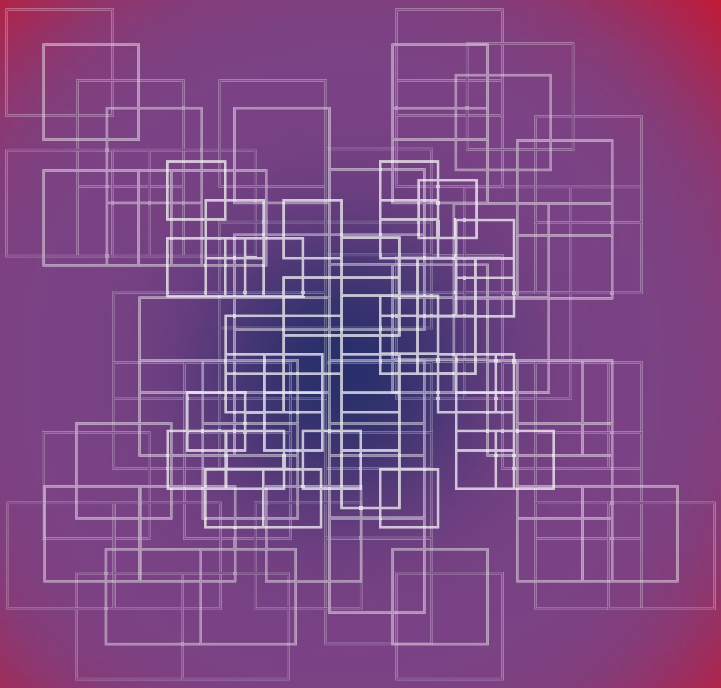

# Visuality

## from research to public engagement

edited by
Fabrizio Bracco

GENOVA UNIVERSITY PRESS

*Visualità*

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# Table of contents

# Preface

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This edited book focuses on visuality, as both the process and outcome of interpreting the world through visual perception. To be tackled properly by academic research, visuality calls for an interdisciplinary approach. Consistently, this book encompasses various fields, including art, architecture, media studies, image processing, and multisensory representation. The cross-cutting aim of the different chapters is to reflect on how visuality can become a powerful tool for public engagement by influencing how people interact with information, spaces, and communities. Thus, providing academic research with strategies and means by which to reach a broader audience, and contribute to the public process of knowledge production.

A series of lessons can be learnt in this sense drawing from other fields of social life and cultural domains where visuality plays an established role in engaging different audiences. In the realm of art, visuality has long been a bridge for communicating profound social, political, and cultural ideas to a transversal audience. Public art – such as graffiti, sculptures, and installations – acts as a dynamic medium through which artists engage and uplift communities. These works often spark dialogues that challenge norms and inspire positive change, also thanks to the capacity of art to stimulate conversation in exhibitions and public spaces, transcending linguistic and cultural barriers with evocative non-verbal language. Drawing from these experiences, academic research can be pursued more ambitiously in terms of dissemination and actual impact on society, fostering civic dialogue and advocacy for social change.

Another relevant inspiration can be found in the application of the notion of visuality in architecture and urban design, being visual and spatial disciplines that apply it to shape how people experience and interact with their environments. Scholars in these fields examine how visual elements – such as design, form, and texture – impact public engagement with space, questioning issues related to inclusivity and accessibility of visual components. Well-designed public spaces

(like parks, museums, or urban squares) can encourage social interaction, relaxation, and political gatherings. Research also investigates the social psychology behind spaces, exploring how specific visual aspects can create feelings of welcome or alienation. Furthermore, the integration of technology, such as augmented reality or interactive installations, is changing public engagement with architectural spaces. The lesson for academic research here mostly relates to the dimension of participation of different target groups.

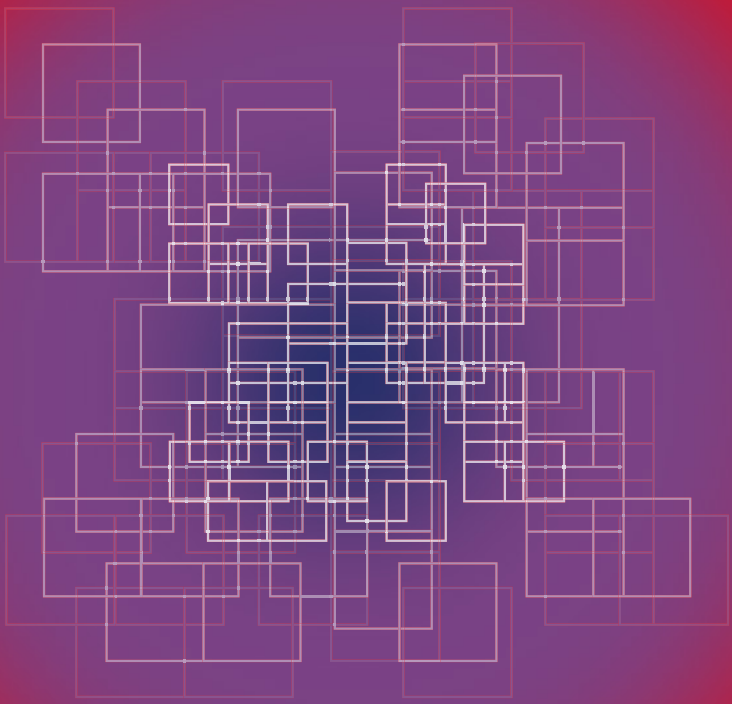
A key area for visuality today is image processing and data visualization. With the rise of big data and complex digital systems, researchers are focusing on how visual tools can enhance public understanding of abstract or intricate information. By converting numerical data into visual forms, researchers aim to engage the public in discussions regarding critical global issues, such as climate change, public health, and economic inequality. In this context, image processing acts as a tool that democratizes access to knowledge, making complex subjects accessible and understandable. Through visuality, traditional praxis of knowledge dissemination can be subverted, by lowering the threshold of accessibility of scientific outputs.

Finally, visuality can expand the range of its applications pursuing a multisensory approach. Bringing together sound, touch, and movement, a holistic approach to public engagement can be targeted. Research in neuroscience, design, and virtual reality explores how these immersive experiences transform our interactions with both digital and physical realms. By appealing to multiple senses, public engagement becomes inclusive, resonating with diverse audiences – including those with visual or auditory impairments.

This book presents papers from researchers at the University of Genoa, members of Civis (Interdepartmental Center for Visuality), discussed during the 3rd Seminar Day "Visuality: from research to public engagement," held in May 2023. The challenge of the Seminar Day was to transform any visual source into a space for dialogue, learning, participation, and possible solutions for advancing research and knowledge. The interaction and synergy between social, humanities, and technological disciplines can lead to a contamination and shared readings of reality. The goal of this event, in continuity with previous editions, and of the center's mission, was to:

- present and discuss stories of visuality, research, and participation based on experiences from the center's members,
- identify areas of application and participatory impact on and with communities,
- stimulate new collaborations between social, humanities, and technological disciplines to be developed within the center.

The outcome of the Seminar Day is organized in this volume, divided into three sections. Each contribution having undergone double-blind peer review.
The first section, "Visual Processing," consists of two contributions. The first highlights how the expansion of 3D surveying techniques is transforming contemporary art by enabling active public participation, allowing interaction with works of art through digital platforms and enhancing the artistic experience. The second presents two case studies that adopted different methodologies and approaches to create online archives using the traces and documentation produced about performances, attempting to provide the user with the body of work of the performances themselves.
The second section, "Multisensory Representation / Visual Perception," includes three works. The first outlines a research project based on the paradigm of the visual representation of sound, while the second explores the potential of the Metaverse in restructuring the way knowledge is transmitted in educational settings through immersive environments. The third research examines the integration of art as an auxiliary tool for therapeutic purposes in childhood rehabilitation, focusing on principles for selecting images based on the characteristics of the pathology under review.
The third section, "Visual Expression," also presents three works. The first explores the interaction between individuals and their environment through the Photovoice technique to shed light on factors influencing the well-being of young adults and identify strategies and possible solutions for promoting individual and community empowerment in relation to places. The second contribution reflects on the role of the popularization of abstract art, aiming to define abstraction not simply as an artistic style but as a historical condition. The third paper develops through the study of two contemporary book that sought to explore humanity's position within its habitat and establish an inventory of the world: on one hand, the wonder of the physical reality, and on the other, its potential danger.
It seems only right to thank all those who have contributed with their direct or indirect participation to the realization of the Civis day event and made the writing of this book possible. From the authors to the reviewers, from the Coordinator of the Interdepartmental Center on Visuality, Prof. Maria Linda Falcidieno, to the Delegated Coordinator Prof. Enrica Bistagnino, from the Board of the Interdepartmental Center on Visuality, to the Curator of the GUP Series on Visuality Prof. Elisa Bricco, GUP.
This book represents the outcome of an increasingly close interaction between researchers from different disciplines who engage in discussions on current issues and challenges with the aim of building an ever more interdisciplinary and integrated body of knowledge.



# Visual processing

# 1. Three-dimensional survey systems: a new art form

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In the digital age in which our society is immersed, there is a remarkable expansion of 3D surveying techniques. These are no longer simply precision tools intended for scientific documentation or industrial application, but are emerging as true art forms, opening up a new creative dimension. The intersection of advanced technology and creativity is shaping a novel and exciting landscape for artists around the world, enabling them to explore the language of the third dimension in innovative ways. In this article, we will delve into how 3D relief techniques are grafting a significant impact on contemporary art and how artists are employing such tools to transform their deepest visions into concrete and tangible works of art.

The advent of the digital age has brought with it a profound revolution in the approach to art. Traditional media, while remaining timeless, are now coexisting with new forms of expression that take full advantage of the potential of advanced technologies. 3D relief represents one such revolution, enabling artists to push beyond two-dimensional limits, bringing a new dimension to their creativity. This convergence of creativity and technology opens up completely unexplored horizons, offering artists an unprecedented playing field.

In the sign of the third dimension, artists find a digital canvas on which to paint their dreams and visions. Contours become deeper, surfaces come to life, and objects stand out in space with a concreteness that defies tradition. This new artistic frontier is no longer constrained to classical canvases or bronze sculptures, but can exist in digital form, be modeled on computer screens and, if desired, take physical form through 3D printing.

A plurality of artistic expressions therefore emerges ranging from digital sculpture, which allows artists to shape virtual matter with a freedom unthinkable in the real world, to interactive art, which uses virtual reality to involve the viewer in immersive and participatory experiences. Also think of 3D projections, where light and physical space merge to create art in constant movement and transformation. But the essence of this artistic revolution lies not only in creation, but also in shar-

ing. The art of 3D surveying is often highly accessible and can be shared easily with the entire world via the internet. Artists can share their digital models, allowing audiences to interact with their works in ways never seen before. This amplifies the experience of art, transforming the passive observer into an active participant.

## 3D surveying systems to create art

In contemporary art, 3D survey systems are emerging as innovative and fascinating tools for artists. These tools, initially developed for technological and scientific applications, have opened up new creative possibilities in the world of three-dimensional art. One of the most obvious strengths of capturing reality through 3D relief systems is the extraordinary precision with which physical details are recorded. These systems use a variety of techniques, including laser scanners, photogrammetry and stereoscopic sensors, to measure with extreme precision the distance between the capturing device and points on the surface of objects or environments. The result is an incredible amount of three-dimensional data that captures every facet of what is being scanned.
Once the three-dimensional data has been acquired, the artists enter the creative processing phase. This is the stage where the dots, figures and data become the canvas on which to paint the imagination. Artists can digitally manipulate the data, add details, change proportions or deform shapes to create completely new works of art. Technology thus becomes a tool for amplifying artistic creativity.
Contemporary artists include Cedric Kiefer and Daniel Franke, authors of the work 'unnamed soundsculpture'. This work represents a perfect fusion of human movement and digital art, challenging traditional artistic conventions and opening up new horizons for contemporary art. The inspiration for "Unnamed Soundsculpture" originated from human movement, in particular the talent of a professional dancer. The dancer became the central subject of the work, as her elegant and fluid movements were captured in real time using three depth cameras (Kinect), which were then correlated to generate a three-dimensional point cloud. This technology enabled data of the dancer's movements to be captured with exceptional precision, recording every movement, gesture and body position.
Once they had acquired the three-dimensional data of the dancer's movements, Kiefer and Franke took on the challenge of transforming them into a unique digital work of art[1]. Using sophisticated 3D processing and modelling software, they

[1] For more information visit the website: https://onformative.com/work/unnamed-soundsculpture/

created an evolving digital sculpture that reproduced the dancer's movements. This digital sculpture came to life on the screen, with a myriad of light spots that synchronously followed the dancer's movements and choreography.
But "Unnamed Soundsculpture" was not limited to the visualisation of movement data. The artists took the work to the next level by integrating sound as well. The work's soundtrack was generated in real time, based on the dancer's movement data. Each gesture, each movement, influenced the music, creating an extraordinary synergy between sound and movement. This interaction between the human body, digital art and music made the work an immersive multisensory experience. "Unnamed Soundsculpture" challenges the traditional perception of art, inviting the viewer to explore the connection between the human body and its digital representation. The evolving digital sculpture is a representation of human movement, an art form that goes beyond the boundaries of traditional physical sculpture. The work questions the concept of reality and the relationship between the human being and the digital world (fig. 1).

Fig. 1. Cedric Kiefer and Daniel Franke, "Unnamed Soundsculpture".

Another artist who uses and interprets data from three-dimensional survey techniques and methodologies is the Frenchman Antoine Delacharlery[2]. His creation "Ghost Cell" offers a reinterpreted vision of everyday life in the French capital. This work makes use of point cloud images and wireframe models, of-

[2] More detail and work are present in the website: http://www.antoinedelach.com/

fering an almost microscopic detail, although not without some imperfections. Indeed, the slogan accompanying this short six-minute film is «an immersion into the bowels of an organic Paris seen as a cell through a virtual microscope». The inspiration for this unusual perspective on the city originated from two sources. Firstly, Delacharlery noticed how increasingly common 3D scans obtained using technologies such as LIDAR or photogrammetry were in architecture and film. Although the main use of these 3D scans is measurement, he saw something ghostly and mysterious in the resulting images, which inspired him.
The inspiration for this unusual perspective on the city came from two sources. First, Delacharlery noticed how increasingly common 3D scans were using technologies like LIDAR or photogrammetry in architecture and film. Although the main use of these 3D scans is measurement, the director glimpsed something spooky and mysterious in the resulting images, which inspired him.
Secondly, Delacharlery had a specific idea he wanted to tell about Paris: «The film is about the expansion of life and the similar patterns between the human structure and the patterns of nature" [...] "There was actually a scientific study that compared the growth of a mushroom and the path of a city street, and it turned out exactly the same pattern».
Furthermore, in an interview, the artist declares that he took inspiration from Godfrey Reggio's 1982 experimental film Koyaanisqatsi. This film included sequences shot in slow motion and time-lapse of cities and landscapes in the United States, cleverly combining these images with the director's life experience as a child growing up near Paris.
"Ghost Cell" (fig. 2) was produced by the French production company Autour de Minuit and was presented at various festivals, earning the audience award at the Clermont-Ferrand International Short Film Festival.

Fig. 2. Antoine Delacharley, Frame estracted from the film "Ghost Cell".

"In the Eyes of the Animal" (fig. 3) is an extraordinary example of how contemporary art relies on advanced technology to create immersive and innovative experiences. Using virtual reality, London-based studio Marshmallow Laser Feast has created a digital environment that simulates the vision and sensations of various animals. Viewers wear VR headsets and are transported to a completely new sensory world. This project offers participants the chance to see the world as animals see it. For example, through the eyes of a hawk, the landscape unfolds at astonishing speed, allowing you to perceive details differently than human perception. A bat's night vision reveals a world illuminated by the light of stars and fireflies. This immersion in animal perceptions offers a deeper understanding of how these creatures interact with their environment. "In the Eyes of the Animal" is not only an extraordinary sensory experience, but also a reflection on the relationship between human beings and nature. We often consider our view of the world to be the only valid one, but this installation challenges us to consider the multiple perspectives present in the animal kingdom. This can lead to greater awareness of the interactions between humanity and the natural environment.
This project demonstrates how technology can be used as a creative tool to challenge and expand the frontiers of art. Marshmallow Laser Feast combined advanced computer graphics, immersive sound and VR interactivity to create an experience that goes beyond traditional art. It is an example of how technology can be used to educate, raise awareness and inspire the public through a new artistic language. "In the Eyes of the Animal" gained international recognition and attention. It has been featured at art and film festivals, receiving praise for its innovation and its power to transform human perception.

Fig. 3. Visitors enjoying the immersive experience of the "In the Eyes of the Animal" installation (credit: Sandra Ciampone).

"FRAMERATE: Pulse of the Earth"[3] is another example of how point clouds can be used to express a message in a video production. Created by Matthew Shaw and William Trossell, produced by ScanLAB Projects (Anetta Jones, Matthew Shaw, William Trossell), the video tells how the landscape undergoes profound transformations caused by man and natural forces. The installation involves the projection of three-dimensional videos that take place on different screens where the viewer is guided by the movement of the audio. The sun shining in the sky and the leaves falling, a pumpkin growing, the action of man moving tons of steel, the sand modifying the coast based on the tide are some of the video clips that tell the story of the ever-changing landscape. This work is created through daily 3D scans edited in time-lapse to make change faster, more frenetic, almost inevitable. The images are not only an artistic expression for the short film, but are above all the three-dimensional photography of a specific moment. Data that can be used by specialists to determine the relationship between nature and man.

## Digital survey for knowledge

The three-dimensional survey represents a powerful key for deepening knowledge in various sectors. This advanced technology enables detailed and precise documentation of the physical world, allowing experts to more effectively analyze, study and preserve cultural heritage, the natural environment, engineered structures and more.
3D surveying offers a deep and detailed exploration of physical objects, environments, shapes and structures, providing a valuable key to deepening knowledge in various sectors.
Point clouds are a highly detailed set of three-dimensional coordinates that represent the surface of an object or structure. Their representations within three-dimensional viewers, or even simply through monitors, are the first step in understanding the spatial composition of objects and architecture. Leaving aside the countless technical uses that three-dimensional survey technology can offer, point clouds can be considered the photograph in a given time of the actual state of the detected object. Coding in spatial coordinates, sometimes even with the attribution of a color, can become navigable virtual scenarios, where all users can appreciate volumes and environments that in many

[3] More detail and work are present in the website: https://scanlabprojects.co.uk/work/framerate/

cases cannot be visited. This is the case, for example, of the Campanile delle Vigne in Genoa (Di Napoli, 2021). The subject of an in-depth study to evaluate accessibility to the public, the laser scanner survey was used to create a virtual journey inside. The clouds, transparent and in some cases evanescent, make the video full of emotions, leaving the visitor the possibility of imagining the reality of its shape. The video produced on this occasion is a simple walk-through created using one of the many point cloud management software programs. The non-cleaning (technical term used to indicate the non-removal of all those scanned areas or objects not necessary for the study) of the point cloud enhances the experiential moment of those who see it. Silhouettes of people passing by and lack of data in some points are some of the strong points that help the visitor understand how the structure has been experienced and modified over the centuries.
In the case of creating static images of point clouds, their lightness, precise definition and the use of transparencies can lead to views that are difficult, if not impossible, to replicate in reality. An example could be the images created using the database collected during the survey campaign of Borgo Castello di Andora (SV)[4]. The data collected in this survey campaign saw the acquisition not only of the ruins present around the Castle, but also a large part of the hill on which they are located. By modifying the transparency of the point and changing the reflectance display of the material it is possible to obtain particular and suggestive images. The zenithal view of the surveyed area shows how the terrain is particularly impervious and structured in steps (fig. 4). Trees with green trunks and reddish foliage stand out more from the buildings. If we then get closer and frame a single ruin, the image of the ruin is evocative and seems evanescent compared to the nature that surrounds it (fig. 5).

[4] For the use of the data we thank the arch. Paolo Ghione and the arch. Roberta Possanzini of the Municipality of Andora (SV). The survey campaign is the result of the collaboration between the DICCA Department and the Municipality of Andora (SV) for the PNRR project entitled "BORGO CASTELLO - REMEMBER THE PAST TO BUILD THE FUTURE".

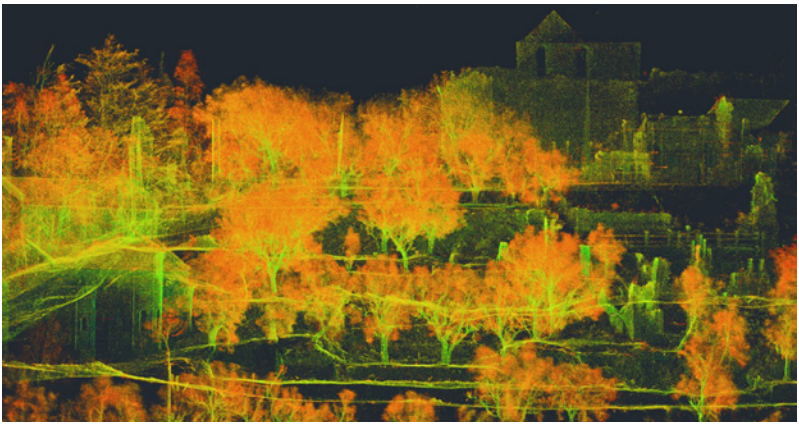

Fig. 4. Zenith view of the point cloud of Borgo Castello di Andora.

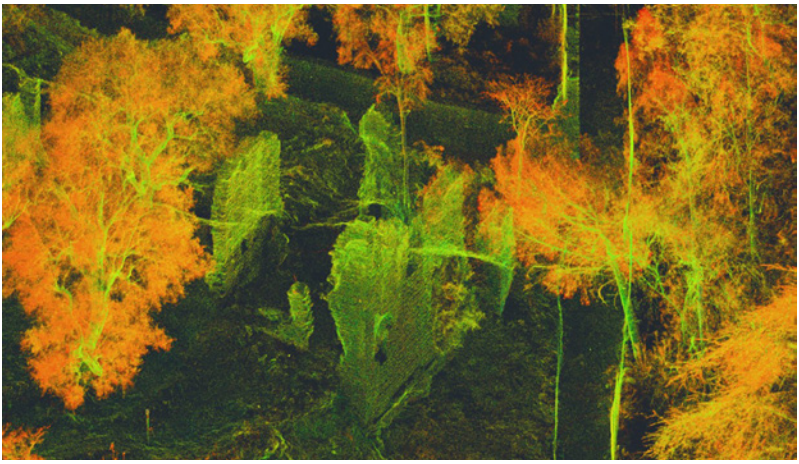

Fig. 5. Image of a ruin found in Andora.

## Conclusions

Three-dimensional survey systems, which include 3D laser scanners, photogrammetry and depth sensors, are revolutionizing artistic creation. While traditional art has always faced the dilemma of representing the three-dimensional world in two-dimensional works, three-dimensional relief systems allow artists to capture and explore three-dimensionality in ways never seen before. The future of art using these systems is full of promise and innovation.

First, three-dimensional survey systems allow artists to capture the essence of objects, environments, and even people with extraordinary precision. 3D laser scanners, for example, can capture millimeter detail, capturing the texture, shape and depth of a subject accurately. This precision opens the door to new forms of realism in art, allowing artists to create works that almost seem to live and breathe.

Furthermore, art based on three-dimensional survey systems is inherently interactive. The works can be explored dynamically by the observer, often using immersive technologies such as virtual reality or augmented reality. This approach to art challenges the passivity of the traditional observer and actively involves him in the work itself. The observer becomes an integral part of the artistic experience, interacting with the work in ways that change perspective and perception.

Another area of innovation is the convergence of art and science. Data captured by three-dimensional survey systems can be used for scientific purposes, from documenting historic sites to creating models for medical research. This collaboration between artists and scientists is resulting in works of art that explore complex scientific concepts, offering a new lens through which to understand the world.

Art based on three-dimensional survey systems is also breaking down spatial and temporal barriers. Artists can collaborate across the world, combining data from remote locations to create collaborative works of art. Time itself becomes an artistic medium, as works can evolve and change over time, documenting the mutability of our world.

However, with these opportunities also emerge challenges. Managing the vast datasets generated by three-dimensional surveying systems requires technical expertise and resources, while concerns about privacy and ethics in the use of sensing technologies must be addressed. Art based on three-dimensional data could challenge traditional definitions of art, pushing the art world to redefine its conceptual boundaries.

The future of art with the use of three-dimensional survey systems is a fascinating and constantly evolving frontier. These technologies open new doors to artistic creativity, from the precision of detail to the interactive nature of the works. At the same time, technical, ethical and conceptual challenges emerge, forcing the art world to explore new directions. Three-dimensional art presents itself as a field in which the artist's imagination and the power of technology meet to create unprecedented artistic experiences.

## Reference

Di Napoli B., Calderini C., Vecchiattini R., Battini C. (2021). Il campanile di Santa Maria delle Vigne a Genova: conoscenza e analisi finalizzate alla redazione del progetto di restauro e visitabilità. In F. Giovanetti e G. Brunori (Eds.), I BUONI INTERVENTI DI RESTAURO: CONSERVAZIONE, ADEGUAMENTO, RIUSO, atti dell'VIII convegno nazionale ARCo Napoli, Palazzo Reale, 8 e 9 marzo 2019. Edizioni Roma TrE-PRESS. http://dx.doi.org/10.13134/979-12-80060-81-5

# 2. Visual Representations of Performing Arts Cultural Heritage

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## Traces of the Intangible

Over the past thirty years, several performance theorists have questioned the possibility of archiving the performance and the social, political and cultural contents it conveys (Phelan, 1996; Taylor, 2003; Shneider, 2011). However, the live performance is intangible, and its contents are ephemeral, as they are expressed *hic et nunc*, in the moment of co-existence and sharing between actor and spectator, beyond which nothing concrete remains. Nevertheless, performing arts scholars «are convinced that the live performance leaves traces, not only of its being happened but also of planning phases as of consequent studies, such that it is still possible to study it even in the absence of direct testimonies» (Bignami, 2013, p. 29). So, it is about archiving the traces coming from the live performance. One might wonder why the residual traces of the performance should be preserved. UNESCO (2003) defined intangible cultural heritage as «practices, representations, expressions, knowledge, skills […] that communities, groups and, in some cases, individuals recognize as part of their cultural heritage», including the performing arts among the sectors in which the intangible cultural heritage is manifested (p.2). Subsequently, the UNESCO Convention on the Protection and Promotion of the Diversity of *Cultural Expressions* (2005) established that «those expressions that result from the creativity of individuals, groups and societies» are protected (p. 13). Therefore, considering the live performance as an artistic manifestation that is built through a specific practice – and that expresses and conveys historical, political, cultural, and social contents – we can affirm that the traces linked to it constitute a tangible and material testimony both of the intangible cultural heritage and of how it is expressed.
However, it is not essential to preserve a single trace, but the set of traces and documentation produced to create and show a performance. In other words, as Roms (2013) argued, it is crucial to preserve legacies, that is, the inheritance

that performance leaves behind. In addition, Roms (2013) insists on the concept of "archive", stating that a document testimony only a piece or a part of the performance, but what must be archived and preserved is the *body of work*, i.e. the set of material traces and their relationships that, placed in a specific context, have the aim of returning – to those who study the performance a posteriori – a representation of the performance as a collective and varied artistic project, to which more authors contributed (director, actors, costume designer, light designer, sound designer) and built from different elements (dramatic text, scenic space, costumes, lights, sounds) (p. 36). In fact, what outlines the context in which performance has been produced, represented, and enjoyed is constituted by the relationships that every single trace or document possesses with the others. These relationships form a connective tissue otherwise known as an *archival bond* that expresses the "development of the activity" in which the document has participated, demonstrates the "cause-effect relationship" established between one document and another, and above all, determines the meaning and function that the archival document possesses when placed in a particular context (Duranti, 2021, p. 24). When talking about archives whose objects are the performing arts, it is helpful to keep in mind the concepts of *body of work* and *archival bond* precisely because they are functional to the attempt to formalize and materialize through testimonial and residual traces, artistic objects whose production process and the consequent expressions are ephemeral and intangible.

In a physical archive, the relationships between the documents are easily identifiable thanks to the operations of ordering and description because, according to how the documents are sorted and thanks to the search tools and equipment that describe both the location and the content, the user can easily identify the relationships that link the documents to each other and consequently trace the steps that have affected and determined the activity of an institution or a natural person. But as for an online archive, the fluidity and immateriality of the digital environment, while on the one hand, they offer greater access and consultation, on the other, they amplify various problems. An online archive is not a simple digital transposition of a physical archive but rather an extension of it: in the web, given the dynamic nature of the environment, the archive is not only accessible and searchable, but also and above all navigable, for this it is necessary to give the digital platform the ability to mediate between the documentation and the user (Valacchi, 2015, pp. 165-166). In this context, the documents lose their physical consistency and their original place, so that it becomes difficult for the user to identify the context in which a single document was produced and its relationships with the documents that have determined or that testify to the development of an activity. At this point, wanting to return

the user a representation of the *body of work* through the residual traces of the performance, it becomes of fundamental importance to characterize operating modalities in order to adapt to the language of the web traditional description and archival research tools like lists, guides and inventories.
The following paragraphs present two case studies that have adopted two different methodologies and approaches. Although they are two entities with different characteristics, they have created two online archives using the traces and documentation produced about performances, trying to give back to the user the body of work of the performances themselves.

## From the archival description software to the document digital representation. The archive of the Istituto per il Teatro e il Melodramma of the Fondazione Cini in Venice

The Fondazione Giorgio Cini was founded in 1951 and since its inception has promoted humanistic research. Today Fondazione Cini is located on the Island of San Giorgio Maggiore and is a studies centre, a venue in which

> academic activities – research projects and events aimed at improving our 'knowledge of the world' – continuously interact with thinking on the current political and social scene aimed at promoting multidisciplinary approaches and experimenting with exchanges between forms of knowledge and various scientific and professional cultures. The intention is thus also to provide innovative tools for analysis and comprehension, as well as propitious opportunities for 'building a new world' (Fondazione Giorgio Cini, 2023).

The archive of Fondazione Cini is placed in the world of scientific activity and research as a collector subject, i.e., as an institution that, for institutional reasons, acquires archives of other bodies or people in turn independent of the same (Carucci, 2021, p. 169). In essence, as regards the fonds of the Istituto per il Teatro e il Melodramma, the artists themselves or their heirs have donated to the foundation entire documentary complexes that belonged to them or were inherited by them. We are therefore faced with a complex fond, consisting of a plurality of fonds merged within the archive of a specific entity, precisely defined collector subject, so that there is no hierarchical link between the collector's archive and the fonds merged in it, which have an autonomous and distinct configuration (Carucci, 2021, p. 164)
Since 2014, with the aim of making the documentary heritage accessible to the community of scholars and enthusiasts – and enhancing it, ensuring its perfect preservation and durability «a systematic computerisation campaign was be-

gun with the aim of digitalising and making an inventory of the Foundation's collections and archives» (Fondazione Giorgio Cini, 2023a).
To create the digital platform for access and research, the Fondazione Cini has made use of an archival description software, that is, a tool for «supporting the ordering and inventory work», self-standardizing, as it reproduces in the digital environment the traditional practices of archival description dictated by international standards. What is interesting are the functionalities that such software possess, mainly consisting of the possibility of generating and managing context information related to a single document and facilitating user access and consultation to schedule outputs available in different formats (Valacchi, 2015, p. 151). In particular, Fondazione Cini has treated its heritage through xDams (xml Digital Archives Memory Storage), an open-source software developed in ASP mode (Application Service Provider) by the Italian company regesta.exe, which it has made available to the archival community «a multimedia and web-based document platform, specialized in the analytic description and management of various types of materials and information in the Cultural Heritage domain» (xDams Platform, 2023). Fondazione Cini used the platform to take advantage of the possibility of making the xdams Bridge plug-in on the WordPress CMS, so the remote archive consultation allows the user to view the documentation in parallel with its description.
The Fonds Eleonora Duse keeps numerous scripts and dramatic texts annotated by the famous Venetian actress. The user, viewing the page dedicated to a script, interacts immediately with the cover of the script itself and with its precise description. In addition to the "Identification Area" – which states authorship, bibliographical data and physical consistency of the document – what is essential for the user is the "Content Area", which provides an "Abstract" concerning the actual narrative content of the text and offers a description of the annotations present in the document referring to reliable bibliographical sources through which the annotations themselves have been studied and described (Fig. 1). For example, facing *Così sia*, dramaturgy by Tommaso Gallarati Scotti, annotated by Eleonora Duse, it is important for a theatre scholar to have a description of the annotations because at the time of viewing the document (Fig. 2) s/he must interpret the meaning of the signs. In fact, on the description page appear the words:

> The text has been intensively studied and reworked by Eleonora Duse, whose notes, drawn in pencil and pen, are numerous, with a particular density in correspondence to the highlights of the drama: the ending of the first, second and third act.
> Diagonal strokes, sometimes in a wavy variant, always characterize the mother's lines and the captions related to her, constituting a visual aid for the actress in

> reading and studying the part. These signs resemble those wavy, thicker and dilated, which recur as a constant in the script, corresponding to significant variations in the emotional atmosphere of the drama (Fondazione Giorgio Cini, 2023b).

But if we want to analyze the staging of a text, the document's description and the annotations contained therein are not enough for the performance scholar to have an idea of the *body of work*. It is no coincidence that the page of the annotated dramaturgy *Così sia* proposes a column of "Related Documents", whose first entry - ""Duse Now", 20 June 1923" (Fig. 1) - is a critical article kept in the Collection Olga Signorelli[1] that provides the user with important feedback on the work of Eleonora Duse and about the effective dramatic rendering of the interpretation of the part of the Mother in the staging of *Così sia*. This Linked Data (LD)[2] approach allows the user to identify the relationships between the documents and navigate the archive by performing an analysis with respect to the *body of work*, therefore being able to display all the traces related to a single artistic project and their interrelations.

## Ontologies, Metadata and Frameworks: the case of the Pina Bausch Archives

In 2010, the Pina Bausch Foundation launched the *Pina lädt ein project Ein Archiv als Zukunftswerkstatt* (An Invitation from Pina. An Archive as a Workshop for the Future), with the aim of systematically safeguarding and reordering the legacies of Pina Bausch, creating a database and initiating procedures applicable to the study of the dance history (Wagenbach in Wagenbach and Wirth, 2014, p. 15). Unlike the previous case, for which the website for access and consultation is made from an archival description software, the Pina Bausch Foundation uses technologies derived from the semantic web, as «they enable linking data automatically and create new knowledge through inferencing. Hence, they support exploring and interpreting the archive data according to varying user needs» (Diwish and Thull, 2014, p. 275). In particular, Bernhard Thull – Professor for Knowledge Management and Information Design at the University of

[1] The Collection Signorelli is a sub-fond of Fonds Eleonora Duse and it keeps materials collected by Olga Signorelli (1883-1973), Duse's friend and first biographer, over long years of work and research (Fondazione Giorgio Cini, 2023c)

[2] «Linked Data is a method that allows the dissemination of structured data in a way that can easily interlinked and become more and more usable» (Bountouri 2017, p. 68).

Applied Science Darmstadt (Germany) – has created an ontological model for the Pina Bausch Archives using the ontology FRBR (Functional Requirements for Bibliographic Records) (IFLA, 2009), for which «by associating a performance record with an appropriate entity, the relationships between the entities provide links that can facilitate navigating through the hierarchy» (Lehner, 2014, p. 79). In essence, the result that has been obtained is the *Pina Bausch Archive Ontology*, which

> characterizes persons according to what they did. If a person danced a certain place during the performance of a piece, then she or he is a dancer. If a person took some photographs, then she or he is a photographer. By this mechanism, it is possible to collect the roles of persons according to various entries in the database about their activities. Hence, persons are characterized in two ways: by explicit statements that somebody is e.g., a dancer, and by reasoning about what somebody did. This gives a more comprehensive view of a person (Thull, 2014, p. 63).

In parallel with the structural and modular realization that provides the interconnection between Performance Records and entities, it is necessary to characterize and describe Performance Records as archival resources to be presented on the web. Therefore, the Pina Bausch Foundation made use of Dublin Core Application Profile (DCAP), a standard that «defines metadata records which meet specific application needs while providing semantic interoperability with other applications on the basis of globally defined vocabularies and models» (Coyle and Baker, 2009). This model allowed the Pina Bausch Foundation to describe the documents and identify the structural links between them. Thanks to the Description Set Profile (DSP), which is a component of the DCAP model, it is possible to describe the "structural constraints" so that «it constrains the resources that may be described by descriptions in the description set, the properties that may be used, and the ways a value surrogate may be given» (Nilsson, 2008). In other words, while ontology outlines the structure of relations between entities (people, performances, objects, places) and archive documents (items, objects, resources), the DCAP and its DSP component not only allow the annotation of documents and entities but also allow the definition of structural constraints between them.

To build the server side – then the software and the various components through which to describe and annotate the resources, entities and their relationships – the Pina Bausch Foundation used Next.js, «a framework for building […] interactive, dynamic, and fast web application» based on JavaScript (Next.js, 2023). While the client side, namely the user interface, has been built with react.js, a library of codes also written in JavaScript which allows to create and

combine web components with which the user can interact (React.js, 2023).
All these tools have allowed the creation of a web application that provides an intense interaction with the user. For example, when the user watches the audiovisual recording of a performance, while the video scrolls, the dancers' names on the scene at that time appear on the right. The names are buttons that the user can click to be taken to the page dedicated to that specific dancer (Fig. 3). Of particular interest is also the interaction between the user and the oral sources: also in this case, while the audiovisual recording of the interview flows appears on the right a window that reports the transcript in English of the interview itself, interspersed with clickable buttons that in turn lead the user to the display of other documents regarding the performance or the topic of which the interviewee is talking (Fig. 4).

## "Leading Images" and "Device Archives"

For both the cases analyzed above, the document, its telematic representation and the arrangement within the screen of other elements form an image that allows the user to leave the boundaries of the image itself. In essence, the image and the elements it contains lead the user inside the archive and allow the user to outline the relationships that a single document has with other documents within the same domain. By its very nature a «computer image is frequently hyperlinked to other images, texts, and other media elements. Rather than being a self-enclosed entity, it points, leads to, and directs the user outside itself toward something else» (Manovich, 2002, p. 290). So, the computer image is not static and is linked to other images, a feature that, during the creation of an online archive, allows to link multiple images with each other and then from each image is as if they were set lines that the end user can travel. In this sense, the online archive is a «device", intended as "[…] a skein, a multilinear set composed of lines of a different nature. And these lines neither delimit nor circumscribe homogeneous systems per se – object, subject, language, etc. – but follow directions, trace processes in perpetual imbalance; sometimes they approach, sometimes they move away from each other» (Deleuze, 1988/2010, p. 11).
The image leading the user and the archive as a "device" consisting of a skein of different lines are instances that make the interdependence between one document and another visible and navigable in the context of telematic archiving and access. But looking at the two cases analyzed here, the fluidity of the image and its links represent the nodes of one or more lines that the user can navigate and allow her/him to identify the components of a performance and the relationships between the different traces that derive from it. Moreover, it allows

the user to analyze the performance from different perspectives, especially as a complex artistic project in which more languages and elements converge.

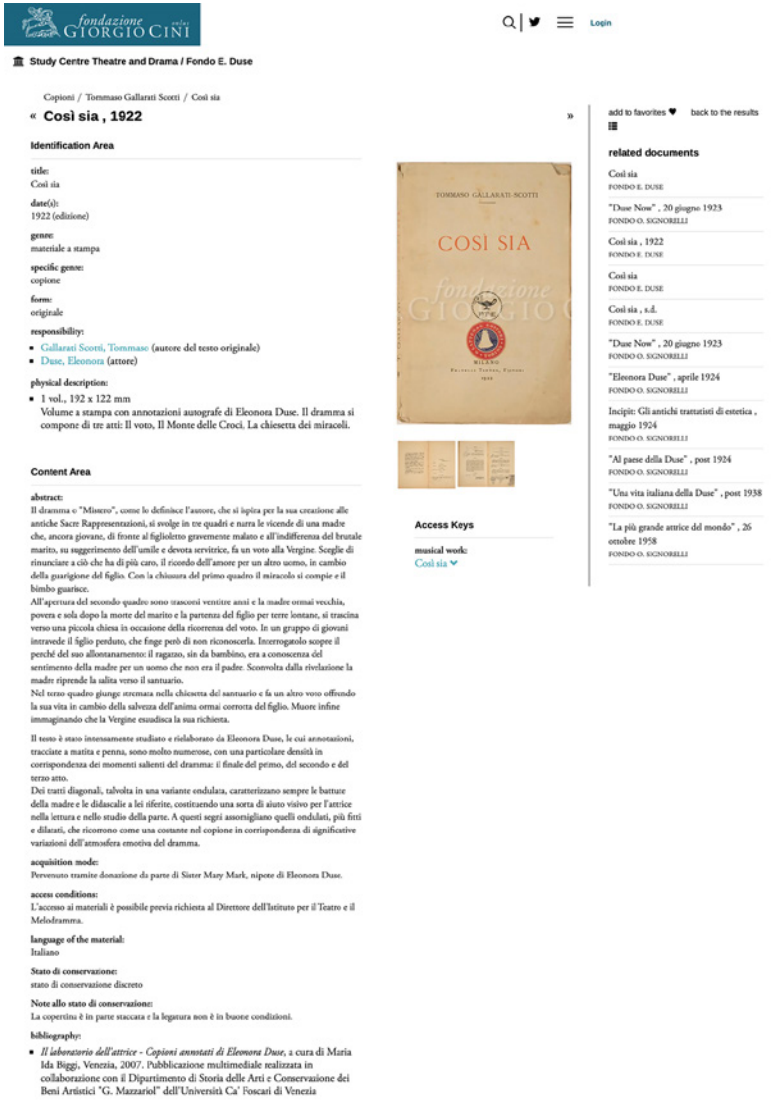


Fig. 1. A screenshot from a page presenting the data and the cover of a dramaturgy annotated by Eleonora Duse.
© Courtesy by Istituto per il Teatro e il Melodramma - Fondazione Cini Onlus (Venice, Italy).

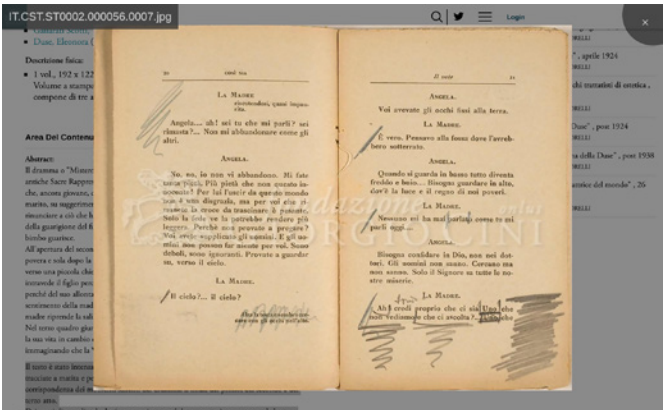


Fig. 2. The interior of Così sia (1922), dramaturgy by Tommaso Gallarati Scotti with annotations by Eleonora Duse. © Courtesy by Istituto per il Teatro e il Melodramma - Fondazione Cini Onlus (Venice, Italy).

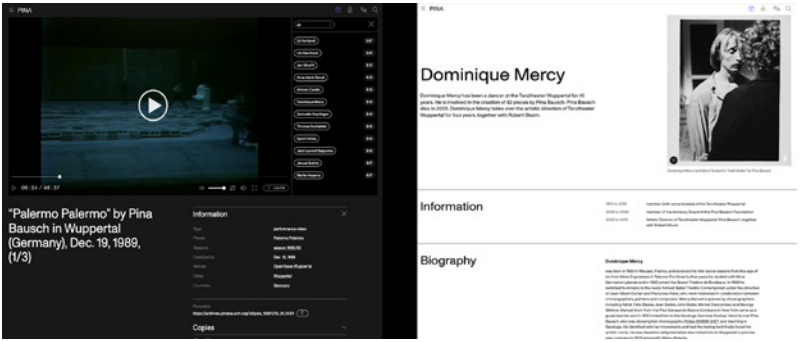


Fig. 3. Two screenshots from the Pina Bausch Archives. On the left side a video of the performance Palermo Palermo shooted in 1989 and next to it a series of buttons that links to the pages of the actors that appear on stage while the video scrolls. On the right side an example of a page dedicated to a single actor. © Courtesy by Pina Bausch Foundation (Wuppertal, Germany).

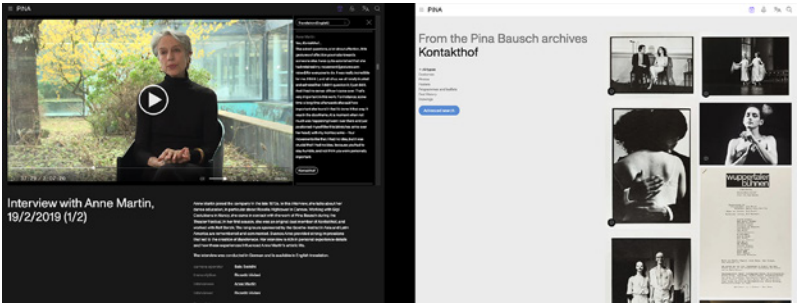


Fig. 4. On the left side a video interview released by Anne Martin in 2019: next to it a translation in English followed by a button linking the interview to the page dedicated to the performance the interviewee is talking about. On the right side an example of a page dedicated to a single performance. © Courtesy by Pina Bausch Foundation (Wuppertal, Germany).

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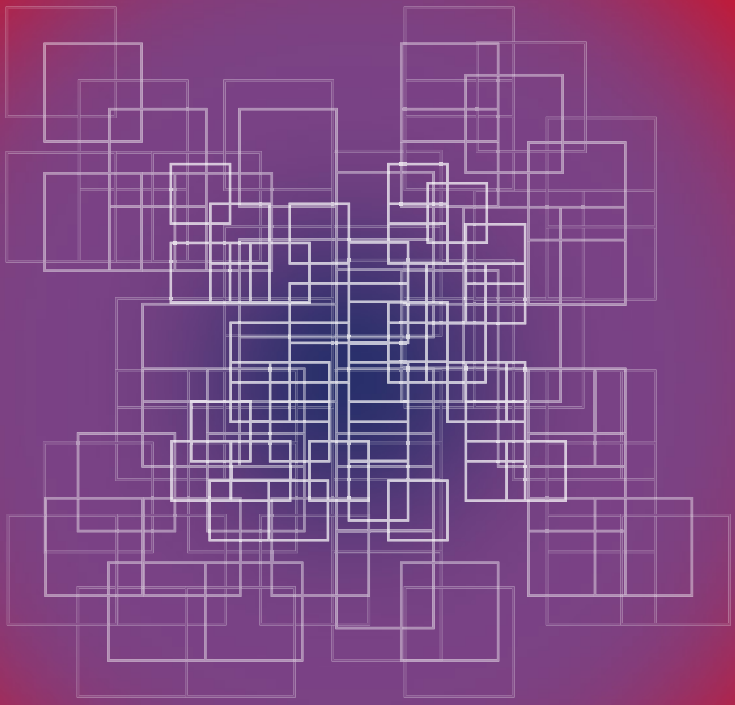

# Multisensory Representation / Visual Perception

# 3. «L'immagine del suono». The Sound Stones by Pinuccio Sciola as a paradigm of visual representation of sound

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## The visualization of sound: origins

The idea of a representation definable as multisensory, relative to a given tangible and synesthetic expression produced by the intersection of different perceptive channels, can be found already from the V century B.C. In the important Aristotelian treatises, *De sensu et sensibilibus* and *De anima* there are several reflections on the phenomenological and philosophical aspects of sound and the sense of hearing, together with hypotheses of declination of the perceptual dynamics of the different senses and their direct interchange. In *De sensu* a possible connection in the dynamics of perception relevant to the sense of sight and hearing is hypothesized:

> The *De sensu et sensibilibus* lacks a specific treatment of hearing: after emphasizing the superiority of this sense and of sight (chap. 1) and after analyzing the latter and its objects (chap. 2 and 3), Aristotle goes on to deal with taste, referring to *De anima* for a reflection on sound and voice. Yet, despite this omission, the *De sensu* provides at least three important insights into hearing sensation, three places that raise different questions regarding sound perception. These are passages in which Aristotle introduces references to sound and music to explain dynamics regarding other sensitive (so in chap. 3, analyzing the origin of colors) or general issues related to perception (Pelosi, 2006).

As Pelosi points out, Aristotle intuits the potential of the expression perceptible by a given sense and usable through a different sense. The discourse that can be deduced through the passage offered by the aforementioned assumptions is expressed precisely in what we today define as synesthesia. In fact, a reference to the translation of a given perception is already mentioned in *De anima*. In an Italian edition of 1551 kept at the Austrian National Library the translation from Greek reproduces:

> Noi udiamo nell'aria nell'acqua et nel fuoco, con tutto ch'il suono sia solamente nell'aria. L'imagine del suono si appresenta nell'acqua e nel fuoco, ma nell'aria s'ode il suono e l'effige del suono. Le onde per questo è che noi sentiamo meglio nell'aria perché il rompimento e le ripercussioni del suono son più forti e più atte e maggiori nell'aria[1].

Image of sound. The Aristotelian quotation offers almost certainly one of the first examples of representation of a sensory translation. An acoustic phenomenon and therefore relevant to the sense of hearing enjoyed in a representative way and therefore perceptible through the sense of sight. What we could define as a difference in meaning, the translation of the acoustic phenomenon into its direct visual representation, is in fact often recovered over the centuries. In the Baroque period a large group of natural philosophers deepens the studies on sound and its empirical and philosophical nature, investigating it from an essentially psychophysical point of view, closed by a circle that includes all the complexity of sound perception linked to the concept of performative representation (Zinno, 2023). In this sense, the treatise offers several examples of visual representation of sound. An interesting example is represented by the engravings accompanying Daniello Bartoli's text *Del suono de' tremori armonici e dell'udito* of 1679[2] in which the sound wave is represented graphically in an intuitive way, in form of waving line. Intuition that in the nineteenth century will find the first scientific evidence, thanks to phonautograms produced by the phonautograph, instrument patented on 25 March 1857 by Édouard-Léon Scott de Martinville, which served essentially to reproduce the sound on a graphic support, in order to study the physical characteristics of the sound wave and to measure its amplitude in this way. It seems clear that the attitude to the visual representation of sound is already present in a relative remote past and accompanies the course of the centuries, touching several scientific fields,

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[1] «We hear in the air in the water and in the fire, with all that the sound is only in the air. The image of sound is presented in water and fire, but the sound and the effigy of sound are heard in the air. The waves for this is that we feel better in the air because the breaking and the repercussions of sound are stronger and more apt and greater in the air» in Aristotele, De Anima, Biblioteca Nazionale Austriaca Edizione 1551 – Bartholomeo detto l'Imperador, Venezia 1551. My translation. The document in digital version can be found at the link: https://www.google.it/books/edition/L_anima/8GxWAAAAcAAJ?hl=itandgbpv=0

[2] Daniello Bartoli, Del suono de' tremori armonici e dell'udito. Trattati. In Roma, a spese di Nicolò Angelo Tinassi, 1679. The document in digital version can be found at the link: https://www.libriantichionline.com/seicento/bartoli_suono_tremori_udito_trattati_1679

from empirical studies on acoustics to today, in which it is directly pertinent to the specific field of studies related to sound art and visual art. Just think of the interesting works of artists such as Marco Donnarumma, Ryoji Ikeda or even Ryoichi Kurokawa that, crossing the boundaries of the technological-digital instance, produce a direct experimentation – between further intentions – on the visual representation of sound.

## What sound? The Sound Stones by Pinuccio Sciola

When we talk about the declination of sound in image – within the contemporary performative scene – the sound sources used as performing subjects are evidently different and produced from different generative instances, mostly classifiable within the two dichotomous indices Technological Sounds/Human Sounds and Artificial Sounds/Natural Sounds (Murray Schafer, 1985).
The sound source placed here as the subject of the design idea is classifiable within the natural sounds and is almost certainly considered one of a kind; it is the sound produced by the sculptures of the Sardinian artist Pinuccio Sciola: the vibrating stones of the Sound Garden (Fig. 1).

Fig. 1. Riccardo Rigo, granted to the author by the Sciola Foundation for esclusive use for this pubblication.

Born in the city of San Sperate in the province of Cagliari (1942-2016) Pinuccio Sciola dedicates his life to the realization of an artistic philosophy in perpetual ferment that turns – after a period dedicated to muralism art – to sculptural expression. His works are exhibited in different places all around the world and located within prestigious exhibition spaces. Since the mid-nineties, the artist moves towards a singular and certainly forward-looking direction, proposing the concrete possibility of generating sound from stone: Sound Stones were born in 1996.
Presented in the municipality of Berchidda in 1996, are exhibited in Germany two years later and subsequently requests and proposals in different countries of the world. In 2003, Sciola collaborated with the architect Renzo Piano who chose one of his Sound Stones for the City of Music in Rome.
The Sound Stones (Fig. 2 and 3) are essentially blocks of basalt and limestone that the artist has worked with carvings to create geometric shapes. Notches produce definite symmetries that allow matter to vibrate and thus emit sound from a certain tactile stimulus. They can be beaten, touched with the fingers, or still stimulated with further stones or with a violin bow (Fig. 4). The result is a distinct sound for each different form of strain. The sounds appear structured and respectively, the density of their frequency, depends essentially on the type of carving. Moreover, the intrinsic structure of the rock, in this case the specific quality of the material of which it is composed, further determines the sound characteristics mostly related to timbre; basalt produces more compact timbral sounds than those produced by limestone that are more melodious.


Fig. 2. Ettore Cavalli, granted to the author by the Sciola Foundation for exclusive use for this pubblication.


Fig. 3. Ettore Cavalli, granted to the author by the Sciola Foundation for exclusive use for this pubblication.

Fig. 4. Riccardo Rigo, granted to the author by the Sciola Foundation for exclusive use for this pubblication.

Pinuccio Sciola's work can certainly accommodate different approaches to reflection. A first approach that we could define here as philological would find a particular assonance, a sort of continuation of intent essentially connected to

the sound nature of stone, a characteristic already discovered in antiquity, and which led to the invention of lithophone (Tagliagambe, 2022). The lithophone (or gong rock) whose Greek root reveals exactly the terms 'stone' and 'sound', is a prehistoric musical instrument; these are stones and rocks of different shapes and sizes that were played by percussion. Sound Stones can therefore be defined as a sort of recovery of humanity's remote past; an attempt to bring the intellect and perception back to an ancestral dimension that in fact affects us indifferently and that belongs to us intrinsically. In this way, Sciola had declined this connection with an ancient mode of perception in a further perceptible sense. This proposes us a further reflection linked to the different perspective in which the artist places matter. As Tagliagambe still points out, Sciola considered stone a natural element only apparently static. Actually, the stone contains «within it the sound of the Universe, absorbed during their journey through it». A sort of container of past and less arbitrarily, of future, considering the potential development, in expressive terms, that the artist realizes through the rocky matter. Sound must therefore be revealed, extrapolated from the real soul of matter, brought out of the same chemical and atomic consistency of which the rock is composed. The touch that Sciola offers to the stone is a revealing touch; it establishes a dialogue with the material that does not impose any constraint but generates sound thanks to the interaction between the two bodies: the stone and the human body.

This allows us to reflect on another aspect, more dichotomous. The Sound Stones make a representative oxymoron concerning their physical configuration. In fact, the dynamics of the relationship that Sciola establishes between man and stone, makes both living instances; sharing becomes active because the rock is dislocated from its condition of stillness. That is, through the work of Sciola, the stone – matter relegated to the instance of immobility – is revealed basically vibrating body. Stone takes on the highest expression of its characteristics of elasticity and flexibility, such as to be able to produce sound, that is, a material instance generated by the unavoidability of movement (Zinno, 2023).

At this point a further consideration is naturally. That is, a precise passage that can be read in a performative key. Sciola's work produces a significant transition from visual work to sound work. This is considered to be subtly complex. Stone, in its primary nature, offers itself as a signifier of a first visual impact. The Sound Stones are monoliths, very similar to menhirs of powerful significance. In addition, they are finely carved, and the geometries revealed by sculptural art double the intelligibility that competes with the sense of sight. But in fact, the Sound Stones produce sound. Therefore, the visual instance gives way to the sonic one. This particular passage is a driving force, a foundation of contemporary performative art. From dance to the multimodal forms of contemporary

theatre, to performance art, the continuous sensory shift represents the starting point of the current conception of the spectacular event: the shared sensory experience. The Sound Garden in San Sperate is thus revealed in the double meaning of theater as a place of vision and auditorium as a place of listening producing an experiential impact in fact greater than the sum of the parts. Not surprisingly, the spectator is an essential part of the spectacular event. As the pianist and composer Luca Urciuolo claims

> the sound in purity does not exist, because who approaches to generate it is the experimenter but also the 'experienced'. The eternal principle of variation makes use of the physiological variables of the human being: who fails is the one who wants to retrace his steps, not being that person anymore[3].

In this sense, Sciola's sound-visual work recovers and doubles the essence of the performing act: actor and user become the same intellect, the same perception, the same reactive body.

## Which visualization? Hypothesis of a research project

Retracing the points of reflection examined so far, it seems deductible that in fact the work by Pinuccio Sciola identifies a movement that shifts the perceptive axis of the visual instance towards the sound one. Considering that this already proposes a first declination of visual perception in auditory, the question that arises is: what impact would an attempt to re-visualize (hopefully graphically) the sound path generated by stone?
The idea of converting sound into a visual instance is certainly not new and has persisted for decades in the contemporary performative panorama. The advance of technologies leads to the creation of the structural mindset that is the basis of creative choice. The interesting passage, compared to the conversion of the sound produced by the Sound Stones in visual instance, could therefore reside in the particular nature of sound production. It has been said that sound is generated by contact with stone and that it depends essentially on different variables. A first hypothetical goal could be, for example, to compare the visual results (generated in this sense by a basic software Pure Data Generative Art) of the sound produced by the same stone played by different people. In this

[3] The fragment is taken from my interview with Luca Urciuolo in the research for my publication Mediterraneo Ben Temperato: l'arte musicale di Luca Urciuolo, currently being written.

sense, the visual impact generated would further strengthen the idea of relationship, identifying – regarding the performative field – the experience as a real performing subject and could provide interesting insights both in the field of sound research and visual art. Of course, the project idea presented here in purely hypothetical form is still at an early stage although not failing to imagine scenarios that go in the direction of neuroscientific experimentation (v. Leandri, 2023) that analyzes the cognitive behavior with respect to certain artistic and/or performative forms (from drawing to the pure fruition of images or sound). In its basic form, the project would foresee in the early stages the attempt to capture the sound, a condition that is naturally essential. Audio recording, sampling, decomposition, and waveform synthesis are the preliminary necessary for the next visual generation of the sound sign. Of course, the idea of a project remains now, in a purely hypothetical phase of analysis of variables. The fact that it seems certain is related to the conscious need to explore the enormous potential of the interdisciplinary intersection capable of generating research connections and expanding potential developments.

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# 4. Educational Metaverse: teaching within immersive environments

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## Introduction

The term "Metaverse", coined by Neal Stephenson in his 1992 science-fiction novel "Snow Crash" (Stephenson, 1992), has become increasingly popular in recent years not only in the technological environment, but also in the public debate. The novel depicted an environment that presented a virtual world accessible through specialized glasses and headphones. The protagonist embraced this immersive experience to detach from the difficulties of his actual life, assuming an alternate existence by embodying an avatar. The core elements of the experience portrayed in the novel align closely with those prevalent in contemporary Virtual Reality (VR) encounters. These experiences plunge us into diverse Metaverses where we now often find ourselves working or engaging with others. The ongoing technological advancements in VR, coupled with the global surge in sales of Head-Mounted Displays (HMDs) over the past decades (ReportLinker, 2023), have significantly increased the accessibility of immersive worlds crafted for the Metaverse, making them available to a wider audience. Multinationals such as Mark Zuckerberg's Meta have chosen to invest huge amounts of capital in the development of virtual environments that are able to reproduce not only the appearance of the real world, but also the sociality between the people who populate it (Quast, 2023). The possibility of coexisting with others in a virtual place easily accessible through HMDs has led to numerous ethical discussions regarding such platforms seen as unregulated and potentially dangerous places for the individual (Kaur, n.d.). However, the Metaverse can be a huge opportunity to restructure the way knowledge is delivered at school and university level by bringing students to share lessons specifically designed to be experienced in immersive environments.

## Educational Metaverse

With face-to-face communication becoming challenging due to the pandemic, activities once limited to offline settings are now being converted to VR, leading to rapid expansion across various fields such as education, healthcare, fashion, and tourism (Kye et al., 2021). The creation of an Educational Metaverse is a direct consequence of the goal of the Metaverse itself, namely the realisation of the "digital twin" of our reality. A digital twin can be described as a precise reflection of a physical process that runs in parallel to the actual process itself. It typically replicates the functioning of the physical process in real-time, maintaining an exact match (Batty, 2018). They facilitate comprehensive data exchange and can incorporate models, simulations, and algorithms that describe the physical counterpart's features and behavior in the real world (Kuhn, 2017). To enhance the perception of real-life experiences, digital twins can be implemented in virtual realities. It is important to note that a digital twin is not an exact replica, as there is always a certain level of abstraction in modeling, and they only represent physical reality with a margin of error (Dembski et al., 2019).


Image 1: The Digital Twin of a Real Lesson in Meta Horizon Workrooms.

Education is a fundamental part of everyone's life, and thanks to the virtual worlds available on Horizon Worlds, Roblox, Rec Room, etc., lessons can be carried out in realistic and fully explorable environments, taking students to learn, as needed, within scenarios potentially from any era or place. The Metaverse, leveraging Extended Reality technologies and the integration of Gamification principles into the learning process, emerges as an optimal realm for immersive and enjoyable learning. These platforms offer a place for experimentation, where students can freely make non-detrimental mistakes (Michael & Chen, 2006), fostering a risk-free environment. Additionally, it effectively addresses emotional and psychological barriers that students may encounter during their lessons, ensuring unhindered progression and engagement (Xu et al., 2021).
However, to successfully create the Educational Metaverse, traditional methods of delivering academic knowledge cannot be solely relied upon, even though they can be replicated in VR environments specifically designed to recreate the same classroom experience for remote students (Zolezzi & Vercelli, 2023). It is essential to develop a new educational approach that consistently engages students in their learning journey and adequately recognizes their accomplishments along the way. For this reason, we have devised an approach that integrates the methodologies of Massive Open Online Courses (MOOCs), Gamification, and Extended Reality (XR), centered around the acquisition of micro-credentials (Hunt et al., 2020) awarded whenever a student successfully completes a course or a short module, demonstrating a thorough understanding of the knowledge imparted.


Image 2: An A1-level Italian lesson in EON-XR.

Gamification is the process of transforming a non-game activity into a game-like experience by incorporating game elements and design techniques to make the activity more engaging. It stimulates cognitive processes associated with fulfill-

ment and provides an additional positive boost to accomplish the task at hand (Werbach & Hunter, 2012). The ultimate goal of Gamification is not to create a highly complex AAA game but rather to devise effective methods that enhance individual motivation towards everyday goals, both in professional and personal contexts (Iacono et al., 2015). Gamification, when combined with Extended Reality technologies (encompassing Virtual Reality, Augmented Reality, and Mixed Reality) (Morimoto et al., 2022), can serve as an additional incentive for students to embrace the instructional methods of the Educational Metaverse. By immersing students in captivating environments, these technologies have the potential to induce a state of flow (Csikszentmihalyi, 2014), making learning activities more enjoyable and mitigating the perceived burden of academic knowledge. Moreover, gaming has been a significant driver of global sales for HMDs in recent years (GetNews, 2020), and adopting a playful approach could be the most effective means to motivate users to invest in VR headsets, which may have been previously hindered by high costs or a lack of motivation for their utilization.

## Educational Content Creators in the Metaverse

The opportunities presented within these virtual worlds also pose a considerable new challenge for teachers aiming to utilize the technologies offered by the Metaverse. In addition to ensuring access to Head-Mounted Displays (HMDs) for optimal immersive experiences, the major hurdle in harnessing the educational potential of the Metaverse lies in adapting educational materials to be effectively delivered in an immersive manner. It requires careful consideration and innovation to seamlessly integrate educational content into the immersive environment of the Metaverse.

Our current research focuses on teaching Italian at the A1 level to Erasmus students enrolled at the University of Genoa. To provide an engaging educational experience, we have utilized the EON-XR platform by EON Reality. This platform enables us to create immersive lessons using 3D models and 360-degree images. Lesson creators can enhance the models with textual files, audio, video, points of interest labels, and interactive quizzes to deepen the study topics. Students have the option to access the lessons via desktop computers, tablets, or smartphones, or fully immerse themselves in AR mode using their smartphones or VR if they have a compatible headset (November, 2021). The lessons can also be accessed through the EON Metaverse Builder platform, providing the opportunity to immerse oneself in a fully-fledged Metaverse. Up to twenty people can simultaneously engage with the lessons, exploring a 3D environment and participating in activities individually or collaboratively. The platform enables the immersive

display of models from various lessons, offering a rich learning experience. Using a pointer, the teacher can highlight points of interest within the created scenarios, replicating the experience of a guided tour while incorporating multimedia content within the activities.

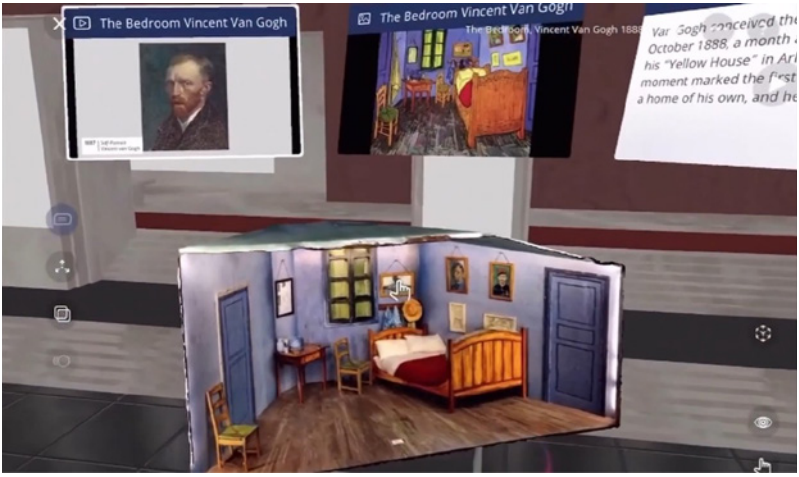


Image 3: Example lesson in EON Metaverse Builder.

The creation of content within a platform like this presupposes the acquisition of skills by teachers that should not be underestimated. EON-XR offers an extensive library of readily available models through a partnership that allows the utilization of models from Sketchfab, a platform where users can upload, view, and share 3D models. However, to have a teaching activity specifically designed for the target topic that the teacher wants to address, it is not always possible to find a perfect model that can be the focal point of the lesson. This means that the teacher will need to personally create the 3D models, which can be a particularly challenging and time-consuming task. Moreover, the reference platform will not only require the teacher to create a single model, but depending on the requirements, they may have to build three-dimensional environments to showcase a specific historical period or a particular location. The Metaverse presupposes the ability to eliminate physical and temporal limitations. However, to ensure that this becomes truly credible for students, it is essential to provide them with an experience that closely approximates the physical and visual interaction they would encounter in reality.
In Web 3.0, teaching online in an effective manner goes beyond simply uploading traditional classroom materials to a course management system. Authors are required to develop educational content in the form of multimedia learning objects, including questions, simulations, and more (Rudman & Bruwer, 2016). The

introduction of the Metaverse can usher in a new phase of e-learning, where teachers will not only need to produce multimedia content but also reconsider the virtual context in which lessons take place and adopt the most effective technology to meet educational needs. Additionally, the creation of collaborative environments will encourage users studying within the Educational Metaverse to form communities of practice and learning (Wenger, 2006). These social groups are designed to generate new, organized, and high-quality knowledge within specific domains of interest. As users adapt to the virtual environments of the Metaverse and explore beyond the confines of the school or university setting, they will have the opportunity to connect with like-minded individuals who share similar interests or passions. Together, they can engage in joint activities, hold discussions, and foster connections, reminiscent of the early days of Web 2.0 when users congregated within blogs. Collaboration among teachers can also be viewed as a community of practice. Sharing experiences and knowledge can enhance the process of creating lessons in the Metaverse, resulting in a gradual and consistent improvement of the content. Both types of communities will contribute to the development of a new culture.

## Conclusions

The necessary foundations for creating a course within the Metaverse that can be perceived as realistic, immersive, or a digital twin of the real-world experience already exist. Current platforms provide the opportunity to recreate a lesson in a virtual environment, transcending limitations of space and time. However, the accessibility of Head-Mounted Displays (HMDs), which are still considered expensive or not widely integrated into daily activities, poses a challenge in maximizing the immersive potential of experiences or simply accessing certain platforms. Nevertheless, their usage is projected to increase in the coming years. The main challenge lies in driving educators to embrace this type of content in the near future, in order to fully harness the potential offered by immersive virtual worlds. The implementation of such technologies could lead to a renaissance of collaborative internet, reminiscent of the early years of 21st-century blogs, but with significantly updated technological capabilities that replicate proxemics and human interaction, creating an even more authentic sense of reality than ever before.

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# 5. Art and rehabilitation. Notes for a methodology for the selection of visual artefacts, functional in paediatric rehabilitation in the age of development

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## The visualization of sound: origins

According to Semir Zeki,

> «Neuroaesthetics was born to understand more about how the brain works, not to say what beauty is, which is an abstract experience. Neurobiology makes it possible to investigate the cerebral mechanisms responsible for what we feel when we observe a beautiful painting, when we listen to exciting music or even in more refined situations, as happens to mathematicians, when faced with the aesthetic pleasure generated by formulas and theorems» (Savino and De Clemente 2020).

The ultimate aim of this discipline is to find scientific answers to the questions that humanistic subjects, such as aesthetics, have always asked. What is art and why does it induce aesthetic pleasure? Why are we attracted to some works while we consider others uninteresting or even ugly? And above all, why is art considered a universal phenomenon that always maintains certain constants, even across millennia and continents? The search for these answers has prompted neuroscientists to investigate the innate and instinctive brain processes underlying perceptual experience, arriving at a first pragmatic cataloguing of a basic set of 'rules' that imperceptibly guide our experience of the outside world. For neuroaesthetics, the perception of a visual stimulus (but also auditory, tactile...) does not produce an exact reproduction in the brain but a reconstruction based on the completion of the perceived data with the data stored by memory. Neuroaesthetics is based on the multidisciplinary nature of the aesthetic experience, that is, that particular psychological moment in which the processing and synthesis of perceptual data meets memory, the observer's expectations, his or her emotional reactions and personal cognitive evaluations, giving rise to the complex system of pleasure during the appreciation

of beauty, in the contemplation of objects, people and situations. This whole attributes to the enjoyment of a work of art a perceptive completeness, which the brain processes through memories, comparing it with the expectations and emotional reactions due to previous experiences, ending the cerebral process with that condition of disinterested pleasure in the contemplation of a painting, a sculpture, a ballet, a musical composition. Aesthetic experience is the result of a harmonically alchemic composition, consisting of continuous education in perception, the influence of innate aesthetic universals, physiological processes due to their cerebral decoding, cultural influences, personal expectations and the psychophysical state of each individual (Savino and De Clemente, 2020).
The most modern and authoritative neuroscience textbooks still describe the functioning of the brain by attributing the identification of visual stimuli to the associative areas of the temporal lobe.
In this region of the brain there are neurons that respond to both shapes and colours, others that only respond to specific complex stimuli such as hands or faces. The discovery that in this same cortical region there are also neurons that respond specifically to particular body or head movements has provided neurophysiological support for the possibility that this is involved not only generically in the recognition of visual stimuli, but also specifically in the recognition of actions performed by others. (Craighero, 2017). These neurons are called 'mirror neurons'.
Giacomo Rizzolatti has been studying for years how the brain responds to the beauty of a work of art thanks to the presence of mirror neurons, Rizzolatti states «...art makes the viewer's empathy stronger, it can set in motion imitative processes and therefore beauty generates other beauty.» (Rizzolatti, 2017). Underlying all this discourse, then, is the concept of empathy. In fact, it is hypothesised that when we come into contact with these subjects we enter into a state of motor resonance, of emotional empathy that arouses particular emotions intrinsic to them. Experiments have demonstrated the activation of certain areas of our brain when we observe beautiful works of art and how this does not happen when they do not adhere to certain canons of perfection. Gallese and the art historian Freedberg's hypothesis confirms that the traces of the artist's gesture on the canvas ignite the motor areas in the viewer that control the execution of the gestures that produce those same images. Thus, when a work of art strikes us with its beauty, areas are activated that analyse the physical structure of the stimulus and others that are sensitive to movement. According to Gallese, «The body is a key component in the fruition of an artistic work [...]. Net of conditioning and cultural mediations, which certainly play a predominant role in the aesthetic experience, there is however a basic empathic response that is triggered in front of images, artistic or otherwise» (Colasanti, 2010).

The aesthetic and emotional components of artistic activities guarantee the opportunity for a reduction in stressful situations and the symptoms and damage resulting from them. An increasing number of scientific studies lead us to consider the association between engagement in artistic activities and the prevention and treatment of mental and physical problems. Artistic engagement, by promoting empathy, social perception and emotional intelligence, influences as a determining variable in the statistical calculation of increased chances of survival. With children, art therapy becomes a playful experience in which they can express themselves freely and bring out feelings and emotions. It facilitates healing, self-awareness and change, but above all it promotes well-being and ensures contact with others through a different mode of communication (Della Cagnoletta, 2018).
In art therapy, it is necessary to emphasise which modes of perception and understanding of artwork in children come into play. In research that considers the influence of the work of art in the child, it is essential to begin by understanding how the child constructs his or her own knowledge. Jean Piaget argues that child development «is not only a continuous process, in that it is governed by the invariant functions of adaptation and equilibrium, but also a discontinuous one, in that as children grow older, structural changes occur that are so significant that they mark real developmental stages (Camaioni and Di Blasio, 2002). According to the Genevan epistemologist, from birth to adolescence, cognitive development goes through four stages: the sensorimotor stage (0-2 years), the preoperational stage (2-6 years), the concrete operational stage (7-12 years) and finally the formal operational stage (12 years onwards). It is essential to consider, in addition to cognitive development, how the child evolves in his or her 'artistic' representations. G.H. Luquet (1969) identifies 4 developmental stages of child drawing: accidental realism, missed realism, intellectual realism and visual realism. Cognition, representation and emotion, these are the three concepts that convey the child's perception, relationship and interaction with physical and pictorial space.
Each of these aspects takes place within a physical space where the child's neuronal and motor action relate to the artistic representation. The physical space must guarantee active interaction for the child. Thanks to our body we can relate to and experience the reality around us and externalize our inner reality, we are able to listen to our sensations, emotions and consequently act by expressing ourselves. There is therefore a relationship between body and psyche, and this is where the work of psychomotricity comes in: a science that aims to understand man in his psychomotor totality by making him aware of his body and its balances in the context of the surrounding reality. Through movement and play, it helps harmonise emotions, the body and certain cognitive aspects. The main objectives of this activity are aimed at a balanced and harmonious development of the child's identity through knowledge and mastery of one's own body and the ability to communicate with space.

In this research, the design of a space for motor rehabilitation for children with tetraparesis and hemiparesis requires careful and accurate planning strongly linked to the design criteria of human-centred design that is functional to man and child. By space we mean the physical place in which the child acts and the space of visual action of the artwork with which the child interfaces. The analysis was divided into several phases, the definition of the problem, the research, the conception and realisation of a prototype, and the selection and implementation of certain design aspects. This process made it possible to identify the functional space for the children to carry out their rehabilitation activities by also referring to the principles of interaction design, also defined as «design of spaces for communication and human interaction». Interaction design focuses on the quality of the user experience to elicit positive responses. As Norman has emphasised for many years, «It is not enough to build products that work, that are understandable and usable, we must also build joy and excitement, pleasure and enjoyment, and yes, beauty into people's lives» (Preece, Sharp and Rogers, 2016).
Perception and emotion come into play during the spatial exploration of the work of art.
Arnheim in 'Art and Visual Perception' discusses the compositional elements of an image and how they are able to communicate different meanings through balance, configuration, form, colour, light dynamism and space (Arnheim, 2000). In the visual space of a work of art, numerous forces act that are able to convey our perception and understanding of the work by stimulating us on a neuronal and motor level. Each element present acquires specific meanings depending on their arrangement, colour, number, combinations, shape, light and shadow, and composition. This set of rules and principles put in relation to the visual, perceptual and motor characteristics of children of developmental age with haemiparesis and tetraparesis have yielded results in outlining useful guidelines for ensuring that the child's exploration of visual and physical space is effective for rehabilitation. These results were evaluated by the medical staff of the Department of Physical Medicine and Rehabilitation of the Giannina Gaslini Paediatric Institute during a meeting at the Paediatric Hospital in Genoa.
Cases of children with hemiparesis have been investigated more thoroughly than cases with tetraparesis.
The term tetraparesis mostly indicates an impairment in all four limbs, although there is never an involvement limited to a circumscribed area that does not affect all other body districts.
For children with severe tetraparesis, preference is given to those works in which the composition must be very simple, based on a purely two-dimensional construction without allusion to perspective references, any reference to figurativism is absent but what must be contemplated is colour, colour is form and space.

The child with moderate tetraparesis is able to adapt more easily to the problems posed by the environment, objectives may include the acquisition of good postural autonomy and functional movement in an upright position.
These children must be stimulated to activate movement by selecting and proposing works that are able to transmit the desire to move and explore space and at the same time are easy to understand. The composition must be built on dynamic lines that favour construction lines converging at least in one point, use of perspective, of depth that induces the exploration of space. The presence of the horizon line is recommended, and the elements present must be easily distinguishable and in small quantities to avoid visual crowding. Each subject present must contribute to the construction of spatial depth through different solutions, e.g. the size of objects, their overlapping, shadows, light, colour.
Children with moderate hemiparesis usually have functionality limited to one half of the body.
For this research, two objectives were identified to rehabilitate an upper limb, the first was to improve the fluidity of the gesture by interacting with the digital artwork, in the second case to stimulate the bimanual movement of the upper limbs.
Hemiparesis is not considered as a single syndrome, but rather as a set of different clinical pictures, depending on the pathogenesis and the time of onset of the injury. Apparently it is a simple pathological form, but in reality it has some complex aspects. Since a child with hemiparesis is capable of reaching the various neurodevelopmental milestones on his or her own, the ultimate goal of any project must aim at the quality of the functional repertoire and not only at the achievement of skills that the child achieves even without help. The characteristics of the hemiplegic child are poor, predominantly single-limb movements. In these children movement is present in different ways, each case will have different difficulties in the gestures of their limbs (Giannoni and Zerbino, 2004). For these reasons, a case of a hemiparetic child with difficulties in the precision and fluidity of gestures of the upper limb was identified. Consequently, the objective was to select the work and propose a mode of interaction with it that could stimulate and help the child in refining these two difficulties.
For the first objective relating to the recovery and improvement of precision and fluidity of gesture, preference is given to those works with a dynamic composition of the work, this dynamism can be traced thanks to oblique construction lines visible or traceable in the work.
As an example, a case study involving the child's interaction with Giulio D'Anna's artwork 'Volo sull'Etna' on a digital medium was presented to the doctors. Observing the work of art, the lines of dynamism appear clear and visible, conveying a sense of movement and displacement to the child. The child, placed in

front of the painting, will initially have to observe, analyse and understand the work of art together with the therapist, grasping the emotions and sensations it arouses in him or her, followed by interaction with the work of art.
The aircraft, the main subject of the painting, will have to be moved correctly by the child following a yellow line that will be created in real time in front of him. If the child moves the plane correctly following the trajectory, the line will be coloured green, if not, it will be coloured red and allow the doctors to understand at what moments and movements the child will have difficulty in performing the gesture.
In general, the characteristics of works of art useful for meeting the above requirements may have elements in space that are either highly figurative or highly abstract. The sign must be clear and concise, it can be iconic, abstract, figurative, indical. Colour must be lively and dynamic.
Light must or may be intrinsic to the colour or there may be plays of light and shadow as long as they are representative of the actions taking place in it and do not cause confusion. In conclusion, every element in the canvas must contribute to the creation of effects of movement and dynamism.
Moving on to the second case study aimed at improving the bimanual and symmetrical gesture, Giannoni and Zerbino write in their manual of infantile cerebral palsy that the difficulty in the bilateral use of the upper limbs can be linked to various factors such as approach behaviours conditioned by the more or less overbearing attitude of the paretic upper limb in flexion, with elbow adduction, and forearm pronation, flexed wrist and deviated by the presence of associated reactions, perceptual disorders, contractures and deformities. The paretic limb may be totally excluded or be involved only in activities performed very close to the child's body, with different compensations of the trunk and shoulder. In children with milder impairment, greater control will be sought, with activity of the paretic limb alone or of both, of reaching and grasping behaviours, also implemented in different postures and on different planes.
The more the child uses both upper limbs on the midline (bimanuality) in tasks/activities of daily life (autonomy, play, relationships...), the more symmetrical will be his behaviour (Giannoni and Zerbino, 2004).
For the interactive activity example, the abstract artwork «Composition II in red, blue and yellow" created by Piet Mondrian in 1930 was chosen.»
The work consists of perfectly symmetrical coloured geometric shapes. Thanks to this structure, it is possible to design a rehabilitation system to stimulate bimanual work between the two upper limbs. The child placed in front of the digital canvas has a screen with opaque geometric figures that serve as guidelines to facilitate the activity, to the side the geometric shapes to be used to compose the work. On an easel beside it is the original artwork that

the child has to reproduce on the canvas. After analysing the scene, the child can choose one geometric figure at a time, after selecting it, it appears in the centre of the screen in full colour, not matted to stand out more against the background of the screen, at which point the child can begin the interaction through bimanual gesture coordinated with the other. The shape can be enlarged, shrunk, with the bimanual and symmetrical work of the two limbs, having identified the correct proportions, the geometric shape must be placed in the right area of the surface.

The general characteristics of these works of art envisage a completely different composition compared to the previous case, the work is preferred that presents a balanced layout thanks to the balancing of the weights of the forms present, the harmonious use of colour, the presence of orthogonal, vertical and horizontal lines that from their intersection give rise to perfect right angles. Harmony rejects any kind of imbalance resulting from dynamic oblique lines. The elements present must be easily distinguishable and detached from the background, they must be abstract, synthetic, traceable to simple perfect and symmetrical geometric figures. The sign must be clear and synthetic. Preference should be given to works that make use of colour in a lively and vivid manner through the juxtaposition of shades that allow each other to stand out, outlined by sharp orthogonal contours and edges. Light is colour, and shadows must be absent.

In this paper, the selection guidelines for cases of children with severe tetraparesis and moderate haemiparesis have been summarised to provide a general overview of the research and the results obtained. The research made it possible to investigate the inclusion of the work of art as an auxiliary integrative means to pursue therapeutic aims in childhood rehabilitation leading to the identification of selection principles aimed at the correct choice of images in relation to the characteristics of the pathology under examination.

The research pathway and the results obtained were presented to the staff of the Department of Physical Medicine and Rehabilitation of the Giannina Gaslini Children's Hospital in Genoa. The artwork selection guidelines for psychomotor rehabilitation in childhood were tested by the medical staff in an initial verification phase.

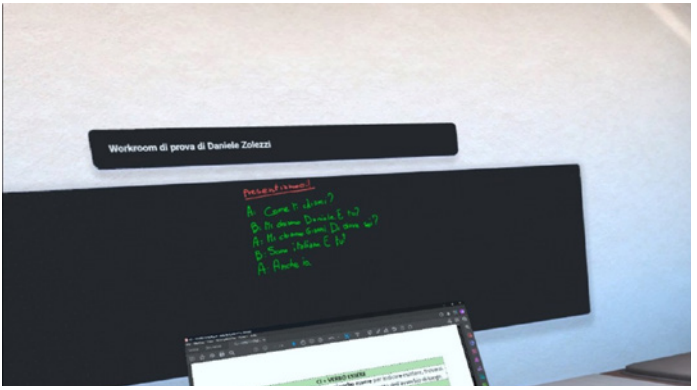


Fig. 1. Beatrice Intermite, Photomontage, Mark Rothko 1960 ca.


Fig. 2. Beatrice Intermite, Photomontage, André Derain, Cypress, 1907.


Fig 3. Beatrice Intermite, Photomontage, Giulio D'Anna, Flight over Etna, 1930.

Fig. 4. Beatrice Intermite, Photomontage, Piet Mondrian, Composition II in Red, Blue and Yellow, 1930.

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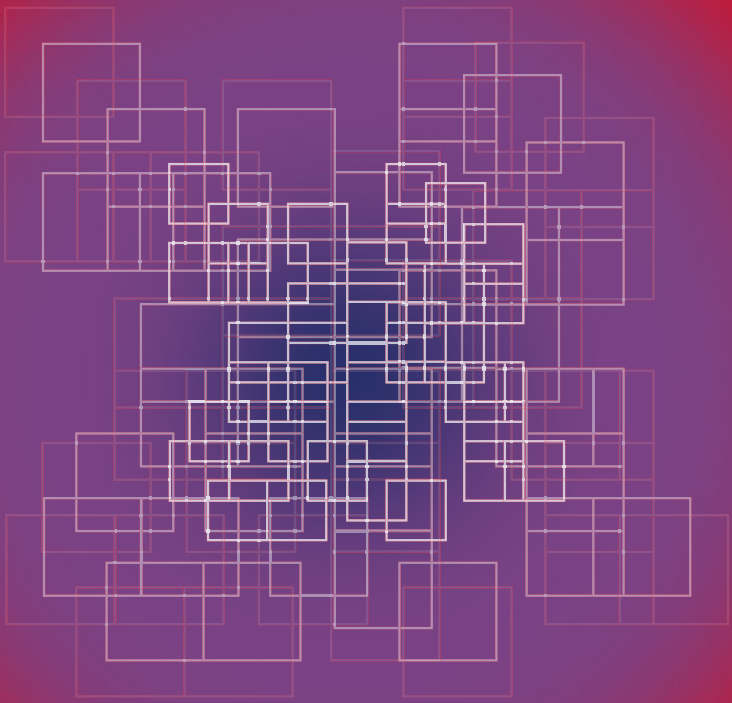

# Visual Expression

# 6. Places of well-being and malaise in young adults: experiences and potential solutions for better living in the community through the Photovoice technique

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## Introduction

In today's rapidly changing and uncertain world, young individuals face numerous challenges that can significantly impact their well-being and future prospects. It is crucial to identify and implement effective strategies that can support and empower youth in navigating and coping with the uncertainties associated with these events, particularly within the educational realm (Commodari, 2020). Finding strategies to assist young individuals in tolerating uncertainty and providing them with the necessary support for their educational journey and future endeavors is of utmost importance (Commodari, 2020).

The places where people live, work, play, and study play a crucial role in their lives, influencing their perception of individual well-being and community (Moser, 2009). The relationship between individuals and their environment offers valuable insights into their well-being and overall quality of life (Rollero and De Piccoli, 2010). Moreover, the places individuals frequent have a significant impact on their psychological well-being, especially among adolescents and young adults (Rania et al., 2022).

To further explore the impact of the environment and empower young individuals, the use of participatory visual methods such as Photovoice has gained prominence (Wang et al., 1994). Photovoice is a participatory action research method that enables individuals to share reflections, strategies, and social support through visual means (Agner et al., 2023). By empowering young individuals through their active participation in documenting their environment and experiences, Photovoice facilitates their voice and agency in decision-making processes (Coemans et al., 2015).

Research has shown that environmental factors, such as the quality of school environments, access to green spaces, and community resources, significantly influence youth well-being and educational outcomes (Dadvand et al., 2015;

Derr et al., 2020; Sun et al., 2019). For instance, a study by Dadvand (2015) found that exposure to green spaces positively correlated with improved mental health outcomes in children and adolescents. Additionally, Derr (2020) highlighted the role of supportive school environments in fostering resilience and positive mental health outcomes among students. Moreover, social support systems and community engagement play a crucial role in promoting youth well-being and resilience (Bronfenbrenner, 1979; Ungar, 2011). Bronfenbrenner's ecological systems theory emphasizes the importance of multiple layers of influence, including family, peers, schools, and community, in shaping youth development. Similarly, Ungar (2011) highlighted the significance of positive social networks and community engagement in buffering the impact of adversity and promoting resilience among young individuals.

Implementing effective strategies to support youth in tolerating uncertainty and enhancing their well-being requires a multidimensional approach. This involves fostering positive relationships and connections, providing accessible mental health resources and support services, promoting resilience-building activities, and creating inclusive and supportive educational environments (Bradshaw et al., 2018; Sancassiani et al., 2015; World Health Organization, 2017).

The integration of positive youth development frameworks, such as the 5 Cs (competence, confidence, connection, character, and caring), has shown promising results in promoting well-being and positive outcomes among young individuals (Lerner et al., 2005). These frameworks emphasize the importance of fostering youth strengths, skills, and positive relationships, while also addressing the challenges and uncertainties they face.

In conclusion, it is crucial to recognize the necessity of finding effective strategies to support youth in tolerating uncertainty and to understand the critical role of environmental influences in their well-being and community perception. By considering the interplay between individuals, their environment, and participatory visual methods like Photovoice, we can gain a comprehensive understanding of the factors that contribute to their well-being and empowerment. Implementing multidimensional approaches that focus on positive youth development and promoting supportive environments can foster resilience, enhance well-being, and support youth in navigating the challenges they encounter.

## Aim

The objective of this research is to investigate the perception of young adults regarding places of well-being and malaise, with a focus on understanding their experiences, challenges, and potential solutions. By exploring the interplay be-

tween individuals and their environment, this study aims to shed light on the factors that influence young adults' well-being and community perception. Additionally, the research seeks to identify strategies and possible solutions that promote individual and community empowerment in relation to these places. Through this investigation, the study aims to contribute to the development of evidence-based interventions and initiatives that enhance the well-being and quality of life for young adults, while fostering a sense of agency and community engagement.

## Participants

The sample consisted of 30 young adults, with 90% of the participants identifying as female. The participants had an average age of 23 years and were residents of the North-Western region of Italy. Convenience sampling was employed.

## Methods and procedures

The present study employed the Photovoice methodology (Wang et al., 1994) as a participatory action research strategy to explore the perceptions of young adults regarding places of well-being and malaise. Photovoice is an art-based research method, developed by Wang and colleagues (1994), which enables participants to use photography as a means of expressing their views (Rania et al., 2019) and for social change (Wang et al., 1994). Furthermore, Photovoice is a tool that allows participants to capture and share their lived experiences through visual imagery, facilitating a deeper understanding of their perspectives and promoting community dialogue and action (Aldridge, 2019). Participants were provided with digital cameras and were asked to capture images that represented their perceptions of places associated with well-being and malaise.
The Photovoice process involved 4 distinct phases:
introductory workshop: The participants received an orientation to the Photovoice methodology, including its objectives, ethical considerations, and technical training on using digital cameras. They were instructed on the principles of framing, composition, and capturing images that convey their personal experiences and perceptions (Wang et al., 1994).
Individual activity: In this phase, the participants embarked on an individual journey of visually documenting places associated with well-being and malaise in their daily lives. They were encouraged to select places that held personal significance, evoked strong emotions, or represented aspects of their physical

or social environments that influenced their well-being (Wang et al., 1994). The participants had the freedom to express themselves creatively through the selection of subjects, composition, and artistic choices in their photographs.
Group Discussions: Following the SHOWed Method the participants engaged in group discussions facilitated by the researchers. SHOWeD is an acronym for 5 questions, which are a stimulus for group discussion and reflection. The five questions are:

- What do you See here?
- What is really Happening here?
- How does this relate to Our lives?
- Why does this condition Exist?
- What can we Do about it?

Participants shared their photographs, discussing the meanings and stories behind the chosen images and exploring the shared experiences and themes that emerged (Harper, 2002). The group discussions allowed for a deeper exploration of the individual and collective perceptions of well-being and malaise associated with the selected places.
Exhibition phase: the last phase consisted of a final event in which what emerged from the group's reflections and the possible solutions identified were shared with the community.

## Data Collection

Participants were instructed to take photographs individually over a ten-day period, focusing on places that held personal significance for them. They were encouraged to reflect on their emotional connection to these places and to consider the factors that influenced their well-being or malaise in those settings. Subsequently, participants engaged in group discussions facilitated by the researchers, where they shared and discussed their photographs, providing contextual information and narratives about their chosen images (Harper, 2002).

## Data Analysis

The analysis of the Photovoice data involved a process of triangulation, integrating the visual images, textual comments provided by the participants about their photographs, and transcripts of the group discussions. This approach enabled a comprehensive understanding of the participants' perceptions and

experiences (Baker et al., 2016). The researchers utilized the software Nvivo 9 (2010) to organize and analyze the data, following the principles of grounded theory (Glaser and Strauss, 1967). Codes, categories and macro-categories, and themes were developed iteratively to capture the nuances and patterns in the participants' narratives and visual representations (Lincoln et al., 2011).

## Results

Analysing the textual and visual data, two macro-categories emerge: places of well-being and place of malaise.
The macro-category places of well-being is mainly declined into: welcoming places, emotionally connected places, and sporting places. Related to the second macrocategory, places of malaise, were defined as: degraded places, places that generate insecurity, and polluted places. In relation to this last macrocategory, as it represents places of malaise, participants reflected on possible solutions, which are shown in Table 1.
Figure 1 and 2 show the two macrocategories with their corresponding categories. Each category is accompanied by a representative photo with caption.

### Places of well-being

The macro-category places of well-being is shown in Figure 1.

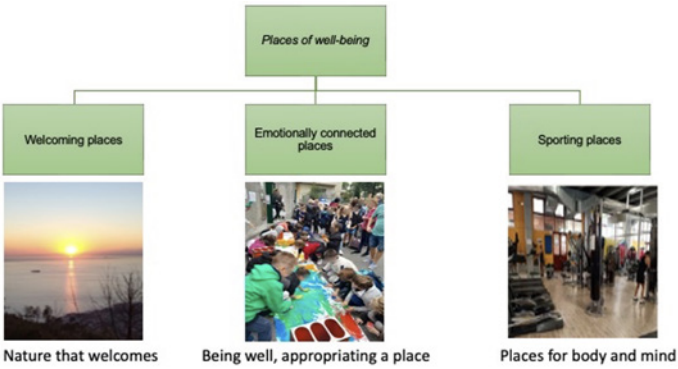


Fig. 1. Places of well-being.

Reflecting on places that generate well-being, participants emphasized those natural, warm-toned environments that reflect specific moods, such as the landscape

shown in the corresponding photo. Among the places that produce well-being are also those connected emotionally, such as the example shown in the related photo, which shows some children intent on coloring the city streets. This depiction conveyed positive and shared emotions in some participants. Finally, there are the sports venues, which the participants identified as a source of well-being. In the photo shown, some young people are immortalised in a gymnasium, a place that for many participants trains both body and mind. Alongside these places, however, participants also reported some places that generate malaise in them.

## Places of malaise

The macro-category of places of malaise, with related categories and photos are illustrated in Figure 2.

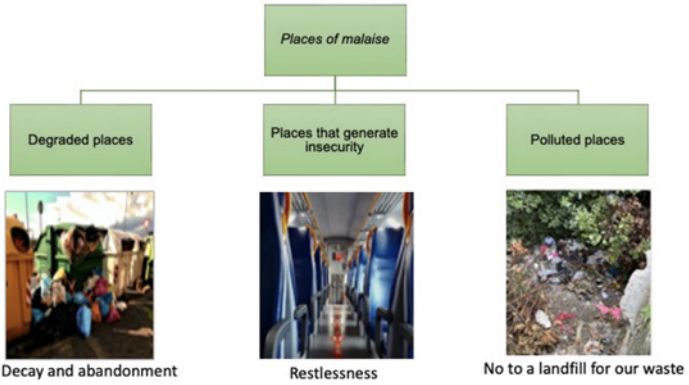


Fig. 2. Places of malaise.

To represent degraded places, the participants chose an explanatory image, which depicts filled bins, representing those urban spaces perceived as dirty and left to neglect. Next to the degraded places, there are also those places that generate insecurity, such as the one shown in the corresponding figure: trains, deserted means of transportation, especially in the evening hours, which generate insecurity in those who have to use them. Finally, polluted places, such as forests covered in rubbish, as in the photo, are reported as a source of malaise, caused mainly by human beings' use of those spaces, which should be protected and preserved by the entire community.
After identifying the places that generate malaise, participants focused on possible solutions, which can be implemented at the individual level, community level or with the support of decision makers.

## Solutions

Below, in table 1, for each category identified as a source of malaise, are possible solutions identified by the participants, with a view to individual and/or community empowerment. The last column, on the other hand, indicates those solutions that need the support of decision makers to be implemented.

| Place of malaise | Solutions | Individual empowerment | Community empowerment | Support decision makers |
|---|---|---|---|---|
| Degraded | Upgrading and cleaning environment to encourage good behavior | X | X | |
| | Experimenting with shared artistic and creative experiences to increase well-being | X | X | |
| Places that generate insecurity | Increased nighttime rides and supervisory staffing | | | X |
| | Shared shuttles for greater sense of safety | | | X |
| | Greater control and self-management of public spaces | X | X | X |
| Polluted places | Sharing best practices for upgrading public spaces | X | X | |

Table 1. Solutions in relation to places that generate malaise.

## Conclusion

From the analysis of the results, it can be seen that the places frequented on a daily basis have a strong power to influence the well-being of individuals (Rollero and De Piccoli, 2010).
Well-being places, in fact, are experienced as spaces for sharing and emotions, which generate resilience and support. These places, therefore, can be a point of reference for young people in building positive relationships, promoting well-being and counteracting uncertainty due to the challenges of everyday life. In addition, the use of the visual method, photovoice, made it possible to stimulate reflection, sharing, and the search for solutions, with a view to individual community empowerment (Ciolan et al. 2017; Rania et al., 2020). The Photovoice methodology offered several potential benefits in this study. First, it enabled participants to actively engage in the research process to actively engage in the research process, promoting their empowerment and agency (Wang et

al., 1994). Furthermore, by facilitating the sharing of reflections in the groups, it allowed participants to make connections, improve their knowledge and soft skills necessary for personal well-being and to cope with the challenges posed by the environment. furthermore, this technique stimulated the promotion of each participant's strengths, which were put into play to find a viable solution for individual and community well-being. Finally, by encouraging participants to use photography as a medium for self-expression, Photovoice facilitated the exploration of personal and collective experiences related to well-being and malaise in their lived environments (Aldridge, 2019).
Finally, the results show how the solutions identified, by stimulating participation and active citizenship, with a view to individual and community empowerment (Cornwall and Coelho, 2007; Percy-Smith, 2015), have a dual function. On the one hand, they make it possible to enhance those places that are frequented by all and that have a significant impact on perceived psychological well-being. On the other, they make it possible to re-appropriate those places by addressing the challenges that generate uncertainty in a more effective and functional way.

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# 7. «Abstract art in your life»: Piet Mondrian's case study

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## Introduction

This paper aims to reflect on the role played by the popularization of abstract art, with the purpose to define abstraction not merely as an artistic style but as a historical condition, namely an unsolved visual issue which interested many generations of artists involved in the reflection about the cultural and visual meaning of the very concept of the 'abstract' (Ferraro and Tamborini 2022). The final goal of this research is to identify and to analyze the role of the so-called 'afterlife' of Piet Mondrian's artworks in the historicization of the famous Dutch artist.
The article is divided into two main sections, followed by some concise conclusions. In the first part, I am going to introduce the issue of abstraction as emblematic language of Modernism and modernity. In the second one, namely the core of my historical analysis, I am going to pay particular attention to Piet Mondrian's typical pattern popularization.

## «Abstract art in your life»

As testified by the success of early avant-gardes during the beginning of the Twentieth Century, the language of abstraction rapidly came to be the preferred voice of Modernism (Dickerman 2012). The latter was meant to be the cultural logic *par excellence* capable to improve and modernize human life both on a cultural and social level: according to those theorists, a new man was meant to populate a new world, built on new architectonical paradigms (i.e., Le Corbusier) and new products, scattered around him that would eventually influence and modify his own lifestyle. Indeed, the popularization of abstraction influenced not only art history, but even broad sectors of international cultural

lifestyles. For the first time ever, a rather hermetic and non-figurative art-style would shortly crowd the homes of the bourgeois middle class. New non-figurative tapisserie would adorn European and American bourgeoisie houses, taking place of Art Nouveau-like intricate and rhetoric decorations (Ferraro 2022); sumptuous old furniture from the past century would soon be replaced by rigid and fascinating Wassily armchairs in black leather and metal tubes[1].

The situation just described is not limited to the post-war context but fully represents a long-term cultural effect, which in many respects persists even today (Wünsche forthcoming), roughly began between the Twenties and the Thirties with the pervasive circulation of abstraction languages, then reinvigorated in their design variations in the immediate post-war period (Karmel 2020). It is not by chance that the French art-historian Georges Roque, in his ***Qu'est-ce que l'art abstrait***, wrote about abstraction not as an artistic style but as a trans-historical category, «and this is the reason why it is so problematic to integrate abstraction within art history»[2] (Roque 2003/2004, p. 93).

In other words, periodizing abstraction is complex first of all due to the persistent programmatic nature of certain positions (Kandinsky, Malevich, Mondrian), which still today carry their clear (and heavy) visual semantics; therefore, it is difficult to draw up a traditionalist historical-artistic narrative divided according to the usual oscillations and alternations between taste, fashion, and critical (mis)fortune.

*Modern Art in Your Life* (1949), curated by Robert Goldwater at the Museum of Modern Art in New York, symbolically constituted one of the first exhibitions that highlighted this profound change in cultural and consumerist terms regarding modernism and the popularization of abstract language in everyday life. The MoMA exhibition was in fact meant to prove that:

> the appearance and shape of countless objects of our everyday environment are related to, or derived from, modern painting and sculpture, and […] modern art is an intrinsic part of modern living. (Goldwater 1953, foreword)

As a result, objects of modernist design or deriving from abstract and/or organic forms were displayed in the MoMA exhibition spaces. Anni Albers' elaborate silk tapestries were thus displayed next to the covers of graphic design maga-

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[1] I support this in the following paragraphs where I will focus on the exhibition Modern Art in Your Life (Museum of Modern Art, New York, 1949).

[2] Since there is not an English translation of Roque's essay I have translated this phrase from the Italian edition published in 2004.

zines in line with the most up-to-date non-figurative languages; the sumptuous lines of the communication receiver *Model S 40* (1946) produced by Raymond Loewy Associates and Hallicrafters Company alongside the geometries of Ben Nicholson's *Relief* (1939), next to Alastair Morton's (1946) and Antonin Raymond's (1941) stylish curtains with non-representational patterns; diagrams of seating components designed by George Nelson for the Irving Harper Associates (1949), in all respects resembling paintings by European coeval abstract artists, juxtaposed with Dan Cooper's iconic *Butterfly Table* (1942) and Charles Eames' seats (1945). (Fig.1) In short:

> Whatever his medium, the designer employs these forms because, as much as the artist, he takes pleasure in them, and his technique is the means of their creation. And it is evident that even traditional materials like pottery, glassware and textiles exhibit the new style. (Goldwater 1953, p. 28)

Therefore, if we were to find a pivotal moment for the 'pop' diffusion[3] of these languages we could place it precisely in the Fifties, years in which the progressive decontextualization of abstract, non-figurative or organic forms was heavily attested, compared to the traditional manifestation places (galleries and museums) to permanently become part of the languages of mass consumption, from popular design to advertising.

Fig. 1. Installation view of the exhibition "Modern Art in Your Life". October 5, 1949–December 4, 1949. Photographic Archive. The Museum of Modern Art Archives, New York. IN423.4. Photograph by Soichi Sunami. @Scala Archives.

[3] Another significant example of this form of abstraction popularization was the Festival Group Pattern (1951) within the Festival of Britain, in which the exhibited works were deeply influenced by new scientific discoveries, like crystallographic and atomic representations, and by artistic suggestions. For further insight about this specific topic see Jackson 2008 and Forgan 1998.

## The so-called Mondrian Brand

> As the artist's concepts are molded by the trends and aspirations of his age, so in turn he molds the appearance of objects around him. The role of a machine civilization in fathering Mondrian's love of the right angle and the clean, flat surface may be argued, but there is no doubt that his work gives form to the passionate concern with mathematical order that made mechanization possible and that the aesthetic of his paintings has entered into our way of seeing the world. When the architect strips his walls of ornament, when the jacket designer makes up his page with a few rigorous lines against large immaculate areas, when the package designer limits his appeal to square-cut letters and a minimum of balanced rectangles, they all share Mondrian's delight in a bold and subtle simplicity. (Goldwater 1949, p. 5).

The extract regarding Piet Mondrian's art is taken from the catalog of the forementioned MoMA's exhibition: immediately one understands the significant relevance of the Dutch master in the collective imagination of the contemporary art system and, with hindsight, it is easy to imagine Mondian's influence on entire subsequent generations of artists.
Today Mondrian is fully considered one of the greatest masters of abstraction not only for the acuity of his theories around the concept of abstract art, but above all by virtue of his representative iconicity – paradoxically Mondrian defended elitist positions during his maturity, firmly against the (inevitable) process of democratization of art through rampant post-war capitalism.
Recently some scholars have dedicated essays and articles to the analysis of Mondrian's reception and influence on contemporary visual culture and, specifically, on the role it had in structuring a canon for the history of abstraction. Of particular relevance for my research is *The Afterlife of Piet Mondrian* (2014) by the professor and art historian Nancy J. Troy. Hers is a very original and innovative contribution about the relationship between abstraction popularization and the modernist visual canon: Troy dedicates extensive reflections to still unsolved historical questions regarding Piet Mondrian, but above all she dwells on the widespread diffusion of that new type of non-figurative representations *a-la* Mondrian in people's daily lives[4]. After the artist's death (1944), Mondrian's works were perceived by the broad public primarily as modernist icons capable, as previously mentioned, of giving new meanings to people's aesthetics and visual culture.

[4] See also Crow (1996) and Holt (2004).

Just think of the circulation of copies of his most famous paintings (*Composition A*, 1923; *Composition with Red, Blue and Yellow*, 1930; *Broadway Boogie-Woogie*, 1943; *Victory Boogie-Woogie*, 1942-44); in this process, remarkable was the role played by his copyist Perle Fine, his colleagues Fritz Glarner, Harry Holtzman, and the Mondrian Estate in managing both the monetary aspects of his artistic production and his legacy as 'an essential master of abstract art'.

The most interesting aspect for our purposes is the analysis of the so-called *Mondriania* which, then as today, crowd bookshops and museum stores of all kinds, which have influenced Mondrian's reception *tout-court* and his mythologisation. Troy defines as 'Mondrian brand' all those cultural and commercial operations that have reinterpreted the iconic abstract forms of the Dutch master in various ways and which clearly bear the artist's visual signature; the scholar focuses primarily on the textile production linked to Mondrian's typical abstract bands and rectangles, but she also mentions the Mondrianesque production during the Sixties and the Seventies – from family puzzles based on Mondrian's works, to hotel furnishing and luxurious villas bearing the well-known forementioned abstract pattern.

We can continue the scholar's analysis regarding the so-called second life of Mondrian's works up to the present day, witnessing that the branding of Mondrian, both as an emblem of a modernist artist and as a producer of effective visual languages, is still far from fading. From plastic tables with the typical four-colour branding – white, blue, yellow and red, and black stripes – to hair conditioners that recall his iconic *Composition A*, comics (think of Glen Baxter's works), books (Lawrence Block, *The Burglar who Painted Like Mondrian*, 1983), computer applications (Loe Feijs, *Mondrian Generators*) and videogames (Price Budget Boys, *Pac-Mondrian*, 2004; Thomas Waterzooi, *Please, Touch the Artwork*, 2021). These examples insist not only on questions regarding the copyright transfer of 'spurious' aesthetic solutions, but first and foremost on the persistence of the idea – entirely modernist – of a certain cultural sophistication in wearing, dressing and interacting with such artistic-abstract products.


Fig. 2. Coverbook of Lawrence Block, Il ladro che dipingeva come Mondrian, Mondadori, Milano, 1985 [ed. or. The Burglar Who Painted Like Mondrian, 1983].

It is important to remember that the progressive branding of Mondrian's works has experienced a peculiar cultural nationalization in the Netherlands which has led to *sui generis* initiatives. Leaving aside the sensational exhibitions dedicated to him over the last thirty years[5], on February 20th, 2021, after about five years of work, the *Victory Boogie-Woogie Tunnel* was inaugurated, a motorway connection between the city of Ypenburg and the Den Haag ring road. The titling of the tunnel was suggested by the Gemeentemuseum Den Haag, a museum institution which houses the majority of the Dutch artist's works in the world. A paradigmatic example of the cultural effect of Piet Mondrian's branding, the colossal road structure – designed following the most up-to-date sustainable

[5] It is useful to remind the great retrospective Mondrian Evolution (2022) organized on the occasion of the 150th anniversary of the artist's birth at the Beyeler Foundation in Basel and the two-person exhibition on Hilma af Klint and Piet Mondrian at the TATE in London (2023) entitled Forms of Life: Hilma af Klint and Piet Mondrian.

building systems – does not contain any reference to the artist's production, with the exception of the large luminous writing at its entrance bearing the words, with a constructivist-like lettering, *Victory Boogie-Woogie Tunnel* (*Let's Boogie in a New Tunnel* 2020, July 7th).
This cultural nationalization of Piet Mondrian is undoubtedly a rhetorical tribute to the artist's memory, but it implicitly testifies to an attitude now shared by many nations towards their own cultural heritage – often rhetorically seen as 'inalienable' and intrinsically linked to the historical memory of this or that country. Just think of the mythologization of the Italian Renaissance, an indicative example not only of an exceptional legacy (so rich and, at the same time, so difficult to preserve) but above all of an intellectual posture that still persists today in many cultural contexts. Reflecting on Mondrian's cultural legacy therefore does not simply mean analysing the canon of abstraction history, its development and its protagonists from a particular point of view, but above all entering straight into the debate about the usage of art history images in view of their contextual consumption.

## Conclusion

On Facebook there are groups of the Dutch artist fans who post on a weekly basis works, pictures and widely used commercial products directly referred to his iconic abstract geometries; at the moment on the well-known social media there are no similar groups referred to other such representative artists, in terms of content and consistency of the members in publishing and updating the 'afterlife' of such famous works panorama. The aim of the Facebook group *Piet Mondriaan* – in Dutch writing, that is no small detail – is obviously ironic and joking, however a simple visit to the group's page allows us to understand how a simple and iconic visual solution, largely historicized and deprived of its avant-garde function over the years, still affects the story of abstraction and its heterogeneous widespread diffusion today.
So far we reviewed many examples of the popularization of Mondrian's works, at times kitsch but significant in terms of cultural consumption; many other artists paid tribute to the Dutchman over the years according to their own sensibilities and methodologies. The recent exhibition *Re-Inventing Piet. Mondrian and the Consequences* (2023), held at the Kunstmuseum in Wolfsburg, is a paradigmatic example of this elaborate citationism, as well as a historical analysis of the Dutch artist's long-term influence on contemporary visual culture, both artistic and of general consumption. On display at the exhibition were, among others, works by Richard Hamilton, Tom Wesselmann, Eduardo Paolozzi, prominent members

of pop art who quoted sketchy compositions by Mondrian in their canvases and collages (respectively *Desk*, 1950; *Still Life #20*, 1962; *Donald Duck Meets Mondrian*, 1967), the conceptual artists and photographers Louise Lawler (*Two Mondrians: At the Art Institute of Chicago*, 1982) and Sherrie Levine (*After Piet Mondrian*, 1983), ironic re-appropriations by Sylvie Fleury (*Mondrian Dress Rack*, 1993/2016)[6] (Fig. 3) up to the most recent years, with Hiroshi Sugimoto's touching installation *Glass Tea House Mondrian* (2014) or Thomas Moore's *Mondrian Mobile* (2018) – an elaborate remixing of the Dutch artist's style and of Alexander Calder's *Mobiles* series, which had already been reinterpreted in a scenographic-advertising manner in the 1950s[7].

Fig. 3. Sylvie Fleury, Mondrian Dress Rack, 1993/2016, three Mondrian dresses, three clothes racks, three hangers, dimension variable (225 x 300 x 160 cm). Karma International, Zurich. Photo credits: ©Sylvie Fleury studio.

[6] During the exhibition of 2023 Mondrian Boots (1992) and C'est la vie! (1993/2013) have been displayed – not Mondrian Dress Rack. The meaning of the artistic re-appropriation by Sylvie Fleury was indeed similar.

[7] This is the case of the Displa-Mobile (1953), a sophisticated scenographic-commercial display designed by advertisers and graphic designers Sol Berger and Frederick Amour in order to attract consumers; the 'abstract' forms of the Displa-Mobiles turned out to be very faithful replicas of Alexander Calder's Mobiles. See Mobiles Give Advertisers a New Medium, 1953, February 28th. Displa-Mobile is also mentioned in Taylor 2014.

The insistent citationism of artists 'following' Mondrian seems not only to pay homage to him but above all to transform his iconic pattern into a metaphorical medium, which – thanks to its communicative effectiveness – can convey the poetics of individual artists; in this case we are faced with a sometimes paradoxical case of 'artist-as-medium' that emerged, not by chance, through the dialectic between popular and contemporary art. As I previously mentioned, this case study constitutes further confirmation of the importance of a new iconology for abstract images with the specific aim to investigate their ontological status and their pervasive circulation in intermedial terms (Purgar 2022).
In conclusion, as the German critic and curator Friedrich von Borries recalls on the sidelines of the exhibition at the Kunstmuseum in Wolfsburg:

> the fact that pure art is contamined by popular culture and vulgar capitalism is also a form of liberation. Mondrian's claim to a mystically charged, elistist design of the world is democratically recoded in capitalist appropriation. Not the "new human" is created, but rather gray everyday life is made a bit more cheerful – thanks to red, yellow, and blue on hotel facades, cabinets, cocktail dresses, and hairspray. (von Borries 2023, p. 207).

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# 8. How to Interpret a Phototext: The Books by Suzanne Doppelt

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## Introduction

Suzanne Doppelt, born in 1956, has evolved over the years from being a teacher to becoming a prominent figure in the realms of photography, literature, and editing. Her influence in contemporary French poetry spans two decades, during which she has authored more than ten books and played a pivotal role in editing various literary publications. Additionally, Doppelt has exhibited her artistic creations, including her plastic and photographic works. Notably, the Centre International de Poésie de Marseille (CIPM), an international poetry center located in Marseille, recently curated an exhibition titled "Que devient une image dans un champ électrique" ("What Becomes of an Image in an Electric Field"), dedicated to her work.

Among Doppelt's extensive body of work, her predilection for the "phototext" stands out. This term, often used by researchers, refers to works that seamlessly integrate text and photographs, offering readers an intermedial reading experience. In phototexts, text and photographs are interdependent and jointly construct the work's meaning through their interaction and sometimes even their confrontation. While the Anglo-Saxon academic tradition typically employs the term "photobook" (Parr and Badger, 2006), more recent French and Italian scholarship prefers "photoliterature" or "phototext" - in Italian, "fototesto" (Carrara, 2020) and in French, "phototexte" (Foucher Zarmanian and Nachtergael, 2021).[1] It is essential to note that Suzanne Doppelt's work does not exist in isolation.

[1] The word « phototexte » comes from the larger « iconotexte », proposed by Alain Montandon (dir.), Iconotextes, Ophrys, 1990, which referred to works that proposed a double reading-experience, visual and text-reading.

French literature boasts a rich tradition of phototexts, further supported by an active contemporary production. This phenomenon can be attributed, in part, to the dual talents of many French writers who are also accomplished photographers. In this study, I will explore how two books by Suzanne Doppelt exemplify the vibrant tradition of French phototexts. These books also provide an insight into the distinctive reading experience they offer, characterized by a unique and open structure that combines text-reading and image-reading.
This monographic study serves as an exemplar of the research conducted by the team from the University of Genova, which focuses on the poetic aspects of phototexts, in the context of the PRIN 2020 "Fototesti: retoriche poetiche aspetti cognitive" ("Phototexts: rhetorics, poetics and cognitive aspects"). It contributes to a deeper understanding of the intricate relationship between text and image within this genre, shedding light on the multifaceted world of the phototext in contemporary literature. The working axes indeed encompass, on one hand, the aesthetic dimension of phototexts (the creative processes), and, on the other hand, the historiographical dimension (the tools employed by authors to address traumatic themes), and finally, the media dimension, namely, contemporary phototext reading practices characterized by a certain complexity in page layout. In the case of Suzanne Doppelt's books, we are particularly interested in how the author addresses and transcends the anxiety surrounding the destruction of the immediate environment and biodiversity.

## Presentation of the books

The two books that I would like to study in this paper are two contemporary works, published in 2007 and 2008. Both aimed to explore the human's position within its habitat, and establish an inventory of the world: *Le monde est beau, il est rond* (*The world is beautiful, it is round*) (Doppelt, 2008) and *Le Pré est vénéneux* (*The meadow is poisonous*) (Doppelt, 2007). Indeed, "Le monde est beau" expresses wonder in the face of physical reality, while "Le Pré est vénéneux" suggests its potential danger.

## Editorial Context

*Le Pré est vénéneux* and *Le Monde est beau, il est rond* represent Suzanne Doppelt's second and third collaboration with the respective publishing companies involved. *Le Pré est vénéneux* was published in 2007 by P.O.L., a relatively young publishing company but an esteemed authority in the contemporary French poetry realm. Prior to this, Doppelt had already published works with P.O.L., in-

cluding *Totem* (2002) and the diptych photobook *Quelque chose cloche* (2004). Additionally, as a photographer, she collaborated with the writer Anne Portugal on *Dans la reproduction en 2 parties égales des plantes et des animaux* (1999). *Le Monde est beau*, il est rond, on the other hand, was published by Inventaire/Invention, a project that resembled more of a multimedia creation initiative than a conventional publishing company. This project was active between 2000 and 2009. It is noteworthy that despite the distinct effective and symbolic statuses of these two publishers, both books present a closely aligned poetic project and a very similar iconotextual device: photographic "vignettes" representing objects that are challenging to identify beforehand, with a focus on blurred subjects or fine-grained close-ups. Therefore, it is highly likely that this structure was a deliberate and meticulously crafted choice made by the author herself, who is responsible for both the texts and photographs, rather than being the result of editorial layout constraints or the preference of a collection director. Furthermore, within each editorial production, Doppelt's books markedly stand out from those published by other authors.

## Phototext layout

*Le Pré est vénéneux* delves into the micro-world of a meadow, from the perspective of its inhabitants, including animals, insects, vegetation, and perhaps even humans. The book alternates pages of text, without illustrations, with pages featuring a photographic montage on the right-hand page, and a sentence underneath. These sentences can either extend the narrative from the preceding page, serve as micro-poems, or function as captions for the collage displayed above them.

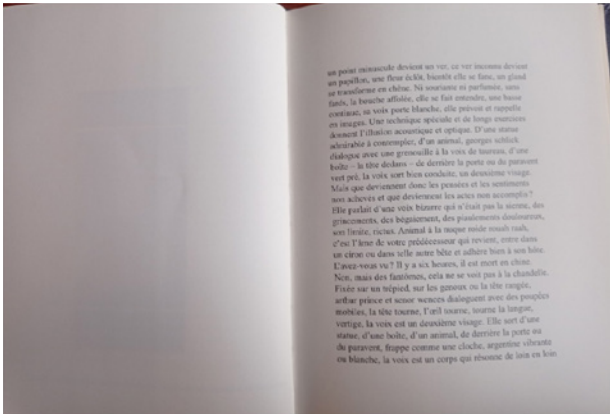


Fig. 1. Le Pré est vénéneux © P.O.L. 2007.

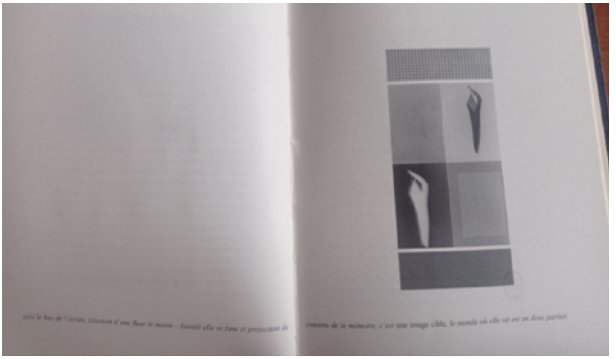

Fig. 2. Le Pré est vénéneux © P.O.L 2007.

*Le monde est beau, il est rond*, on the other hand, revolves around a series of "vignettes," small illustrations that repeat and combine themselves in an increasingly intricate manner. Each small square illustration symbolizes a category of objects or subjects in the world, as explained in the final catalogue: "plants," "animals," "faces," "water," "trees," "materials," "party," "sculpture," and more.

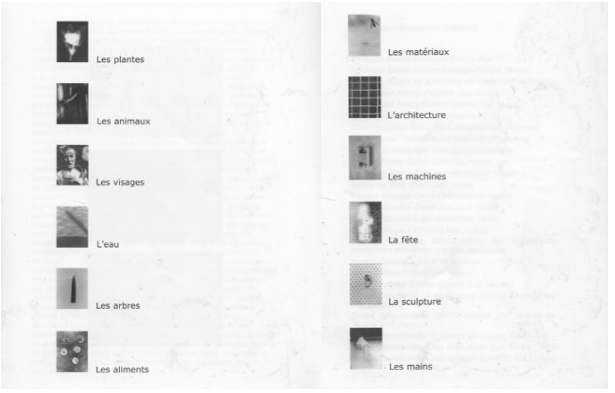


Fig. 3. Le Monde est beau, il est rond © Inventaire/Invention 2008.

The "vignettes" serve as the starting point for an encyclopaedic, though poetic and often abstract, description of unfamiliar places, while the descriptions intentionally disrupt conventional reading habits in several ways.
Firstly, both the texts and the images represent ambiguous objects whose scale is unclear; they could be infinitely small, infinitely large, or even of life-size scale. Moreover, it remains uncertain whether this is a work of fiction or a poetic documentary description of a real place.

Secondly, the connection between text and image is far from obvious: Is the text a description of the image, or of another place? Are the echoes between text and image simply products of the reader's imagination? Do they describe geographic or inner landscapes? Both books present themselves as ironic encyclopaedic works, constructing a descriptive image of a blurred and unclear world that prompts readers to reflect upon their immediate surroundings. In a 2015 article, Pascale Borrel wrote that

> The place to which these works implicitly refer is a space of conception, appearance or fabrication of representations of the world; it is a space whose text and images evoke enclosure and the flows, the energies that it concentrates (Borrel, 2015, p. 179).

I aim to demonstrate that the particular phototextual mode of reading is key to understanding the meaning of these two books.

## The Role of Visuality and creative Reading

I would like to examine the details of a page from *Le Monde est beau* in order to illustrate the artistic possibilities that phototexts can offer. *Le Monde est beau* is presented as a book with unnumbered pages within which a narrative unfolds, resembling an extended prose poem. Initial markers are absent, as are capital letters. The impossibility of identifying the beginning and end of sentences confers an ambiguous status upon each page. Are these independent poems, or part of a longer poem? This question is intimately linked to the presence of photographs. Indeed, the photographs change with each page, albeit following a progressively amplified arrangement based on the same vignettes. The presence of new photos on each page, or at least a consistently different arrangement, introduces variety and serves as a guide for the reader to navigate the volume. The reader is invited to approach each new page with fresh eyes and to juxtapose the text with previously unseen images.

In practice, the reading mode proposed by phototexts differs significantly from that of unillustrated texts or texts in which images serve as mere illustrations, meaning they merely repeat what the text conveys. In the case of artistic propositions like those of Suzanne Doppelt, the image never merely repeats or illustrates the text but engages in a complex dialogue with it, allowing each reader the freedom to interpret it in their own way.

The particular page, from *Le monde est beau, il est rond*, that I would like to study from a closer perspective, proposes a reflection on vision and visibility.

First of all, it evokes the eyes and a whole metaphorical play of images (in the

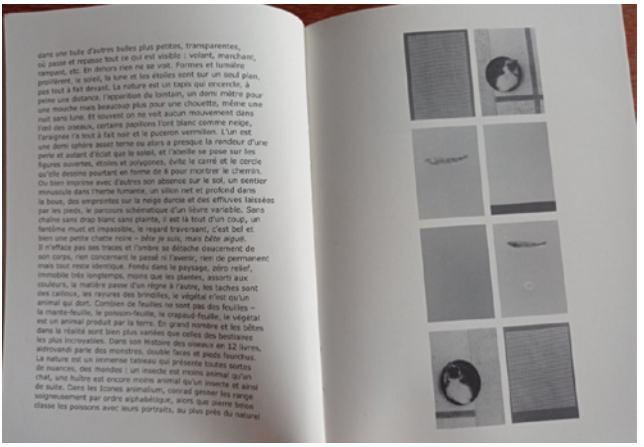

Fig. 4. Le Monde est beau, il est rond © Inventaire/Invention 2008.

text) around the roundness of the eye, the various worlds that flow under the eyes of various animals:

> souvent on ne voit aucun mouvement dans l'œil des oiseaux, certains papillons l'ont blanc comme neige, l'araignée l'a tout à fait noir.
>
> (Often you can't see any movement in a bird's eye, some butterflies have it as white as snow, the spider has it completely black.)

Suzanne Doppelt's theme here is how the gaze moves: the eye movement forms the basis of the experience offered by the book, and in particular of the page in question.

For the reader, in fact, this sentence is a direct echo of the two mirrored vignettes in the top right and bottom left, ironically depicting – not a bird, nor a butterfly, nor a spider – but a kitten in a round shape (kitchen dish? window frame?).

The reader's eyes move from the text to the vignettes, and from one vignette to another, because the mirror game also includes variations – it's not exactly the same photo, raising questions - is it the same kitten? Are the scenes the same? – and a circular visual and interpretative movement: the eye and the imagination move from text to image, to another image, to the text, in a totally free way.

Second, later in the sentence, the text seems to refer more expressly to the 'vignettes' on the right and invite one to 'read' them together with the text:

> un fantôme muet et impassible, le regard traversant, c'est bel et bien une petite chatte noire.
>
> (a mute and impassive ghost, with a piercing gaze, is indeed a little black cat.)

seems to refer to the photo of the sleeping cat, which is, however, not a black but a white cat. This simple, minimal distortion nevertheless opens up a space for questioning the supposed link between text and image, and also creates an ironic complicity between the poet and the reader. The same can be said of the other vignettes. The sentence segment:

> la matière passe d'un règne à l'autre, les taches sont des cailloux, les rayures des brindilles, le végétal n'est qu'un animal qui dort.
>
> Matter passes from one kingdom to another, stains are pebbles, stripes are twigs, the plant is only a sleeping animal.

invites us not only to look again for references in the photos on the right-hand page (the two photos representing a horizontal line), but also to reflect on the iconographic status of the photos. It establishes a connection of equivalence between the visual elements "spots" and "stripes" and the tangible objects "pebbles" and "twigs." This prompts a profound question: Is reality made up of the tangible entities of the mineral and plant kingdoms, or of pure geometric forms? This perspective can be thought of as a graphical interpretation of the world.
The latter part of the passage, "the plant is only a sleeping animal," extends beyond the recurring reference to the vignette featuring the kitten. It asserts a fundamental unity between the animal and plant kingdoms. By using a restrictive phrase, it deconstructs the implicit hierarchy that often places animals above plants, thereby advocating for a holistic perspective on all living beings. At the same time, the text challenges the notion of representation of the pictures, suggesting that they do not represent what we think they do. The reader is thus invited to a dynamic examination of the page: moving back and forth between text and images, as well as between the images themselves. On one hand, the layout encourages the reader to establish connections between these elements, while on the other, the deviations and alterations mentioned earlier prompt one to question the nature of these relationships. Should we understand that the images complement the text? Or do they correct the text? Which discourse holds a higher claim to truth, the text or the photos? Is the "real" cat the black cat mentioned in the text or the white cat in the photo? The fragmentary and abstract nature of the images and their arrangement also invite an active and concerned reading: Are we dealing with pure geometric play, or

does the arrangement follow a logical, narrative[2], or metaphorical order? Does the iconographic montage also constitute a form of graphical poetry?
Therefore, the book enables a reflection on the status of images, poetry, and the movement of our gaze. One can consider that Suzanne Doppelt's works offer strategies for phototextual reading, guiding the reader while also allowing them to explore the potentialities of the structure. In a 2022 interview, Suzanne Doppelt provided intriguing insights into her unique approach to thinking about the relationship between text and photography, always with her playful and metaphorical style.

> voilà encore un espace intermédiaire où se tenir, entre le texte et l'image, les deux louchant l'un vers l'autre mais conservant leur distance, là se jouent une forme de tension, des renvois, une temporalité particulière, un voisinage qui définit d'autres niveaux de sens ou de non sens, un système d'échos, dans le texte clignotent des images et dans les images se lit du texte et éventuellement un récit supplémentaire, un récit muet à sa façon si on les considère, ces photographies, comme une sorte de petit clip. Peut-être ont elles en outre pour fonction de me donner l'illusoire réconfort d'un dédoublement (Doppelt, 2022).

> Here is yet another intermediate space to inhabit, between text and image, both glancing at each other yet maintaining their distance. Here, a form of tension is at play, along with references, a particular temporality, a proximity that defines different levels of meaning or non-meaning, a system of echoes. Within the text, images flicker, and within the images, text is decipherable, possibly even an additional narrative, a narrative that is silent in its own way if one considers these photographs as a sort of small clip. Perhaps their function is also to provide me with the illusory comfort of a duplication (Doppelt, 2022).

In conclusion Suzanne Doppelt starts from the habits of the contemporary reader, constantly exposed to the reading of commercial phototexts that are always in front of us, such as advertisements. She casts an ironic and playful gaze on these habits, and on "conditions and uncertainties of visual perceptions" (Borrel, 2015, p.191). By small but very efficient means, she subverts them, introducing a more active and playful way to "read" the images, or even to co-create the sense of the phototextual layout, which allows us to reflect on our management of visibility, both in text and photos.

[2] On the example page provided, one could imagine a short graphic narrative, for instance, following the cat's gaze as it watches a feather slowly falling.

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*Collana* **Visualità**

01. *Storie di visualità*, a cura del Comitato di Gestione del Centro Interdipartimentale sulla visualità (E. Bistagnino, E. Bricco, F. Bracco, A. Di Biagio, G. Volpe), 2021; e-ISBN (pdf) 978-88-3618-069-1.

02. *Vicoli e Ruelles: rappresentazioni dello spazio urbano nel fumetto tra Italia e Québec / représentations de l'espace urbain dans la bande desinée entre l'Italie et le Québec / representations of urban space in italian and québécois comics*, a cura di / dirigé par / edited by Johanne Desrochers, Anna Giaufret, Ferruccio Giromini, con la collaborazione di / avec la collaboration de / with the collaboration of Elisa Bricco, Franco Melis, Greg Nowak, Gloria Viale, 2022; ISBN 978-88-3618-119-3, e-ISBN (pdf) 978-88-3618-120-9.

03. *Storie di visualità 02_2022. La visualità all'intersezione delle discipline umanistiche e tecnologiche*, a cura del Comitato di Gestione del Centro Interdipartimentale sulla visualità (E. Bistagnino, E. Bricco, F. Bracco, A. Di Biagio, G. Volpe), 2022; e-ISBN (pdf) 978-88-3618-195-7.

04. *Visuality: a crossroad between humanities and technologies*, a cura di Gualtiero Volpe, 2024; e-ISBN (pdf) 978-88-3618-262-6.

05. *Storie di visualità 03_2025. Tra ricerca e partecipazione*, a cura del Comitato di Gestione del Centro Interdipartimentale sulla visualità (E. Bistagnino, E. Bricco, A. Di Biagio, N. Rania, G. Volpe), 2025; e-ISBN (pdf) 978-88-3618-316-6.

06. *Visuality: from research to public engagement*, a cura di Fabrizio Bracco, 2025; e-ISBN (pdf) 978-88-3618-324-1.

**Fabrizio Bracco**, Associate Professor of Work and Organizational Psychology at the University of Genoa, teaches in several course like Psychology of Work (Media, Communication and Society), Cognitive Ergonomics (Digital Humanities), Psychology of Work and Organizations (Psychological Sciences and Techniques), Risk communication and perception (Engineering for Natural Risk Management).

This volume illustrates the themes and lines of research presented in the context of the third ciVIS (interdepartmental center on VISuality) meeting which was held on May 16, 2023. The seminar day was entitled "*Stories of visuality: between research and participation*". The objective of this event, in continuity with previous editions and the aims of the center, was threefold: (1) to present and discuss stories of visuality, research and participation starting from the experiences shared by the members of the Center, (2) to identify areas of application and participatory effects on the territories and with the territories, (3) to stimulate new collaborations between social disciplines, humanities and technology to be developed within the Centre.

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