

Springer Tracts in Civil Engineering

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# Contemporary Heritage Lexicon

Volume 1



Springer

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Dedalus-Acervo-IAU



93000007581



 Springer

# Preface

About our time today:

*[...] La mémoire est la vie, toujours portée par des groupes vivants et à ce titre, elle est en évolution permanente, ouverte à la dialectique du souvenir et de l'amnésie, inconsciente de ses déformations successives, vulnérable à toutes les utilisations et manipulations, susceptible de longues latences et de soudaines revitalisations [...]. Parce qu'elle est affective et magique, la mémoire ne s'accommode que des détails qui la confortent; elle se nourrit de souvenirs flous, télescopants, gloubaux ou flottants, particuliers ou symboliques, sensible à tous les transferts, écrans, censure ou projections (NORA, 1984, p. XIX).<sup>1</sup>*

Through a spectrum of different approaches, this publication proposes to explore the contemporary lexicon of cultural heritage in architecture, engineering, and related areas in ample and significant ways. They are presented as a contribution to preserving the past (re)thinking about the present and designing the future. This compendium contains texts by authors from seven countries: Argentina, Brazil, Spain, Italy, Iran, Portugal, and the United Kingdom/in which they share their perspectives on heritage and its specificities.

From a multidisciplinary perspective, the publication seeks to unravel the complex relationships between creativity, technology, and sustainability within the context of cultural heritage. The book does not limit itself to tangible heritage but also explores aspects of intangible heritage, promoting a holistic understanding of the influences that shape cultural legacy. The collection offers a wide variety of texts, including detailed analyses of iconic historical works and exploration of the work of contemporary architects. In addition to these thematic axes, the publication covers research on the latest technologies, parametrization, digital modeling, augmented virtual reality, simulation, and artificial intelligence. Innovative concepts such as circular economy, circular design, and contemporary circular heritage emerge, further expanding the scope of discussion.

Cultural heritage, more than just a mere collection of artifacts, serves as a repository of knowledge, where perception and cognition of space foster a sense of

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<sup>1</sup> NORA, Pierre. Entre Mémoire et Histoire. La problématique des lieux. In: **Les lieux de mémoire**. I La République, Paris, Gallimard, 1984. p. XVII–XLII.

identity and belonging within communities, ensuring the transmission of cultural values, traditions, and memories to future generations.

This publication aims to examine the various facets of preserving this heritage, considering the innovations provided by technological advancements and the commitment to documentation, including the initiative of the Ministry of Cultural Heritage (MiC) with the project “Italian Architecture of the Second Half of the 20th Century,” featuring an online platform for researchers and non-specialists.

Following the timeline of history, in Antiquity and the Middle Ages, materiality and form were predominant in building construction. In the subsequent phase, during the industrial and post-industrial eras, the debate on form persisted, now enriched by studies and practices related to new structures and materials. From the modern era onwards, attention intensified on geometry and construction processes, emphasizing the fundamental triad—structure, form, and function. In the contemporary scenario, we are experiencing revelatory moments of technology in design and construction processes; the construction dimension and the conceptual sphere manifest their presence. This impact is visible in mathematical applications using algorithms and software and in the ongoing debate on introducing artificial intelligence in architecture and engineering.

Contemporary architecture, in this twenty-first century, manifests a dynamic interaction between tradition and innovation, between past and future. In this context, the publication retrieves historical memory from the perspective of current reflections, including the study of the restoration of the Monastery of the Four Crowned Martyrs in Rome and the Church of Santa Maria Goretti in Mormanno (Italy). Several texts anchor their references to the transition between modern and contemporary architecture, as evidenced by the analysis of the bus station in Alicante (Spain). Others revisit postmodern architecture, highlighting the works of Paolo Portoghesi and Vittorio Gregotti (Marbella Swimming Pool, Spain) and the contributions of Rem Koolhaas (Casa da Música, Portugal). A phenomenological perspective also examines the works of Eduardo Souto de Moura.

Rapid technological progress has significantly impacted contemporary architectural practices, from using advanced parametric modeling tools to metaverse simulation. 3D printing and robotic construction technologies are revolutionizing our perception of architectural design and what we can achieve through digital fabrication. In addition to these topics, chapters explore the potential of augmented virtual realities applied in heritage documentation and education.

With the addition of laser scanning technology, HBIM (Heritage Building Information Modeling) revisits the importance of the analog model and significantly contributes to the documentation process, thereby enhancing the understanding and preservation of heritage. Digital models also play an essential role in documenting the ephemeral architectures of world fairs, as demonstrated by the Palermo Mediterranean Fair of 1950 and the Milan Triennale.

The texts contained in this publication cover various applications of HBIM, including the integration of BIM and Geographic Information System (GIS) in cultural heritage management, emphasizing the importance of interoperability between these two systems, as shown in the study of the University Religious Center

(URC) in Los Angeles. Another HBIM approach is present in the study of Luciana Natoli's projects, which can materialize concepts that the designer has never graphically represented. In the digital age, the modeling tools available in the most advanced graphic programs allow for creating continuous, fragmented, amorphous, organic, and topological forms. In this lexicon of contemporary architecture, parametric architecture assumes a prominent role, as demonstrated by analyzing works such as *The Broad* in Los Angeles, USA, and form research processes.

Texts that explore new digital mapping technologies, including studies on the *Palazzo Cassa di Risparmi* by Luigi Vagnetti in Livorno, emphasize the importance of such advancements. In this case, a digital survey followed by a critical redesign of the facades reveals significant variations in the composition of these structures along the square. Also noteworthy is the 3D digital mapping of the *Venice Farm Chapel* by Decio Tozzi, an expressive example of contemporary architecture in Brazil, and the study of the sports pavilion in Bastia Umbria, which discusses the transdisciplinary nature of representation provided by BIM.

The texts cover different scales, from the object to the building to urban interventions, as in the case of *Tactical Urbanism* in urban centers and the debate on skyscrapers that mark the landscape and development of Italian coastal cities. Some researchers apply new technologies to conduct specific studies, such as analyzing contemporary gates, railings, and bell towers, as exemplified in the case of *Loggetta* (Italy), or researching lifeguard towers on the coast of Miami (USA).

Other texts explore material, language, and geometry in facade design, as evidenced by research on facade masonry for the restoration of the *Solimene Factory* and the study of facade grids in the works of architects from Alberti and Terragni to the present day, with works by Herzog & de Meuron, Carlos Scarpa, and Aldo Rossi among the many presents in the texts. Architects and scholars also discuss the role of ornaments in contemporary architecture in the *Expressive Constructions*. Still, about facades, there are essays on compositional aspects related to kinetic and programmed art and applications of algorithmic modeling capable of generating thousands of possibilities for ornamental or decorative motifs.

In the context of technologies, the discussion ranges from the cognitive potential of freehand drawing and the creative limits of using AutoCAD to the creation of digital architectures for virtual experiences aimed at formulating hypotheses about heritage and providing digital immersion in historical spaces, as highlighted in the text on the architectural heritage of Rio de Janeiro. *Isola Comacina's villas* use 3D digital modeling, BIM, and Virtual Reality (VR) to present their information, which they can share via VR and web VR.

This publication also examines the field of Artificial Intelligence (AI) in architecture, exploring its role in optimizing work times and decision-making processes and generating various variations in design and materials. An important example is the study that uses an AI model to identify contemporary architecture in terms of morphology, stylistic features, and strategic aspects. This approach adds algorithmic capabilities to aesthetic requirements and the designer's role. In the electronic and digital age, the mathematical and numerical instrumentation of various software programs has served as a basis for innovative forms, triggering debates

between digital architecture and reality. The metaverse plays a significant role in understanding works and projects, as highlighted in the text on this *modus operandi*, as well as in the imaginative vertical cities conceived by Henri Ciriani.

Sustainability, the use of recycled materials, energy efficiency, and the conscious use of natural resources are also part of the lexicon of this collection. In this context, the study of Saint Paul Hospital stands out, which adopts a regenerative architecture approach that goes beyond mere sustainability, creating spaces that minimize negative impacts and actively contribute to the revitalization and regeneration of the environment. Additionally, this compilation comprises examinations and dialogues concerning the core tenets of the circular economy and its impact on shaping the current architectural discourse. This remodeling occurs through the implementation of construction processes that aim for complete waste elimination and the integration of carbon assessment, fostering a more conscious and sustainable approach to both building design and execution. Urban green areas studies include cities like Milan and the Citylife region, which showcase urban solutions designed by renowned contemporary architects such as Isozaki, Libeskind, and Zaha Hadid.

Advanced artificial intelligence algorithms mediate both the world of fashion and architectural materials, highlighting the multidisciplinary nature of this publication's approach. The publication presents studies exploring different materials and technologies in the design of iconic chairs, as well as visualizing the Rubik's Cube through digital models and designs. In the same artistic spectrum, themes related to urban art are addressed, such as the Recoleta Cultural Center in Buenos Aires, designed by Clorindo Testa, and a reflection on contemporary artistic interventions on the facades of historical centers in cities like Rome, Bologna, and Milan.

Sharing the richness and diversity of the themes in this publication and promoting a broader understanding will catalyze the construction of critical reflections and visionary proposals for heritage, architecture, and engineering in the twenty-first century. Interdisciplinary dialogue and exploration of technological frontiers are essential to guide innovation and shape a more sustainable, aesthetically enriching, and culturally relevant architectural future.

Due to the high number of contributions, the publication consists of two volumes.

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Roma, Italy  
São Carlos, Brazil

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