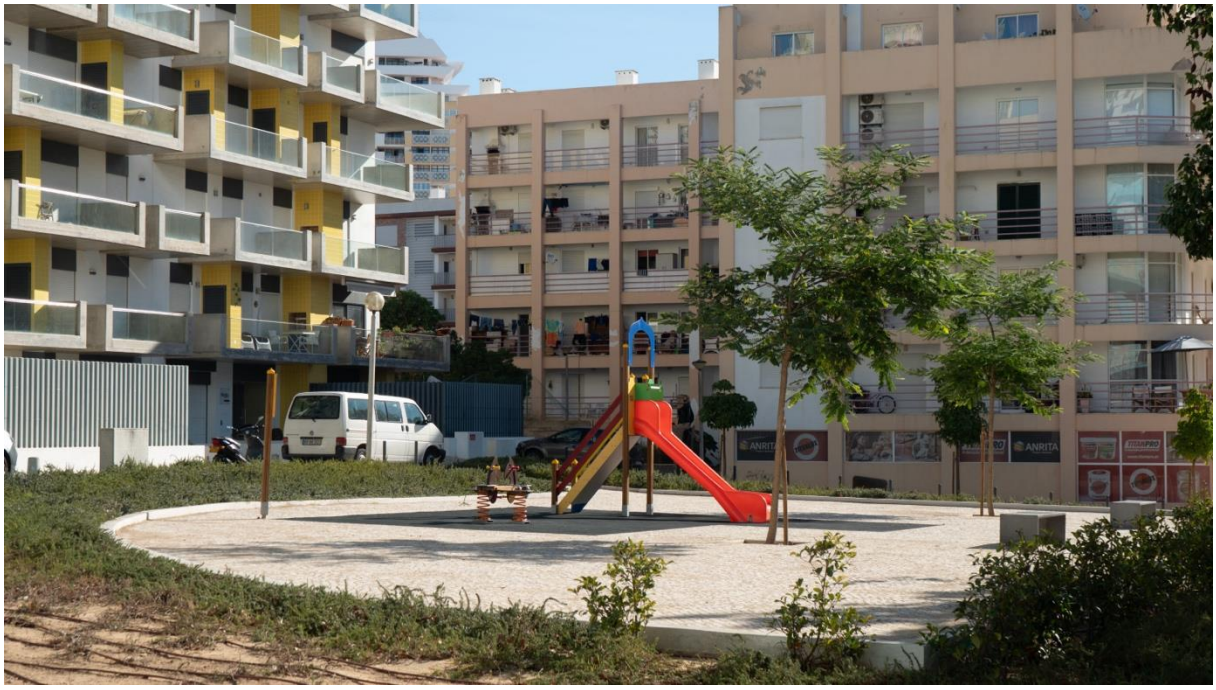

Figure 4.9 & 4.10 (f and g): Urban park and skate park in Armação de Pêra.

Turning now to the beachfront area, we have image "h" (figure 4.11) of the Holiday Inn Algarve Hotel, which at the time was undergoing maintenance, but is not at its peak, taking up almost the entire final frame.

Figure 4.11 (h): Holiday Inn Algarve hotel on the beachfront.

In contrast, photograph "i" (figure 4.12), which frames the "Jardim do Minigolf", shows an open space with palm trees and elderly people strolling on an ordinary day. The most interesting aspect of the shot is the contrast between the land and the sea, which divides the image into two uniform quadrants.

Likewise, the presence of the unevenness is remarkable, demonstrating more specifically the passage from the urbanised area to the beach itself via the ramp visible on the far right-hand side of the image. The design of the railings, the architect's use of materials and the sculptures become visible with the proximity of the ground photograph.

In the last two shots, it was decided to show the view from inside the cliff while standing on it, where the contrast between its interior and the buildings is shown in photo "j" (figure 4.13) and finally, in a shot “k” from the highest point (figure 4.14) of the cliff so that it was possible to visualise, like a viewpoint, the beach and its surroundings on a typical bathing day, demonstrating the strength of the Algarve summer in a single image, as well as the striking presence of the horizon line, which even with a photograph with a longer focal lens, continues to demonstrate the grandeur of local nature.

Figure 4.12 (i): Minigolf garden.

Figure 4.13 (j): Cliff.

Figure 4.14 (k): Beach seen from the highest point of the cliff.

CHAPTER 5: DISCUSSION & CONCLUSIONS

5.1. DISCUSSION

To answer the central question of this study - How are the new challenges for territory and landscape photography perceived across cultures in the drone era? - the elaboration of the exercise was fundamental to perceive the nuances of reality, being inserted in a lively and touristic region, to express not only an analytical perspective in testing the analytical part of the conceptual framework, but also the holistic and sensory aspects provided throughout the empirical experience.

To this end, the general objective of the study was to validate the conceptual model that integrates the new challenges provided by the age of drones, outlining the perceptible differences in the framing of landscape photography and place photography, the latter of which integrates the similar values of street photography and supports enrichment not only visually, but more closely, with cultural, social and religious values.

In this regard, some points are valid as part of a general discussion on the subject. For example, in general, one of the first perceptible factors is the feasible photographic points, in which a distinction is made between photographs taken to show the territory and creative photography, aimed at textures and structures, shapes and colours, both for drones and photographs taken on the ground. For the more analytical aerial photographs, the importance of the horizon line is reaffirmed, as it is indispensable for contextualising the frame.

Ground-based images allow for a more detailed perception of textures, highlighting aspects such as the type of soil, vegetation and building materials, due to the proximity of the camera to the objects being photographed. As discussed by Cosgrove (1998), landscape representation is intrinsically linked to physical proximity and a direct relationship with the environment, which makes it easier to capture minute details in ground-based images.

On the other hand, aerial images provide a broader view, but often result in a loss of textural detail. However, they highlight patterns and shapes that are less noticeable at ground level. According to Liebmann (2008), aerial views provide an “abstract approach” to the landscape, emphasising structure and spatial organisation, but sacrificing details such as the texture of individual elements. This means that textures on the ground are diluted into homogeneous

surfaces when viewed from above, which is offset by the ability to visualise the interconnections and general morphology of the territory.

In ground-based photographs, texture is often captured more clearly due to the camera's proximity to the elements, allowing for a more detailed analysis of surfaces such as cliffs, undergrowth or even paved streets. Finer textures, such as the graininess of the sand or the roughness of the stones, become visible and form an essential part of the visual narrative of these photographs, and perception is not only achieved at the level of sight, but felt in the senses as we walk along the established route, better perceiving the environment beyond technology or a device.

In contrast, in aerial images, texture loses prominence in favour of a more global view. Even so, by adjusting the flight height, it is possible to capture textural nuances in patterns such as the movement of water on beaches or the undulations of agricultural land, as described by Bock (2020), who explores the idea of visual framing as a tool that determines the way we perceive landscapes, whether on a micro or macro scale. However, as the tilt was performed at 0º, the exercise becomes centred on the horizon line.

With place photos, you can feel the environment around but can't see the overall context. With a landscape photo, however, what you can be seen is the whole landscape. For example, if someone is shown a photo of a street in Paris and then you show them a photo of a landscape of Paris, it will be easier to analyse the location from a broader view of the territory. The only thing that could identify the region would be the local culture itself expressed physically through a striking monument, but it could still be mistaken for a similar locality. As is the case with the Eiffel Tower, which is the visual landmark of Paris, but could easily be compared with the construction of Tianducheng in 2007, which features a replica of the Eiffel Tower and Paris (Scovazzi, 2014).

This changes when the viewer has a connection with the place, since place, as Jeff Malpas argues, “is not just a physical location, but a lived and experienced space, imbued with meanings that transcend its mere physicality” (Malpas, 1999: 35). The relationship that the individual establishes with the place can transform the perception of the environment, bringing new layers of meaning and personal connection. In the same way, the images taken by the exercise could be easily identified by locals, but if they were presented to tourists or foreigners,

it would probably be difficult to accurately express the context in which they are inserted, since the connection is deeply personal.

In addition to the general concept, expressed and tested, the study defined the following specific objectives:

I. To examine how culture influences landscape and place

As analysed throughout this thesis, street and place photography are highly influenced by the contexts in which they are inserted. Nick Turpin emphasises that street photography helps photographers understand their own society and the place they occupy in it, suggesting that the act of photographing transcends the merely visual to become a cultural and personal exploration. As Bruce Gilden describes, if you can smell the street when you look at the photo, it's a street photograph. This further emphasises the cultural immersion that the images evoke, offering a direct passage into the daily life of a locality. Culture, with its social dynamics, symbolism and movements, is captured by the lens in a special way.

Cultural interpretations shape what is seen and how the territory is seen, bringing to light a unique time period, as is the case with the photograph by the Czech Josef Koudelka (see figure x), where a photograph of the place evidences a period in history, such as his trip while participating in the photographic mission of the Interministerial Delegation for Regional Planning and Development (DATAR), bringing to light issues linked to land use, the impact of industrialisation, or the way in which space is appropriated by different societies over time.

In the context of the emergence of new technologies such as cameras and drones, contemporary landscape photography has come to incorporate not only what is visual, but also the issue of spatialisation. As a result, the conceptual model is inserted both analytically and holistically as a way of catering for this space. In this case, culture influences not only what is photographed, but also the way in which these images are captured, since the use of technology allows for new perspectives and approaches. Landscape photography has transformed from a purely aesthetic medium to a vehicle for cultural communication, reflecting ideologies, environmental conditions and the way societies interact with the territory.

The use of drones expands this vision, allowing new, more comprehensive views of the territory and its dynamics. However, one reality that is noticeable throughout the exercise is that altitude influences the perception of what is being seen, with culture being perceived

through greater insertion at a personal level in the framing. While aerial photographs provide a complete and panoramic territorial view, they tend to distance the observer from the immediate sensory and emotional experience of the place. In contrast, ground-level photographs, taken to simulate proximity to the focal area of the human field of vision, allow for a more intimate and holistic connection with the environment, favouring the capture of cultural elements and details that are often lost in aerial images.

II. To analytically conceptualise, through a theoretical diagram, the spatialisation of place and landscape, based on ground-level and drone photography

Inserted into the analytical part of the thesis, the conceptual model spatialises the applicability of this perspective, bringing up, both directly and indirectly, analysis of the human field of vision, photographic points, images seen from near and far, and finally, the definitions of place and landscape being inserted into the contemporary era of UAVs. Firstly, theoretically, the concepts are well grounded in the studies of important names in landscape representation such as Jeff Malpas and Denis Cosgrove, who define landscape as a way of seeing that involves a visual representation of the environment, where place is experienced, while landscape is mediated by territoriality (Malpas, 1999; Cosgrove, 1984).

Through the conceptual model, one can also understand why certain choices are made by photographers like Adams, who prefer a higher photographic point than the human viewpoint of 1.6 metres. This highlights the duality in landscape representation, demonstrating common and distinct zones in the spatialisation of place and landscape (Adams, 1971).

The concept demonstrates that ground-level photography, taken from the human perspective, captures the immediate experience of place, reproducing the way we see the world around us. This form of spatialisation reflects our bodily perception, including proportions and natural spatial relationships between objects. Here, the focus is on specific elements of the place that create an emotional or cultural connection with the beholder.

In the same way, the diagram demonstrates how technology can influence the way images are captured, whether it's a camera lens on the ground or a drone's sensor that also impacts the result. The axes of the diagram quantitatively expose subjectively holistic aspects such as emotional connection, interactivity with space and scale.

III. To conduct a case study that validates the established diagram.

According to the case study conducted, the central aspects discussed in the conceptual model can be clearly seen. Where we see the concepts of place and landscape appearing with their particularities in aerial photographs and on the ground. This becomes evident even if we only analyse aerial images, with the lower altitude images - from 2.6 metres to 40 metres - hiding the skyline with the buildings of the urbanisation, making it difficult to perceive the landscape, but only a portion of the beach and relative surrounding urbanisation. This scenario changes as the exercise continues - from 40 metres to 260 metres - where we find fewer details and textures exposed, but a broader view of what is happening in Armação de Pêra.

Likewise, being on site made it even clearer what the senses do in both situations. In aerial landscape photographs, the only sensory contact is sight, as it's not possible to be there with the camera. On the other hand, photographs of the location carry with them the immersive charge experienced on the day.

Photographs taken on the ground, at eye level, also represent the idea of spatiality and the importance of depth. In other words, the more the space was opened up, in general, perception also increased, as did higher altitudes. The example of a photograph that demonstrates the model is the ground photograph “k” (figure 4.14), which was taken at a higher point and which reveals in altitude the greatness of the context of the photographs, making the theory that place and landscape are influenced on the X axis by images seen up close and also seen from afar a reality.

The exercise in Armação de Pêra demonstrates the importance of a range of varieties when it comes to representing the landscape. Therefore, creativity and analytical perspective must go hand in hand to encompass the most varied facets of the landscape.

As pointed out by Anne C. Godfrey, a landscape architect must use the tools at their disposal, taking advantage of contemporary technology not only to offer a saleable representation of space, but also to express the personal and collective values that are manifested in the daily life of the locality (Godfrey, 2020). This balance between technological innovation and cultural and social sensitivity allows for a richer and more complex reading of

the environment, reflecting both the functional aspects and the emotional narratives that the space can carry.

5.2 CONCLUSIONS

The study aimed to assess the new challenges for territory and landscape photography, which are influenced by the cultures in which they are inserted, at a time when there is a drastic evolution in technology, with the exploitation of the altitude factor through drones. Within this context, after looking at different cultural visions and definitions of landscape and place, the study conceptualises and tests the model through an exercise in Armação de Pêra, in the county of Silves, Portugal. With this, the study concludes that the terms cited and the diagram become real and qualitative over the course of the results presented, given that the views taken at ground level are associated with place and with the addition of altitude, the territorial representation evidences the territory itself. In addition, the results point to the importance of cultural, social and religious perception in relation to landscape representation, with images demonstrating more than meets the eye.

5.2.1 Theoretical and practical implications

The theoretical implications of this work revolve around a re-conceptualisation of landscape and place from an interdisciplinary and technological perspective, taking new perspectives that explore alternative approaches to the traditional ones. The use of aerial photography with drones and photographs at site level within landscape representation provide new ways of interpreting the landscape through a cultural vision. Thus, by analysing the impact of multiple photographic points, framing and different scales, whether in a pedestrian or bird's eye view, the study lifts the traditional boundaries drawn in a pre-UAV era on landscape and place, suggesting a more fluid interrelationship. This represents a significant advance, as it allows us to first identify the challenges and then develop appropriate solutions, such as altitude integration in this case.

Furthermore, based on the assumption of concepts previously established and studied by geographer Denis Cosgrove and more recently by philosopher Jeff Malpas, spatialisation theories are expanded by incorporating new representation technologies, which can contribute to a more complete, complex and interconnected vision, but above all, a more human one.

The practical implications of this work are the results obtained, which allow for interdisciplinary use. It does not serve as an end, but rather to new horizons within the subject. It can be explored by geographers, anthropologists, architects, landscape architects, biologists, landscape ecologists, and others to overcome cultural barriers and provide a new vision, even within a globalised world. Expressing local and community individualities creatively, resulting in better choices for framing and identification, causing a greater sense of belonging to the place. Helping to make places less superficial and more in keeping with lived reality.

In addition to the practical interdisciplinary benefit, the model could be explored within the academic sphere, bringing new exercises from different parts of the world and being added to curricular units, along with the addition of new technologies, as is the case at the University of Algarve - FCT, in the Master's programme in Landscape Architecture, which adds the subject "Photography and Landscape Representation" to its unit and is already trying to insert the concepts described throughout this thesis. Based on the curricular unit described, annex II suggests a prototype Curricular Unit that encompasses the concepts and practices described.

5.2.2 Limitations and future lines of research

The study has certain limitations, and the initial idea would be to incorporate a larger component of data collection and results, with distributed forms to better classify the perception of place and landscape within landscape representations. The thesis would also include more than one case study in different locations - São Paulo, Brazil and Penha Garcia, Portugal - to demonstrate greater applicability of the conceptual map.

For future studies on this subject, it is important to examine in detail the expectations and data analysis of the images obtained, as well as a more in-depth study of how the diagram behaves in other locations, so that it can be called standards for all cases. It is also recommended that comparative studies be carried out between the data obtained in this document and traditional European schools that demonstrate other facets of the cultural landscape.

Overall, the study aimed to understand the current challenges posed by new technologies for landscape representation. In addition, it proposes analytical, conceptual and practical resolutions, believing that the main and specific objectives have been achieved and the

conclusions provided here can serve as a starting point for new discoveries. Despite the immense potential for landscape representation, the subject is open to new resolutions, and studies are needed to address other challenges posed by the age of drones that have not yet been explored. The study carried out helps managers and academics to better understand contemporaneity intertwined with cultural, social and religious aspects, as well as analysing the territory.

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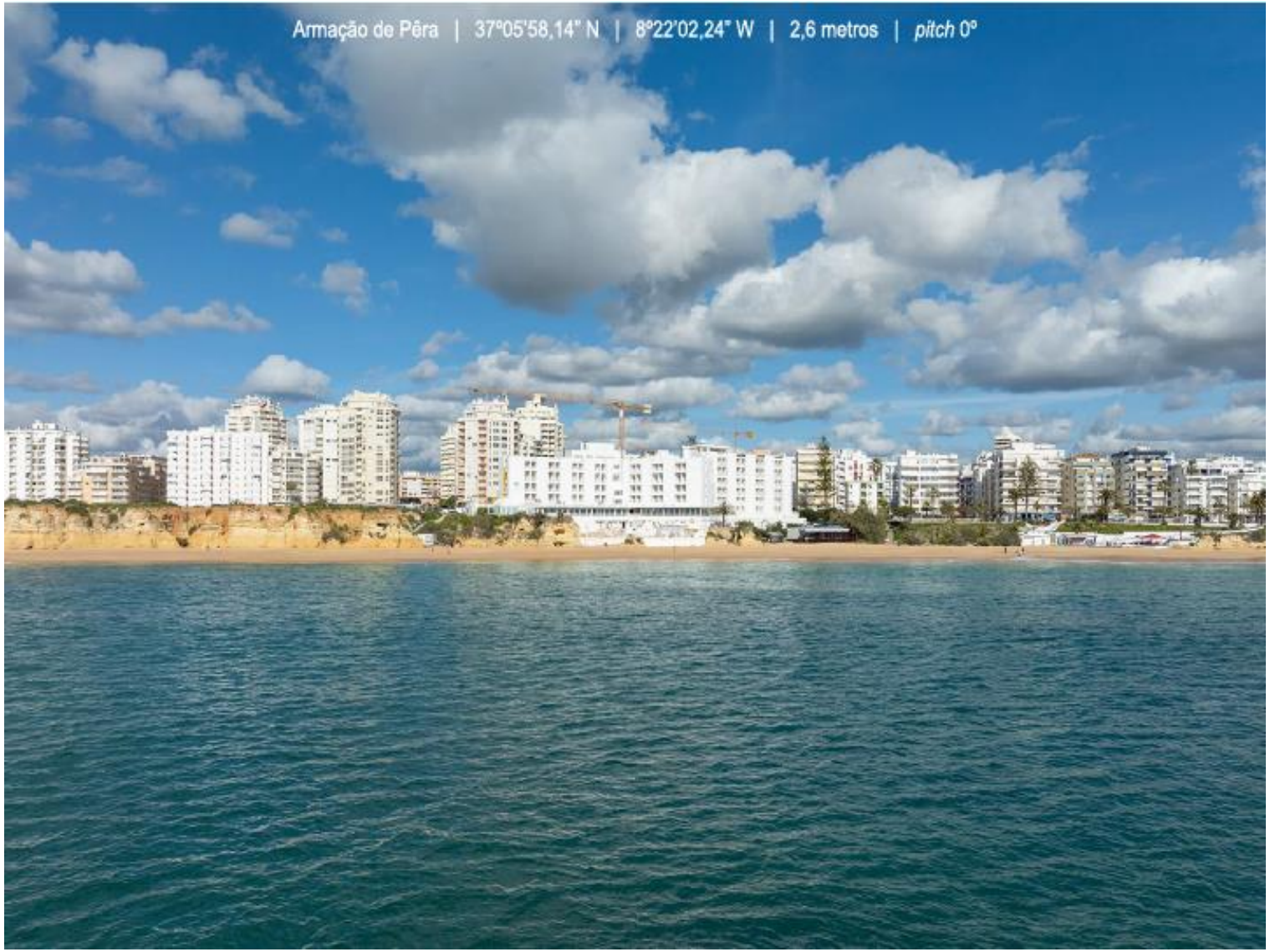
ANNEX I: ENLARGED AERIAL IMAGES



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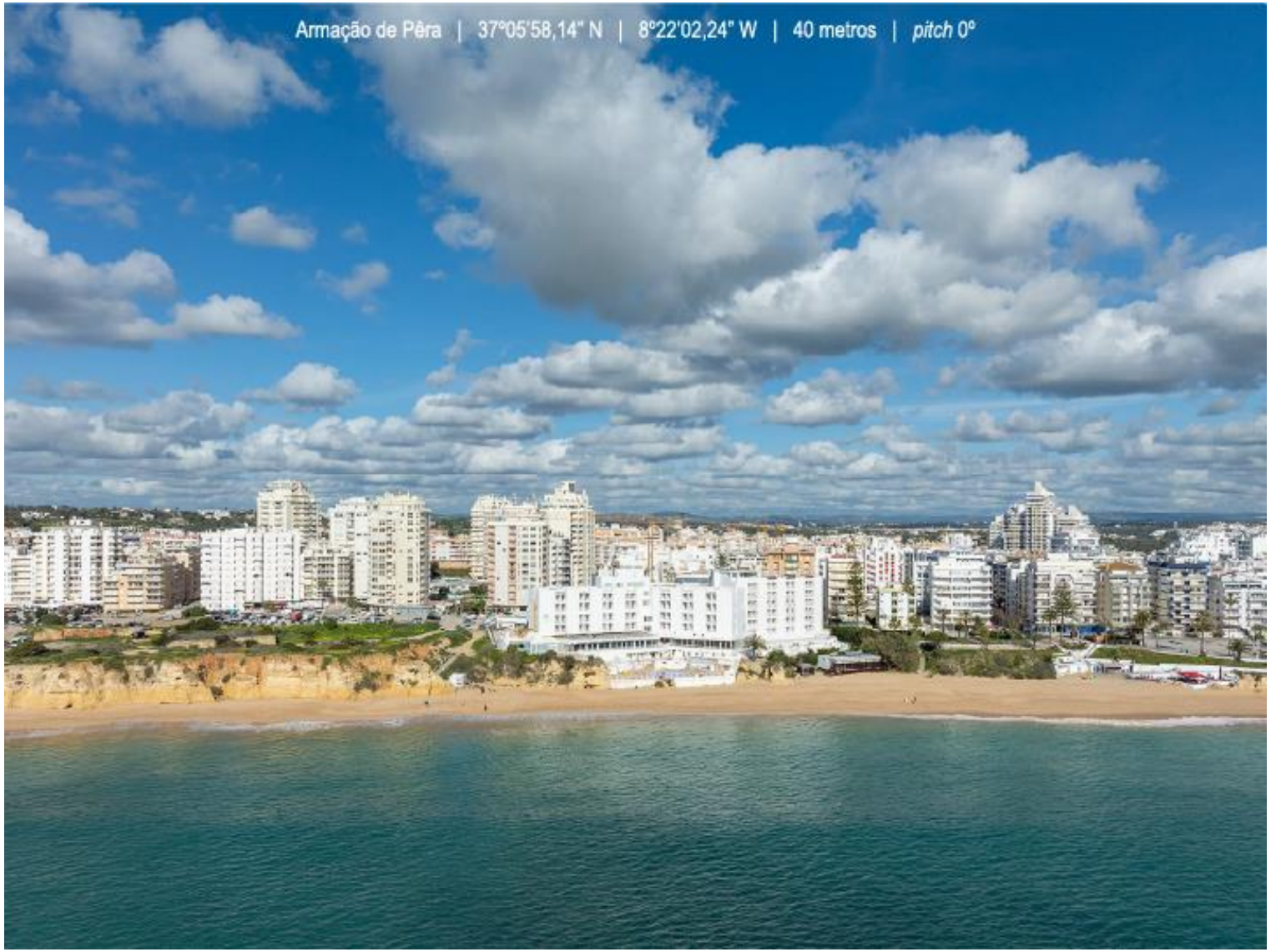

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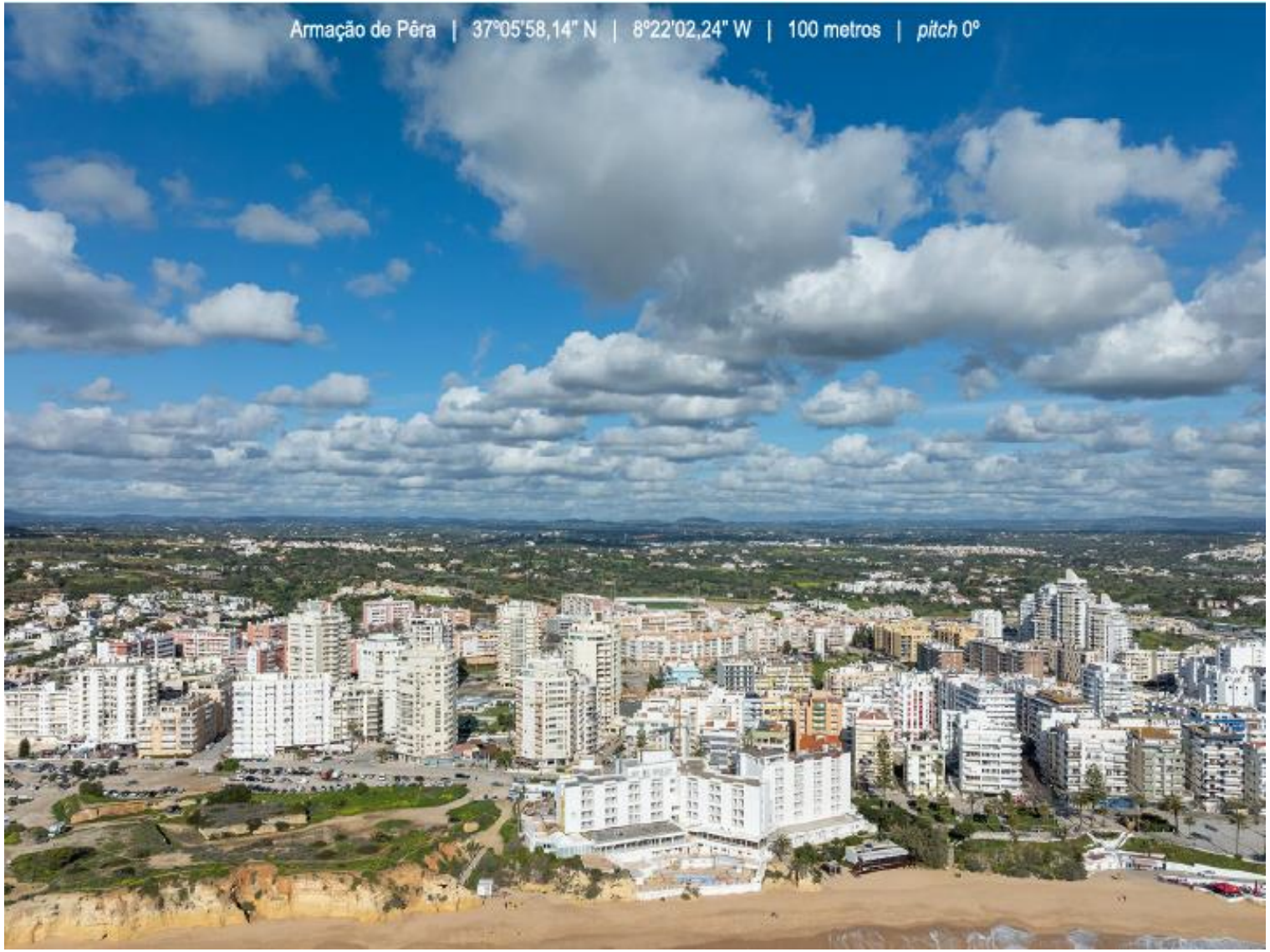

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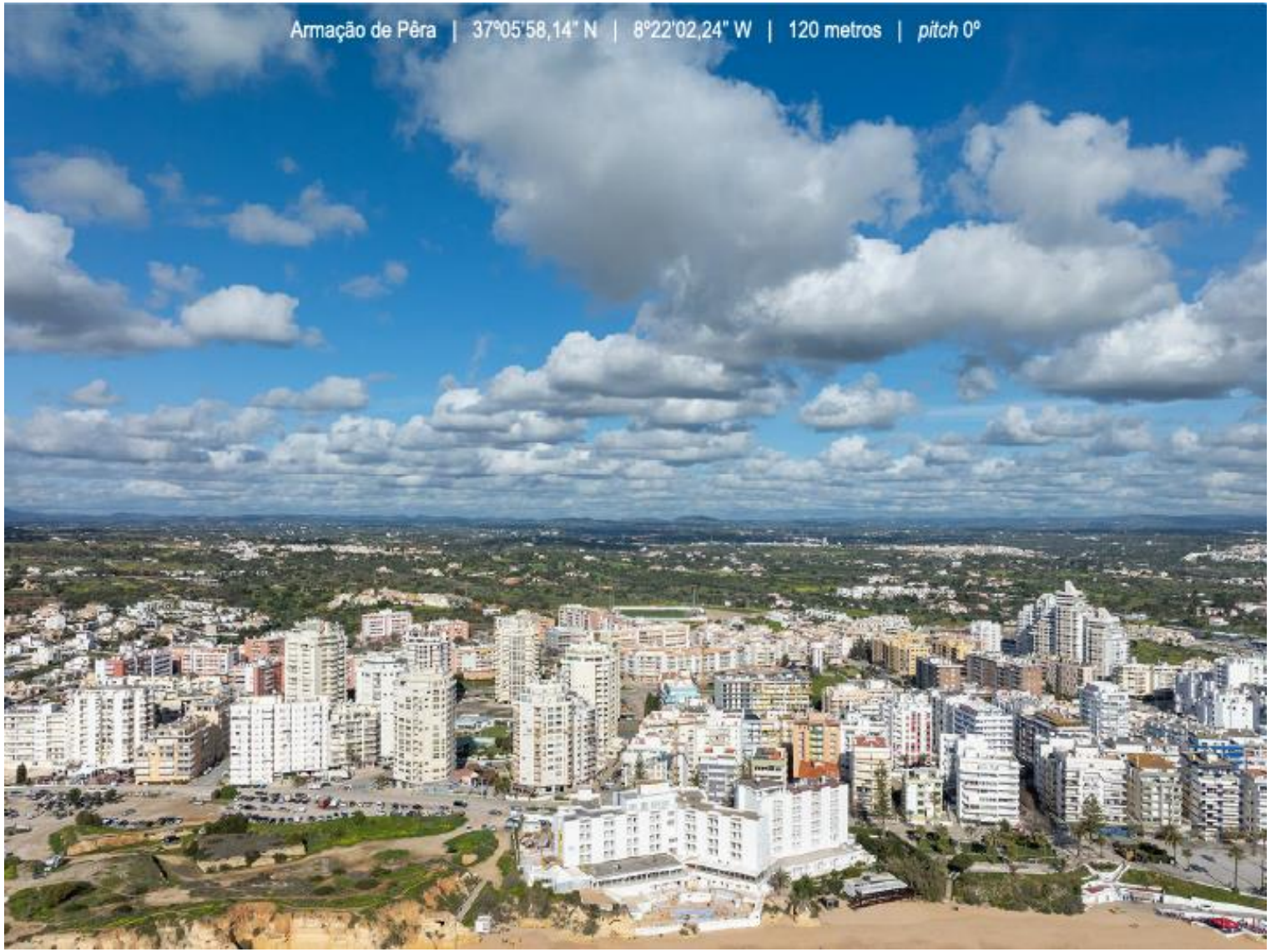

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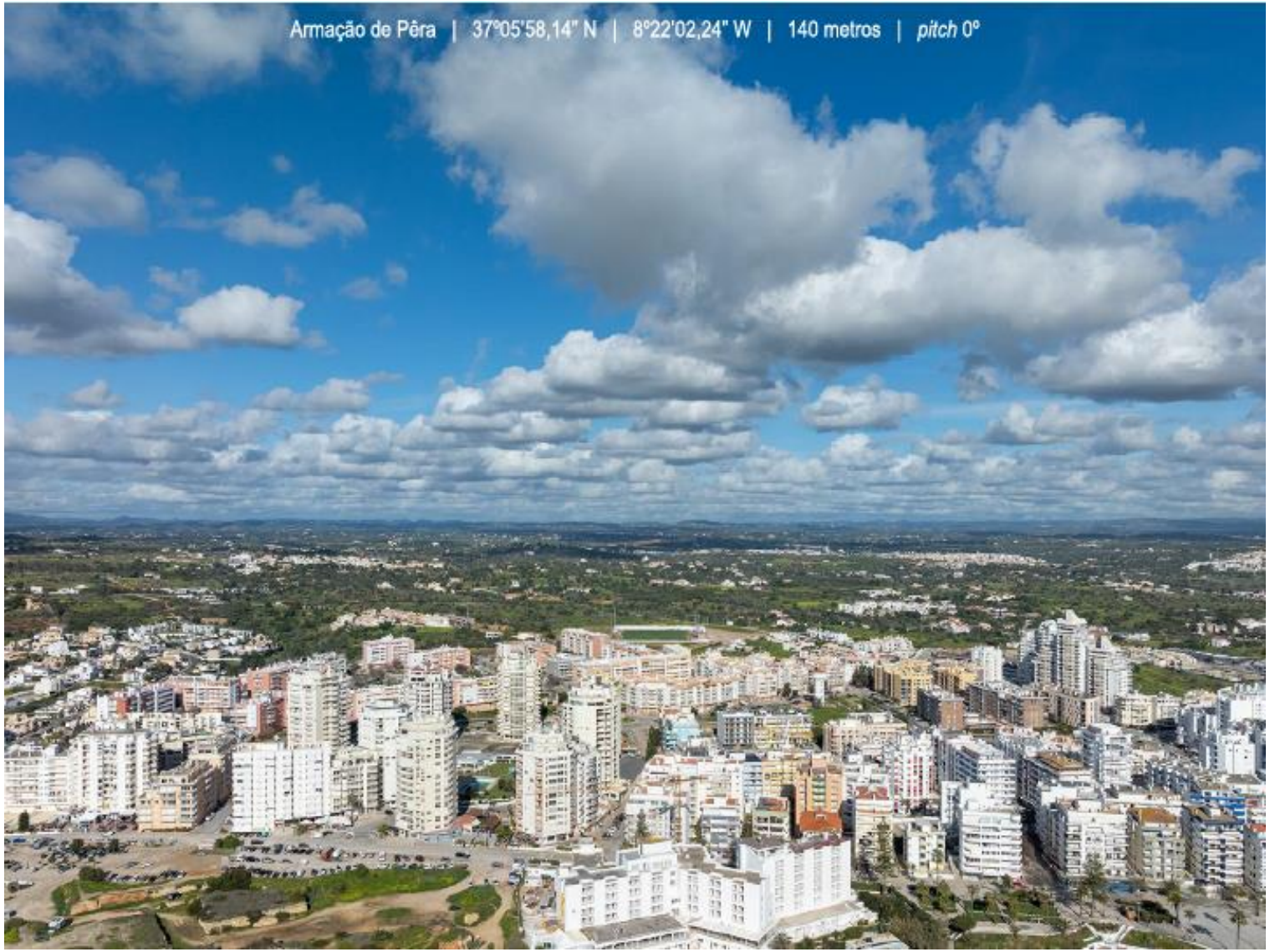

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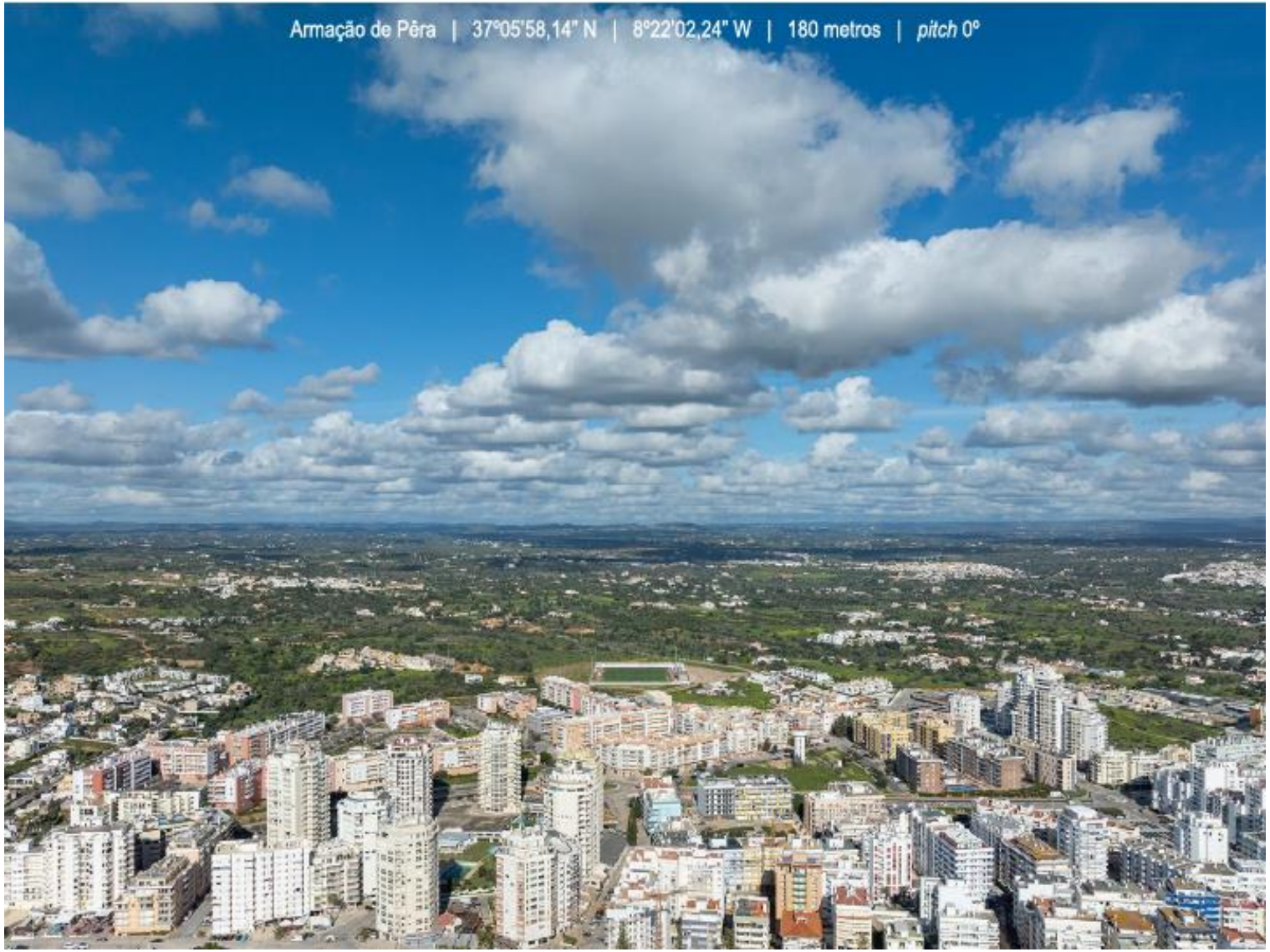

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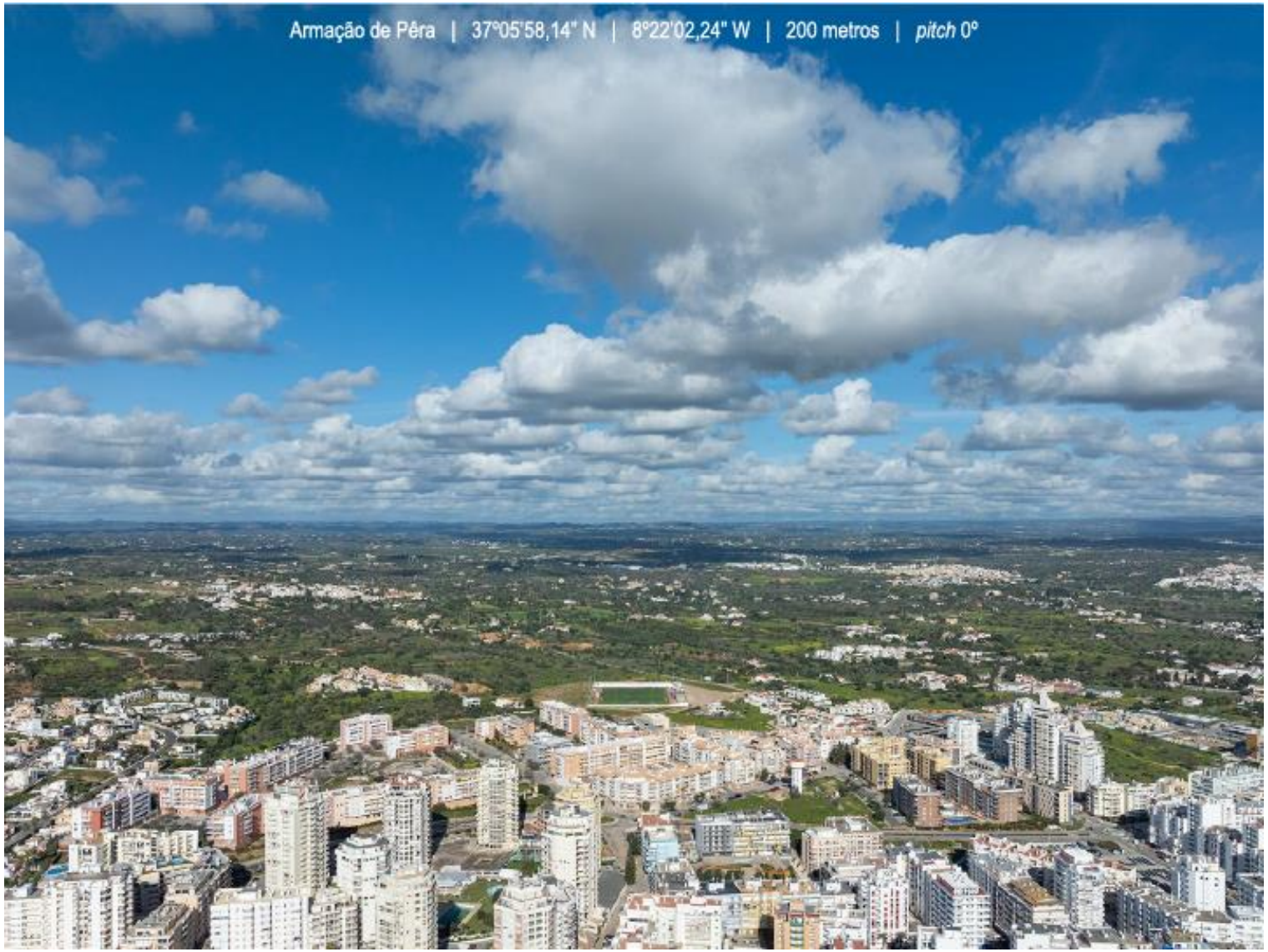

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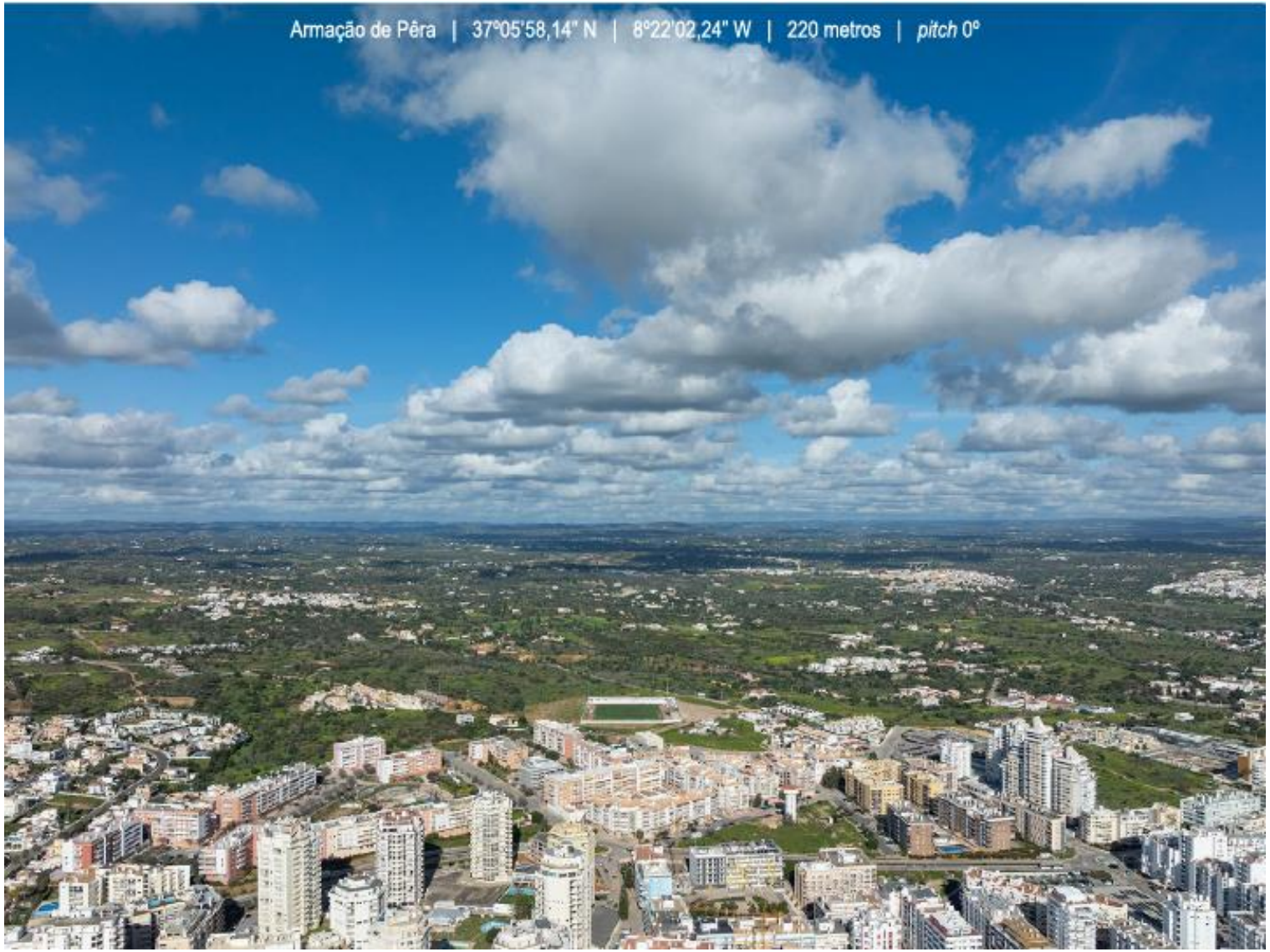

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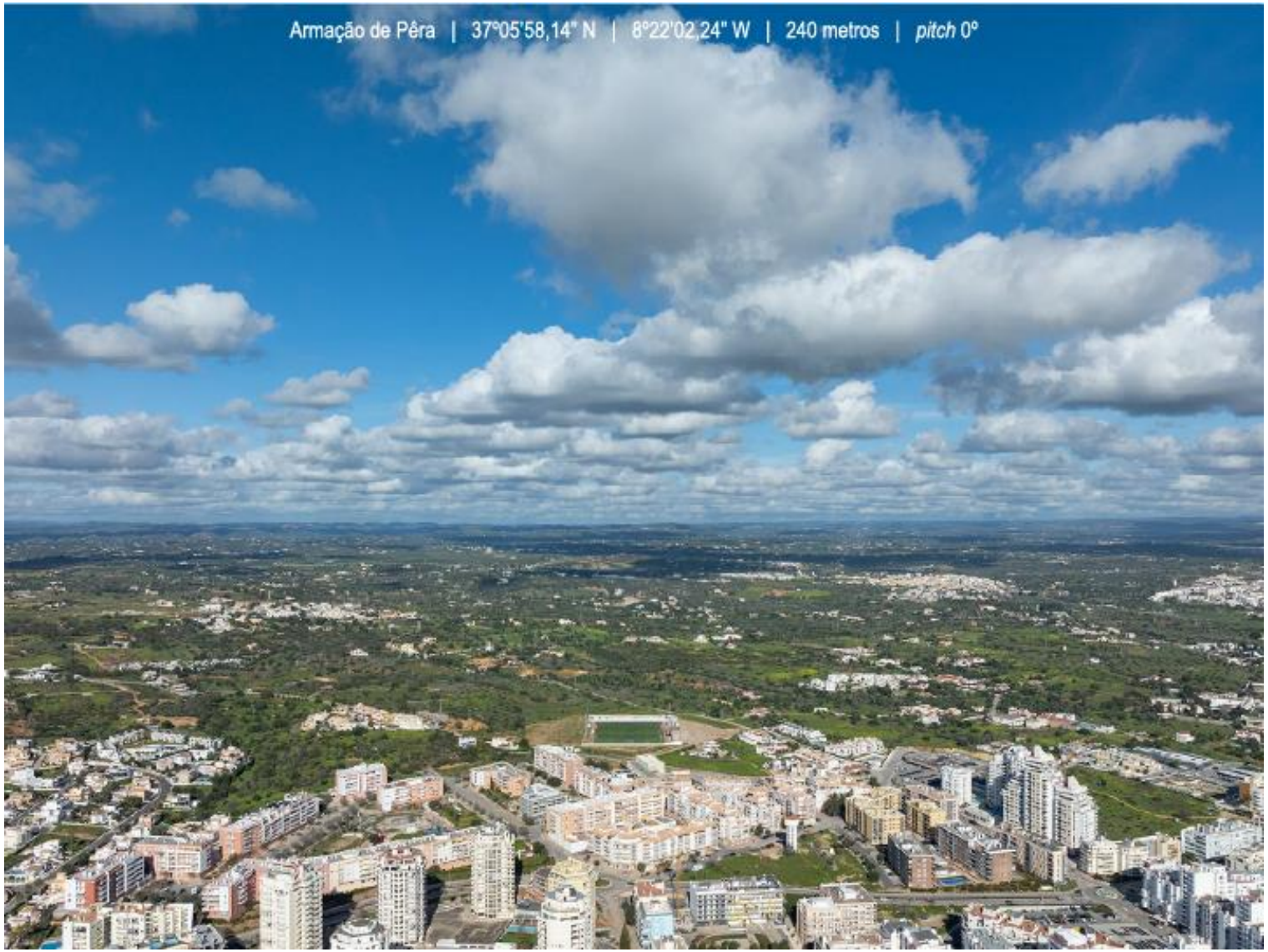

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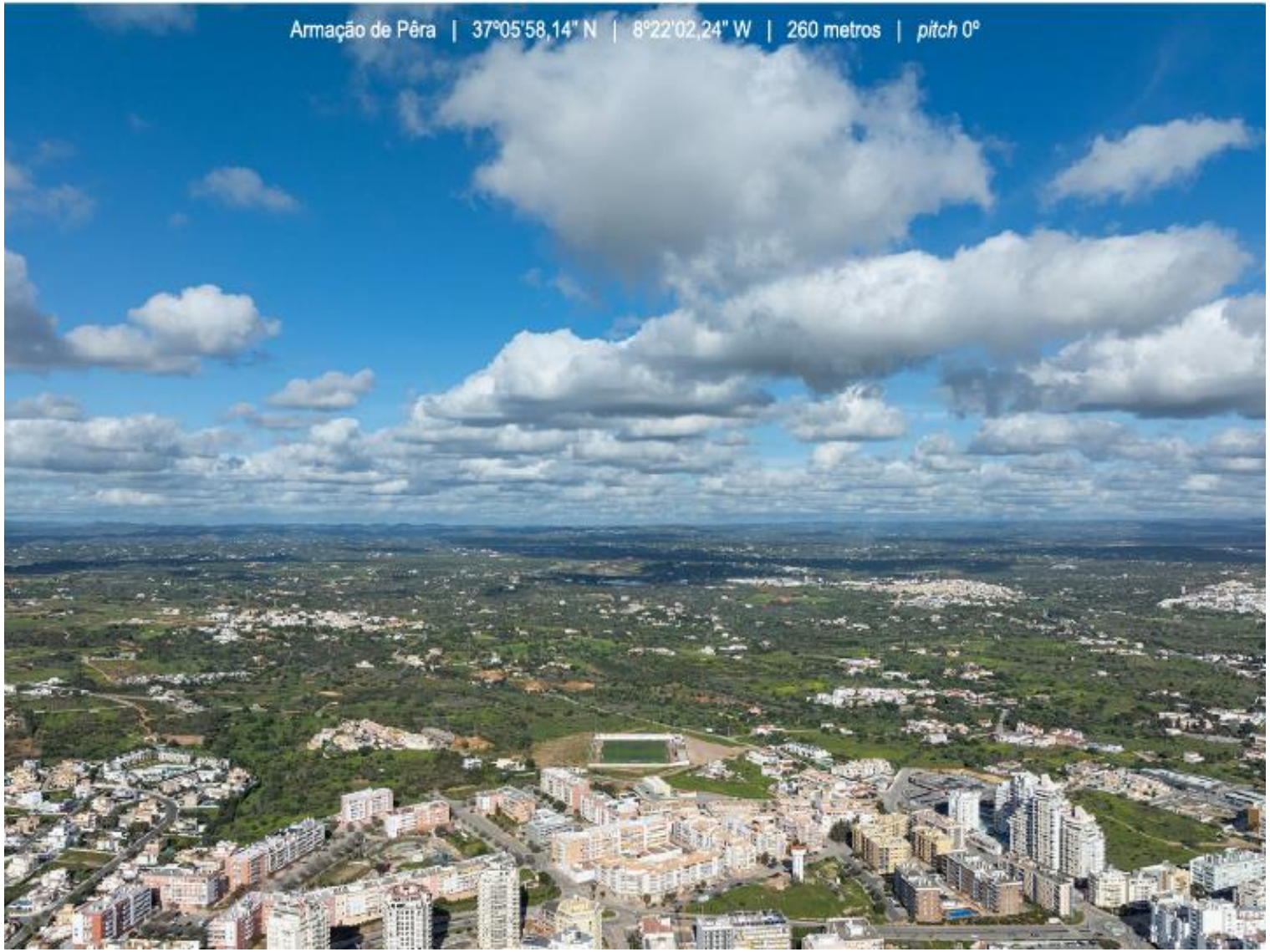

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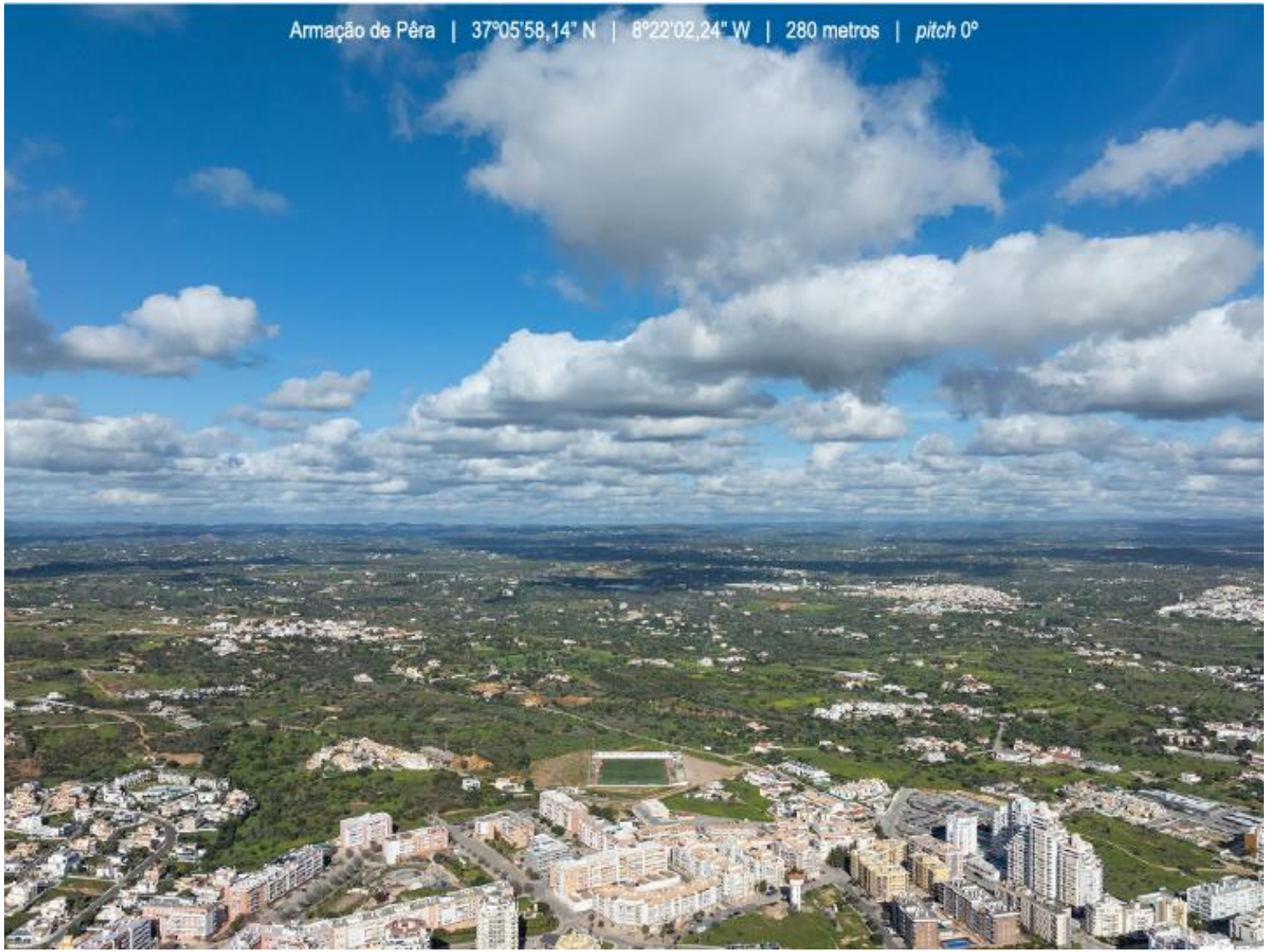

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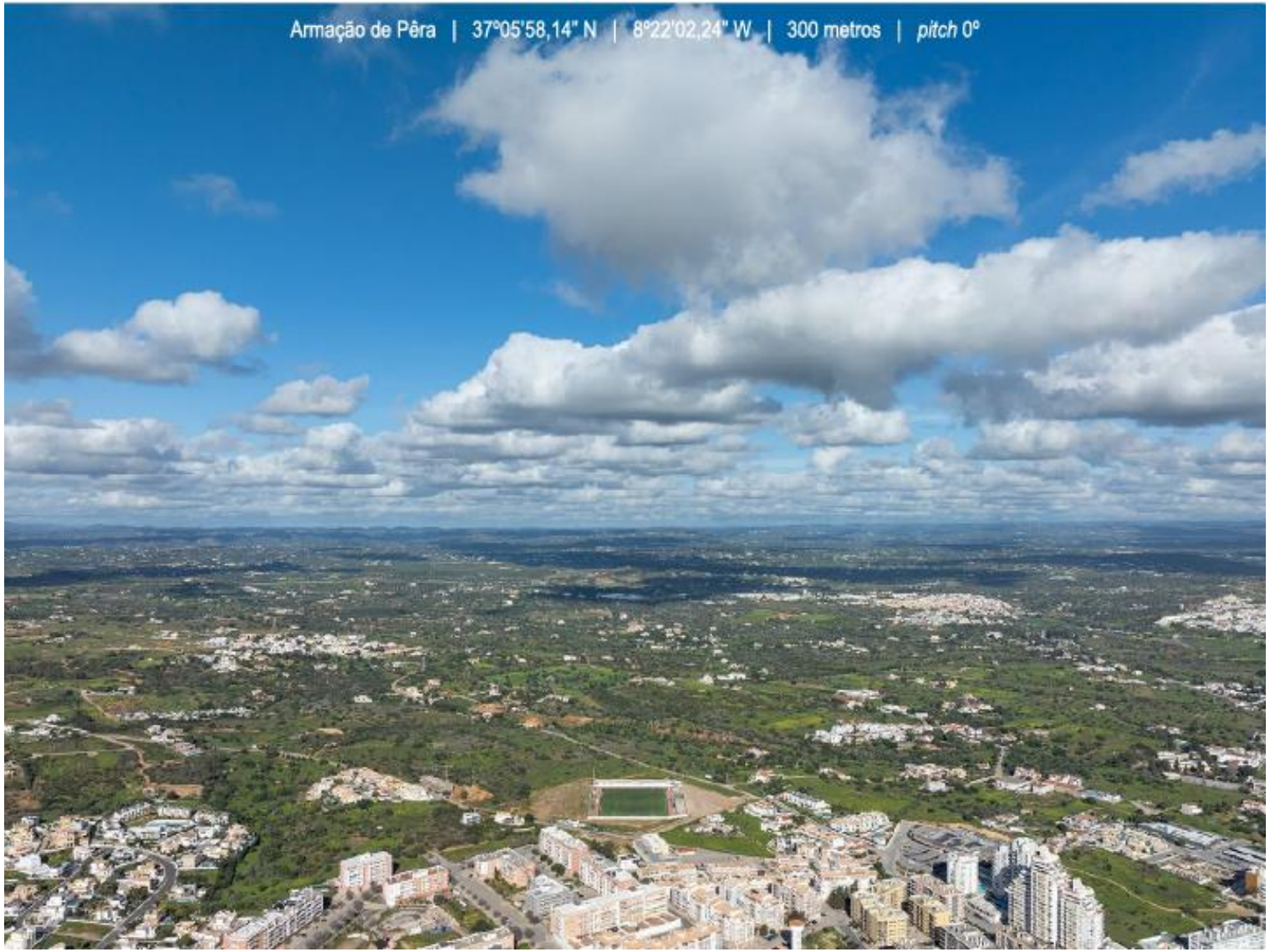

ANNEX II: PROPOSAL FOR A CURRICULAR UNIT ON PHOTOGRAPHY AND LANDSCAPE REPRESENTATION, ADDING THE PRESENCE OF DRONES AND BASED ON THE CURRENT CURRICULAR UNIT IN THE MASTER'S PROGRAMME IN LANDSCAPE ARCHITECTURE AT THE UALG

Learning Objectives (Knowledge, Skills, and Competencies)
The fundamental aim of this unit is to broaden students' knowledge and competencies regarding the use of photography as a visual option for landscape representation.
To achieve this aim, it is necessary to address aspects of:

- **Theoretical and Conceptual Nature:** This includes the potentialities and limitations of the "photographic gaze" on the landscape, bearing in mind that the landscape is always a "human construction" and that the image is invariably associated with perception, interpretation, symbolism, and communication of the landscape's identity.
- **Cultural Nature:** This involves the history of photography in general and landscape photography in particular, alongside the work of notable European and American photographers.
- **Methodological Nature:** This includes the principles of constructing a consistent and engaging body of photographic work.
- **Technical Nature:** This involves the use of contemporary photographic equipment and photographic editing techniques. The integration of drone technology is crucial in this context, as it allows for innovative perspectives and greater versatility in capturing landscapes.

Programme Content

- **Photography as a Representation of Landscape:**
  This section will cover the history of photography in general and landscape photography in particular, exploring both past and contemporary American and European schools and photographers.
- **Isolated Photography and Photographic Series:**
  Discussion will include message, symbolism, and communication with the audience, as well as the identity of the photographer and their body of photographic work.
- **Practical Photography:**
  Students will learn to plan their photography, take photographs, and edit their images. This includes panoramic photography, both at ground level and aerial perspectives, particularly utilising drone technology to enhance visual storytelling.

Teaching Methodologies (Including Assessment)
The unit will be conducted through a series of workshops, some of a more theoretical nature and others more practical. The instructor will provide students with a diverse range of documentation, enabling them to prepare individually for each workshop. In practical exercises, students will be encouraged to use a variety of equipment, ranging from DSLR and mirrorless cameras to smartphones and drones.
Assessment will comprise three components of equal weighting:

1. An individual written test assessing knowledge.
2. An individual or group written assignment on a topic agreed upon between the instructor and the student(s) at the start of the unit.
3. An individual portfolio on a topic agreed upon between the instructor and the student at the beginning of the unit.