

THE SPECTACLE OF NATURE IN VR AND THE SENSE OF THE SUBLIME

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Abstract

Virtual reality offers an innovative way to explore nature and succeeds in generating a strong sense of presence in simulated environments and intense emotions such as the sublime. The use of VR360 applied to natural landscapes allows for immersive experiences that bring people closer to nature, highlight its fragility, and stimulate new forms of ecological awareness. In an era marked by the biodiversity crisis, virtual reality positions itself as an ally for conservation, fostering environmental education and emotional engagement. The project “The Spectacle of Nature in VR and the Sense of the Sublime” unites virtual reality, biodiversity, and slow tourism in the Parks of Salento. Through VR360 reconstructions of priority habitats and coastal landscapes, the visitor is “teleported” into natural scenarios that would otherwise be difficult to access. This immersive experience reduces the impact of travel and promotes more sustainable and respectful tourism. VR360 is configured as a device capable of combining the aesthetic of the sublime, technological innovation, and the protection of biodiversity.

Keywords

Biodiversity, Nature, Video, VR, digital sublime

The virtual environment has evolved over decades of transformations, inventions, and ever-new technologies. For this reason, we did not immediately perceive that we were dealing with a new and different space from the real one. Nevertheless, we can now affirm that the advent of the virtual environment marks one of the most profound transformations in the history of human perception and culture.

Contemporary humans no longer live only in the tangible, perceivable world, but amid multiple worlds: the physical, the symbolic, and the digital.

Humanity has navigated the symbolic world - constructed through narrative, art, and philosophy - for millennia, yet today we face a new condition that some philosophers define as “hybrid.” This condition radically alters the way we construct our identity, understand reality, and consequently, experience the sublime.

In the virtual world, experience is no longer merely representation; it is simulated presence. The individual, endowed with body and perception, can act within an immaterial space that nonetheless elicits authentic reactions - fear, wonder, empathy, vertigo.

New digital technologies, particularly virtual and immersive reality, have introduced into the history of human perception a radical change: the

addition of a new environment alongside the natural and social ones that already exist.

Next to the physical world and the symbolic world of language and culture, a virtual environment has taken shape - an inhabitable space, artificially constructed yet perceived as real.

Unlike traditional media, which merely represented reality, immersive technologies generate realities of their own: three-dimensional environments in which individuals can move, act, and perceive coherently through the senses.

A 360° VR headset, for instance, does not merely display an image but creates the sensation of being *inside* the represented space. What changes is not only the instrument of vision but the very structure of experience: the observer becomes a participant; the spectator becomes an inhabitant.

The boundary between what is lived and what is simulated thus tends to dissolve, and reality appears as a continuum of experiences crossing the biological, the symbolic, and the digital.

Humans are no longer merely users of technology—they are integral parts of it, immersed in a system of interactions that alter their perception of time, space, and self.

From this perspective, the technological or digital sublime represents the aesthetic signature

of the contemporary age. Just as, before the grandeur of nature, humans once felt small, today they discover themselves both small - and immensely powerful - before the worlds they have themselves created. Infinity is no longer an external horizon to be contemplated but an internal product of the mind and technological language: humankind becomes the creator of the very infinity that transcends it.

It is within this ambivalence between creation and disorientation, control and vertigo, that the aesthetic and philosophical destiny of modernity is reflected. In this sense, technology is no longer merely an instrument but an anthropological environment, as proposed by thinkers such as Marshall McLuhan and Pierre Lévy - an extension of human faculties, a new horizon where body and mind interact with the digital as if it were a real place.

Cyberspace, as defined by William Gibson, is not a simple symbolic projection but a "territory" where experiences, emotions, relationships, and knowledge unfold.

All this connects - and will increasingly connect in the future - to the long cultural journey of humanity toward the quest for the sublime. Since the Romantic era, the sublime has emerged as a category of the soul, sought especially in the relationship between humans and nature.

Yet the sublime is not merely a philosophical reaction to Enlightenment rationalism: as early as the eighteenth century, it became a fundamental aesthetic category.

Edmund Burke distinguished between the beautiful (which evokes pleasure and harmony) and the sublime (which arises from what is vast, powerful, dark, or terrifying).

A practical example of this feeling: the sublime corresponds to controlled terror—such as when we contemplate a thunderstorm or a volcanic eruption from a safe distance.

For Immanuel Kant, the sublime is that which surpasses our sensory capacity, yet can be contained by reason. He distinguished between the *mathematical sublime*, which concerns immensity (for example, the infinite universe), and the *dynamic sublime*, which relates to the power of nature (storms, mountains, the raging sea, and so on).

With Romanticism, this conception of the sublime, mainly tied to nature, entered the arts. Hence arose representations of boundless,

terrifying landscapes - the Alps, the sea, the tempest - symbols of infinity and mystery.

Painters such as Caspar David Friedrich and writers like Byron, Leopardi, and Shelley sought to express this fusion of beauty and terror.

Returning to new technologies and the sense of the sublime, we may consider a practical example: *A Descent into the Maelström* by Edgar Allan Poe, a classic of Romantic literature. It is a terrifying depiction of a small fishing boat drawn into a perpetual whirlpool off the coast of Norway, from which only one sailor survives. The story was later visualized by artist Harry Clarke (1919).

Today, with a VR360 headset, we can relive that same terrible and sublime experience first imagined by the writer and then visualized by the artist - a result once hypothesized, now made (virtually) real.

The viewer is immersed in this vision and feels the same vertigo, fear, and sense of smallness before the power of nature imagined by Poe. Likewise, one can walk beside a Himalayan crevasse, glide over the Alps in a paraglider brushing the peaks, enjoy a sunset from a coastal tower in Salento, or dive among fish in a marine reserve - swimming with dolphins and exploring worlds otherwise unreachable.

Ultimately, new technologies have not destroyed the dimension of the real; they have expanded it. The virtual environment is not a mere duplicate of reality but an ontological extension of it - a new field of experience and knowledge through which humanity explores the self via its own creations.

For some, it is *hyperreality* (Baudrillard); for others, a *simulacrum* (Deleuze). These are virtual worlds that do not simply represent reality but replace or enhance it. As Merleau-Ponty explains, "we are not in space, we are space."

In the digital age, this very space multiplies and transforms but remains the place where human beings continue to seek the meaning of their existence - oscillating once again between the limit and the infinite.

Today, 360° virtual reality can generate a new kind of sublime: the *digital sublime*. Just as before a mountain or a stormy sea, VR can evoke disorientation, vertigo, and wonder when we face infinite, artificially generated spaces. It is no longer only nature that evokes the sublime, but technology itself - the human power to create worlds that imitate reality or imagination.

Ultimately, it is an experience that can be aesthetic, emotional, and almost metaphysical. While perceiving one's smallness before vastness - whether natural, represented, or entirely digital - humans simultaneously perceive their own greatness as creators.

This set of feelings and emotions can significantly contribute to safeguarding biodiversity, especially when combined with new technologies such as VR360 systems.

In an era when climate change and species loss threaten the balance of our planet, technology can become an ally of nature. VR360 - 360-degree virtual reality - is revolutionizing how we know and protect biodiversity, the totality of life forms on Earth.

According to experts, we are now facing one of the most severe extinction crises in history. Deforestation, pollution, urbanization, and climate change are drastically reducing species numbers and ecosystem health.

Here enters VR360, an immersive technology that allows exploration of real or digital environments in full 360 degrees. By wearing a headset, the viewer can stand in the heart of the Amazon rainforest, swim among coral reefs, or fly over the Himalayas - all without leaving home.

But it is not only visual wonder: VR360 is emerging as a powerful tool for environmental education and awareness.

Schools, universities, and environmental organizations are using it to convey the beauty and fragility of nature in an immediate and engaging way.

As a VR360 content creator, I have explored projects such as *Our Planet VR*, *WWF Into the Wild*, and *UNESCO VR Nature*, which offer breathtaking virtual experiences - tropical forests, deserts, coral reefs, and glaciers unfold before the user's eyes in an educational and sustainable journey.

Inspired by these experiments, the project *The Spectacle of Nature in VR and the Sense of the Sublime* was created - an environmental education and slow, eco-friendly, and accessible tourism initiative presented during the *International Day for Biodiversity* organized by CEIT (Euro-Mediterranean Centre for Technological Innovation for Cultural and Environmental Heritage and Biomedicine), the University of Salento - Department of Mathematics and Physics "Ennio De Giorgi", ISUFI Graduate School, the Polytechnic University of Bari, the City of Cavallino, and the Cavallino Open-Air Museum.

With the contribution of the Lecce Chamber of Commerce for technological innovation in the tourism sector, an initiative was realized to promote slow, conscious, ecological, and respectful tourism.

The focus was placed on VR360 reproductions of areas of high environmental value, such as the parks of Salento: the Otranto-Leuca-Tricase Forest and Vallonea Woods Regional Park, the Litorale di Ugento Regional Nature Park, the Sant'Andrea Island and Punta Pizzo Coastal Park, and the Rauccio Forest and Marshlands Regional Park - all of great ecological importance and rich in priority habitats.

Attention was also given to ecosystems easily accessible yet often overlooked: Italy's wild orchids (Ruggiero, Medagli, & Turco, 2024), wetlands, lake-to-sea transition systems, and coastal dune and back-dune belts (Paiano & Cazzato, 2000). For this purpose, the focus was on the Sites of Community Interest (SIC) within the Province of Lecce (Accogli, Medagli, Arzeni, & Marchiori, 2010), some of which hold enormous significance not only for biodiversity but also for history and landscape (Valzano, Negro, & Lucarella, 2019; Costantini, 2024) —such as Torre Uluzzo, Torre dell'Orso, the Alimini Lakes and dunes, Palude del Capitano, and the Posidonia meadows of Capo San Gregorio-Punta Ristola.

The creation of high-quality immersive content and virtual experiences today relies on advanced yet accessible technological tools, capable of combining precision, speed, and aesthetic performance.

Among the technologies used in the project are the Insta360 camera and its dedicated software, which enable the capture and processing of 360° images and videos with a level of simplicity unimaginable only a few years ago.

Complementing these tools is Adobe Premiere Pro, a professional video editing platform that allows for the editing of immersive footage, optical flow correction, insertion of spatialized sound and titles, and export in formats compatible with VR headsets.

The current workflow makes it possible to produce a fully edited film using on-site shooting and professional post-production in just two days, compared to the months of synchronization and rendering once required — including multi-camera acquisition, video alignment, and audio synchronization.

In the past, producing immersive content demanded expensive, complex, and bulky equipment: multi-lens synchronized cameras, separate stitching software, and slow, often imperfect rendering.

Modern systems such as Insta360, originally developed for sports and outdoor environments, have revolutionized this scenario.

With a single compact device, it is now possible to record ultra-high-resolution, stabilized footage ready for immediate processing.

The democratization of VR technology has therefore enabled independent creators, researchers, public institutions, and even agricultural enterprises to produce immersive experiences at sustainable costs and within manageable timeframes.

Another major step forward is represented by the integration with new-generation immersive headsets, such as Meta Quest, which allow a direct and intuitive enjoyment of VR360 content.

During tourism fairs and cultural events, the use of these headsets has resulted in thousands of visitor interactions, confirming the high communicative and emotional potential of these technologies.

The audience is no longer a mere spectator but becomes an integral part of the experience: they can move freely through space, interact, choose their viewpoint, and fully immerse themselves in recreated natural landscapes or cultural sites.

Alongside professional headsets, lighter and more accessible systems remain essential — such as Google Cardboard or smartphone-based 360 viewers, which allow users to access immersive content simply by inserting their phone into an inexpensive support.

This accessibility has facilitated the spread of VR culture among schools, local institutions, and tourism operators.

Equally important is the distribution of content. Platforms such as YouTube 360 now allow creators to publish, share, and view immersive videos directly online, paving the way for a global

and participatory experience of natural and cultural heritage.

In this way, experiences produced in local contexts — such as the Parks of Salento — can reach a global audience, amplifying the educational and environmental message of the project.

In summary, the shift from early, complex VR systems to integrated and user-friendly solutions such as Insta360 and Meta headsets has turned immersive reality into a universal language, capable of uniting aesthetics, education, and sustainability.

The simplicity of use, combined with the evocative power of 360° imagery, now allows us to transform digital sublimity into a tool for knowledge, preservation, and enhancement of the real world, continuing the dialogue between art, technology, and nature that has always accompanied human history.

The combination of biodiversity and VR360 opens new frontiers for tourism, as the project connects with local hospitality initiatives promoting *Holoholiday*. The pilot project, co-funded by the Lecce Chamber of Commerce and Masseria Panareo of Otranto, aims to offer tourists a true “teleportation” experience inspired by 1970s–1980s sci-fi films.

A special cabin, modeled after the “teleport room” of the *Starship Enterprise* from *Star Trek*, allows visitors to explore the nature of Salento through immersive reality.

This is, of course, a temporary step - anticipating a near future in which immersive technologies will further reduce travel impact, enhance ecological awareness, and inspire new generations of conscious citizens.

This first experiment demonstrates that VR360 is not only an excellent tool for sustainable tourism but also a stimulus to love and protect nature. For only by knowing the richness of biodiversity -even through a screen - can we feel the desire to see it in person, to love it, and to preserve it.

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