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Editorial

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Keywords: relevance, doctoral research in architecture, methodology, transdisciplinary integration, innovative use of technology

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Unlike introductions to other issues of our journal, and because this issue includes the first seven of our participants' contributions to the conference on the relevance of doctoral studies in architecture, this introduction first discusses each paper's key issues, methodologies deployed and contribution to knowledge. We are then looking at common themes, to finally conclude as to how the themes discussed and the research on architecture at doctoral level undertaken currently are of relevance to the contemporary world.

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In **"Gesture" as a Subject of Doctoral Research in Architecture: Evidence-based Intuitions on a Complex Relationship"** by Angelos Psilopoulos, the key themes discussed were in relation to Gesture in architecture as both narrative and embodied action, the autonomous nature of gesture, the dialectic relationship between gesture and architecture, and the synthetic nature of reality in architectural research. A critical overview of diverse evidence and a functionalistic scope to understand architectural gesture contributes to establishing architecture as a prime field for studying gesture, and positions gesture as a generator of architectural value. Psilopoulos emphasizes the importance of gesture within architecture, proposing that it operates independently yet contributes significantly to architectural value. This perspective underscores the synthetic and interdependent nature of architectural research, suggesting a dynamic interplay between conceptual and practical realms.

In **"Unveiling Geographies Through Infrastructure: The Mantua-Peschiera Branch Line as a Palimpsest"** by Federico Marcolini the key themes are around a historical analysis of railway infrastructure, the concept of landscapes as historical palimpsests, towards regenerating abandoned railways. The research methodology undertakes archival research, data-driven historical analysis, and the case study approach. The contribution of this research focuses on highlighting the potential of historical branch lines for regional transformation, and on advocating for sustainable reintegration of abandoned infrastructures.

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a After her graduation as an architect-engineer, Maria pursued her PhD at the University of Bath, School of Architecture (1996) investigating the design process of non-standard architecture entitled "An Insight into the Design Process of Unconventional Structures" that was supervised by Dr Chris Williams and Professor Sir Edmund Happold. Beyond working as a freelance architect since 1988 in Greece and Europe, she worked for Buro Happold (1993-1996).

Whilst practising and conducting research, Maria worked as an adjunct lecturer at the School of Architecture of the University of Bath. She decided to engage further in academia. Prior to becoming a Professor of Architecture at ARU (September 2018) Maria taught for over 11 years at Bath and Plymouth universities as Senior Lecturer, as a Visiting Professor for a semester in Denmark (Aarhus School of Architecture) and as Professor of Design and Technology until 2018, at the School of Architecture of Aristotle University of Thessaloniki.

Maria is a confirmed researcher and educator, a proof of which is her recent book Architectural Materialisms: nonhuman creativity (Edinburgh University Press, October 2018) and 9 prizes her students were recently awarded on their final design theses by participating in international student competitions.

b Valerio Perna (Rome, 1988) is an architect and holds a PhD in "Architecture - Theories and Design" from Sapienza - University of Rome. During his studies, he has been a Visiting Scholar at AUAS Amsterdam and has lectured and taught in several International venues such as Iran, Sweden, and Albania. He is currently employed at POLIS University (Tirana, AL), where he is part of the INNOVATION_Factory (IF) Management Staff and Head of the Research Center in Information and Resources. His research agenda explores the role of playfulness and ludic processes in contemporary architectural practice to address complexity and behavioural phenomena in the urban fabric. Valerio has been published in several international magazines and has been invited as a speaker European and Asian venues. He is a member of the Editorial Boards of architectural journals and series such as FORUM A+P - Interdisciplinary Journal of Architecture and Scientific Environment, the OMB Series, and Gli Strumenti series. In 2020 he published his first monograph L'attività ludica come project strategy. Rules of libertà per una grammatica del gioco in architettura (Quodlibet).

Marcolini's research integrates historical and geographical analysis with practical regeneration projects. This approach demonstrates how understanding the historical and social layers of infrastructure can inform contemporary architectural practices aimed at sustainable development.

"Henri Bergson's Philosophy and Architecture" by Mark Rego focuses on three themes, namely the ontological status and agency of memory in architecture, and the transience and permanence in architectural works, all intertwined with Bergsonian philosophy (duration, perception, memory). These are rigorously investigated through philosophical analysis, and the application of Bergson's theories to architecture. The research provides a new perspective on the role of memory and time in architecture and offers a Bergsonian approach to both the understanding and practice of architecture. Rego introduces Bergson's philosophical concepts to architectural theory, highlighting the importance of memory and time. This approach enriches the understanding of the architectural experience and suggests new methodologies for both analysis and design, emphasizing the fluid and temporal nature of architectural practice.

In **"Rhythm Analysis Framework for Urban Design Interventions" by Pinar Seftakli,** the focus is on urban rhythms and social dynamics, spatio-temporal analysis of urban life, and design interventions aligned with social contexts. The research has been undertaken in a rhythm analysis framework and documentation and analysis of urban rhythms. The contribution of this research is to provide a replicable framework for understanding and designing urban spaces and to bridge academic research with practical urban design. Seftakli's work on rhythm analysis offers a structured approach to understanding urban dynamics. By identifying and analysing various urban rhythms, this framework enables more contextually appropriate and dynamic design interventions, enhancing the responsiveness of urban planning to social dynamics.

Rafael Sousa Santos, in **"The Role of Freehand Drawing in Architectural Design Teaching"** discusses the importance of empirical evidence in architectural research, the role of freehand drawing in design education, and the methodological rigour in architectural research. The research deploys embedded multi-case study design, qualitative and quantitative data collection, and thematic analysis using software tools. This research contributes to new knowledge by demonstrating the value of methodological rigor in architectural research, and by highlighting the pedagogical importance of freehand drawing. Santos' emphasis on methodological rigour and empirical evidence underlines the importance of systematic research in architectural education. His study supports the integration of traditional techniques like freehand drawing with contemporary educational practices, ensuring a comprehensive design education.

In **"Transformative Influence of Text-to-Image Generative AI on Architectural Visualizations"** by Styliani (Stella) Salta and Miltiadis Katsaros the focus lies on the integration of AI in architectural workflows, the synergy between human creativity and AI, and the ethical considerations in AI-driven design. The methodology deploys historical tracing of TTI model evolution and exploratory analysis of AI's role in design. The research advocates for AI as a catalyst for creativity rather than a mere tool and highlights the need for ethical frameworks in AI integration. Salta and Katsaros explore the transformative potential of AI in architecture, emphasizing its role in augmenting human creativity. Their work calls for ethical considerations in AI use, advocating for its role in pushing the boundaries of architectural imagination while recognizing the collaborative nature of AI-human interactions.

"Ai Bacon: Autonomous Form in Architecture Inspired by Francis Bacon's Paintings" by Nefeli Chatzimina works on the intersection of art and architecture, the autonomous form and Object-Oriented Ontology, and the reinvention of realism through allusion. Methodologically, the research uses conceptual analysis of Francis Bacon's paintings and the development of a diagrammatic abstract machine. The researcher proposes a novel approach to realism in architecture and integrates artistic insights with architectural theory. Chatzimina's study bridges art and architecture, using the works of Francis Bacon to explore new forms of realism. By conceptualizing architectural forms through artistic allusion, her research proposes innovative methodologies for both theoretical and practical exploration in architecture.

The aforementioned analysis of the essays included in this issue allowed us to integrate these insights into a coherent theoretical framework that addresses the intersection of architecture, methodology, and innovation. Based on these analyses, we can propose a position that integrates the key insights from the abstracts:

1. Transdisciplinary Synthesis and Dynamic Methodologies in Architectural Research

Architectural research benefits significantly from transdisciplinary approaches that synthesize insights from art, philosophy, historical analysis, and technological innovation. Key elements of this position include:

1. **Transdisciplinary Integration**: Combining diverse fields such as philosophy (Rego), art (Chatzimina), and technology (Salta and Katsaros) enriches architectural theory and practice.
2. **Dynamic Methodologies**: Emphasizing empirical evidence (Santos) and dynamic frameworks (Seftakli) ensures that architectural research remains contextually relevant and methodologically rigorous.
3. **Temporal and Social Contextualization**: Understanding the temporal aspects of architecture (Rego) and the social dynamics of urban spaces (Seftakli) allows for more responsive and sustainable design interventions.
4. **Innovative Use of Technology**: Leveraging AI (Salta and Katsaros) and data-driven historical analysis (Marcolini) can transform traditional practices, introducing new possibilities for creativity and sustainability.
5. **Artistic and Philosophical Perspectives**: Integrating artistic concepts (Chatzimina) and philosophical

theories (Rego) provides deeper insights into the experiential and conceptual dimensions of architecture.

This position underscores the importance of a holistic and adaptive approach to architectural research, one that embraces complexity and fosters innovation through transdisciplinary collaboration.

To identify common threads among the essays in relation to the relevance of doctoral research in architecture, we analysed how each study contributes to the broader field of architectural research, what methodologies they employed, and what thematic elements they shared. The common themes were:

1. **Transdisciplinary Approaches**:
   - **Angelos Psilopoulos**: Integrates concepts of gesture from both narrative and embodied action perspectives within architecture.
   - **Federico Marcolini**: Combines historical analysis with geographical and infrastructural studies.
   - **Mark Rego**: Applies philosophical theories of memory and time to architectural understanding.
   - **Styliani (Stella) Salta and Miltiadis Katsaros**: Merges AI technology with architectural visualization practices.
   - **Nefeli Chatzimina**: Connects art, particularly Francis Bacon's paintings, with architectural form and theory.
2. **Methodological Rigor and Innovation**:
   - **Rafael Sousa Santos**: Emphasizes the need for empirical evidence and a structured methodological approach in architectural research.
   - **Pinar Seftakli**: Proposes a rhythm analysis framework that is replicable and adaptable to urban design.
   - **Angelos Psilopoulos**: Utilizes a broad and diverse body of evidence to challenge and redefine traditional concepts in architecture.
3. **Historical and Temporal Contextualization**:
   - **Federico Marcolini**: Examines the historical significance of railway lines and their role in regional transformation.
   - **Mark Rego**: Explores the impact of memory and the passage of time on architectural works.
   - **Pinar Seftakli**: Analyzes urban rhythms over time to understand social dynamics.
4. **Technological Integration and Innovation**:
   - **Styliani (Stella) Salta and Miltiadis Katsaros**: Investigates the transformative potential of AI in architectural design.
   - **Nefeli Chatzimina**: Utilizes AI techniques to analyze and reinterpret artistic concepts within architectural contexts.
5. **Practical and Theoretical Contributions**:
   - **Angelos Psilopoulos**: Contributes to both theoretical understanding and practical applications of gesture in architecture.
   - **Federico Marcolini**: Provides a framework for heritage preservation and infrastructure regeneration.
   - **Rafael Sousa Santos**: Enhances the pedagogical practices in architectural education through methodical research on freehand drawing.
   - **Pinar Seftakli**: Bridges academic research with practical urban design interventions.

2. Relevance of Doctoral Research in Architecture

The common threads highlighted several key aspects of the relevance of doctoral research in architecture:

1. **Expanding Theoretical Foundations**:
   - Doctoral research pushes the boundaries of traditional architectural theory by incorporating interdisciplinary perspectives and new philosophical insights. For example, Mark Rego's application of Bergsonian philosophy to architecture introduces novel ways of thinking about memory and time in the built environment.
2. **Innovative Methodologies**:
   - The development and application of new methodologies, such as Pinar Seftakli's rhythm analysis framework and Rafael Sousa Santos' structured approach to empirical research, showcase the importance of methodological innovation in generating robust and replicable results.
3. **Addressing Contemporary Challenges**:
   - Doctoral research addresses pressing contemporary issues such as sustainability, regional transformation, and technological integration. Federico Marcolini's focus on railway regeneration and Styliani Salta and Miltiadis Katsaros' exploration of AI in design are prime examples of how doctoral research can contribute to solving real-world problems.
4. **Integrating Technology and Creativity**:
   - The integration of advanced technologies like AI into architectural research and practice, as seen in the work of Salta Katsaros and Chatzimina, demonstrates how technology can enhance creative processes and open up new avenues for architectural innovation.
5. **Historical and Social Awareness**:
   - A deep understanding of historical context and social dynamics, as explored by Marcolini and Seftakli, underscores the importance of considering the temporal and societal impacts of architectural projects. This awareness is crucial for creating designs that are not only innovative but also contextually and culturally relevant.
6. **Pedagogical Contributions**:
   - Enhancing architectural education through rigorous research, such as the work by Rafael

Sousa Santos on freehand drawing, highlights the role of doctoral research in improving educational practices and preparing future architects with a solid foundation in both theory and practice.

The common threads among these essays revealed that doctoral research in architecture is essential for advancing the field through transdisciplinary approaches, methodological rigour, and practical applications. By addressing contemporary challenges, integrating new technologies, and enhancing theoretical and pedagogical foundations, doctoral research significantly contributes to the evolution and enrichment of architectural knowledge and practice.

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'AI Bacon' Architecture as an Object of Speculation and Allusion: Autonomous Form – Object Oriented Ontology – Speculative Realism Reinvent New Weird Realism Through Allusion

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Keywords: Autonomous Form, Object Oriented Ontology, Speculative Realism, Allusion, Artificial Intelligence, weird Realism

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ABSTRACT

'Ai Bacon' research focuses on the relationship between Autonomous Form in Architecture and paintings of artist Francis Bacon in order to reinvent Realism through the concept of Allusion[1]. Nine key terms of Autonomous Form[2], of Object Oriented Ontology[3] and Speculative Realism[4] are defined, in parallel nine Francis Bacon paintings through his suggestion to reinvent Realism[5]. It is a journey of thought relating nine (9) Real-istic Objects[6] *key terms*[7] with nine (9) Sensual Objects selected *paintings* of Francis Bacon as the way to approach a new Reality. The proposal of this paper is to generate a diagrammatic Abstract Machine of nine (9) Quadruple objects, elements and traits of Francis Bacon's work that generate new Species of Objects connected through allusion. This relation through allusion[8] is the way to approach Reality and reinvent Weird Realism[9].

a Nefeli Chatzimina is an architect, engineer, designer, and founder of architectScripta, an interdisciplinary architectural platform initiated in New York and based in Athens, Greece, specializing in experimental design and emerging technologies. Nefeli has worked as an Architect for her professor, Bernard Tschumi, in New York and holds a Master of Science in Advanced Architectural Design from Columbia University NYC. She has taught Design Studio independently as a Lecturer at the University of Southern California in Los Angeles. She has lectured at universities in the US and India, as well as highly prestigious venues and museums in Athens, Greece. She is currently a PhD Candidate at the National Technical University of Athens, from which she graduated.

1 Allusion plays a role in hinting at or suggesting aspects of reality that may not be immediately apparent or accessible through ordinary means of cognition. Speculative realism employs allusion as a tool for expanding our understanding of the world and inviting philosophical reflection on the nature of existence.

2 Autonomous form in architecture refers to design elements or structures that possess self-sufficiency, independence, and coherence within a larger architectural composition, often expressing individuality or distinctive character.

3 Object-oriented ontology (OOO) is a philosophical perspective that emphasizes the independent existence and agency of objects, regardless of human perception, proposing a "flat ontology" where all objects, from living beings to inanimate things, are considered equally real and worthy of philosophical inquiry. OOO emerged in the late 20th and early 21st centuries, primarily associated with contemporary speculative realism. It proposes that objects, both living and non-living, exist independently of human perception or cognition, and that they have an inherent reality and agency that cannot be reduced to mere human constructions or interpretations. OOO challenges the anthropocentric view that humans are the center of the universe or the only entities worthy of consideration. Instead, it suggests that objects have their own autonomy and existence, regardless of whether humans perceive them or attribute meaning to them.

4 'Speculative Realism An Introduction' by Graham Harman

5 Francis Bacon interview to Sylvester n.3 . *'We have to reinvent Realism. There is no such a thing as Realism.'*

6 In Object-Oriented Ontology (OOO), Real Objects and Sensual Objects are two key concepts that help elucidate the ontology proposed by this philosophical framework. In summary, Real Objects in OOO are the autonomous entities that exist independently of human perception, while Sensual Objects are the representations or appearances of these Real Objects as they are experienced by sentient beings. The distinction between Real and Sensual objects underscores OOO's rejection of anthropocentrism and its emphasis on the Autonomy and complexity of non-human entities.

7 Through this process we define nine key Terms: Autonomous Form, Real Fact, Scale, Triptych, Formal behavior, Allusion, Diagram, Speciation and Weird Realism in order to generate nine (9) Real Objects with real qualities. In parallel equivalent key Terms are observed in Francis Bacon's paintings under the notion of Formal Aesthetics, trying to reinvent Realism and define nine (9) relevant Sensual Objects with sensual qualities. This organization of thinking finally forms nine (9) as nine Quadruple Objects (fourfolds) of Real and Sensual Objects.

8 The key for this strategy is to rely on Allusion as the way to approach Reality and reinvent Weird Realism.

9 Francis Bacon claims that 'We have to reinvent Realism. There is no such a thing as Realism.'

The nine pairs formed through this study are the nine Quadruple[10] Objects[11] of Real architectural entities and sensual objects generated to study a wider applied model. This model operates as an Abstract Machine[12], a Diagram of nine Quadruple Objects which is a research tool for reinventing any potential weird Realism[13]. This model of nine meta-Objects uses artificial intelligence techniques and processes that can be applied to any Creator's work in order to extract its quadruple[14] elements and approach any work or thinking as an autonomous Realistic Object far from is sensual qualities.

The Diagram: ABSTRACT MACHINE of nine (9) Quadruple Objects:

1. Pair 1: Generic Form in Autonomous Form (Real Object) – Isolated Figures of Francis Bacon (Sensual Object)
2. Pair 2: Real Fact (RO) in Object Oriented Ontology– Matters of Fact of F.B.(SO)
3. Pair 3: Scale in Architectural thinking (RO) – Traits of F.B. (SO)
4. Pair 4: Architectural Triptych in Autonomous Form (RO) – Francis Bacon's Triptyches (SO)
5. Pair 5: Formal behavior in Autonomous Form (RO) - Formal Figures in F.B. (SO)
6. Pair 6: Allusion in Object Oriented Ontology (RO) - Chimera Allusion in F.B. (SO)
7. Pair 7: Diagram as Abstract Machine in Architecture (RO) - multiple Realities through Allusions (SO)
8. Pair 8: Mutated Species in Formal exploration (RO) - New Speciation in F.B. (SO)
9. Pair 9: Unfamiliar Affekt in Formal Aesthetics (RO) - Weird Realism in F.B. (SO)

1. Introduction

This research -called 'Ai Bacon'- focuses on the relationship between Autonomous Form in Architecture and the work of painter Francis Bacon in order to reinvent Realism through Allusion[15] -as a tool to approach Reality-. Autonomous Form is approached under the notion of Object Oriented Ontology[16], a philosophical perspective primarily associated with Speculative Realism[17] in Philosophy. In parallel the work of Francis Bacon is revealed as the need to reinvent Realism[18]. To reach these interdisciplinary connections a journey of thought commences to relate nine (9) Real Objects[19] -meaning nine Concepts that redefine Autonomous Form within the framework of Object Oriented Ontology [OOO]- with nine (9) Sensual Objects meaning nine selected paintings of Francis Bacon.

The outcome of this study is to generate an Abstract Machine of Objects, elements and traits from Francis Bacon's work -in this case- where the new Species are related through allusion in order to redefine a new weird Realism[20].

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10 'Quadruple Object is a fourfold structure of two kinds of Objects and two kinds of qualities: Real and Sensual in both cases. Real objects and qualities exist in their own right, while sensual objects and qualities exist only as the correlate of some real object, whether human or otherwise. Since objects cannot exist without qualities and vice versa, there are only four possible combinations, indicated by the four lines between the circles of the fourfold scheme.' Graham Harman 's book 'Object-Oriented Ontology A New Theory of Everything p.52.

11 In Object-Oriented Ontology (OOO), a quadruple object is an entity that exists independently of human perception, consisting of four aspects: sensual, real, intentional, and effective.

12 Gilles Deleuze's concept of the abstract machine refers to dynamic systems of interconnected elements generating potentialities and functions, emphasizing processes over fixed structures in various fields such as philosophy, art, and sociology.

13 Weird Realism as in the context of Speculative Realism-OOO and as in the context of Framcis Bacon s paintings.

14 A quadruple object, in the context of Object-Oriented Ontology, is an entity composed of four aspects: sensual, real, intentional, and effective, emphasizing its autonomous existence beyond human perception.

15 Allusion plays a role in hinting at or suggesting aspects of reality that may not be immediately apparent or accessible through ordinary means of cognition. Speculative realism employs allusion as a tool for expanding our understanding of the world and inviting philosophical reflection on the nature of existence.

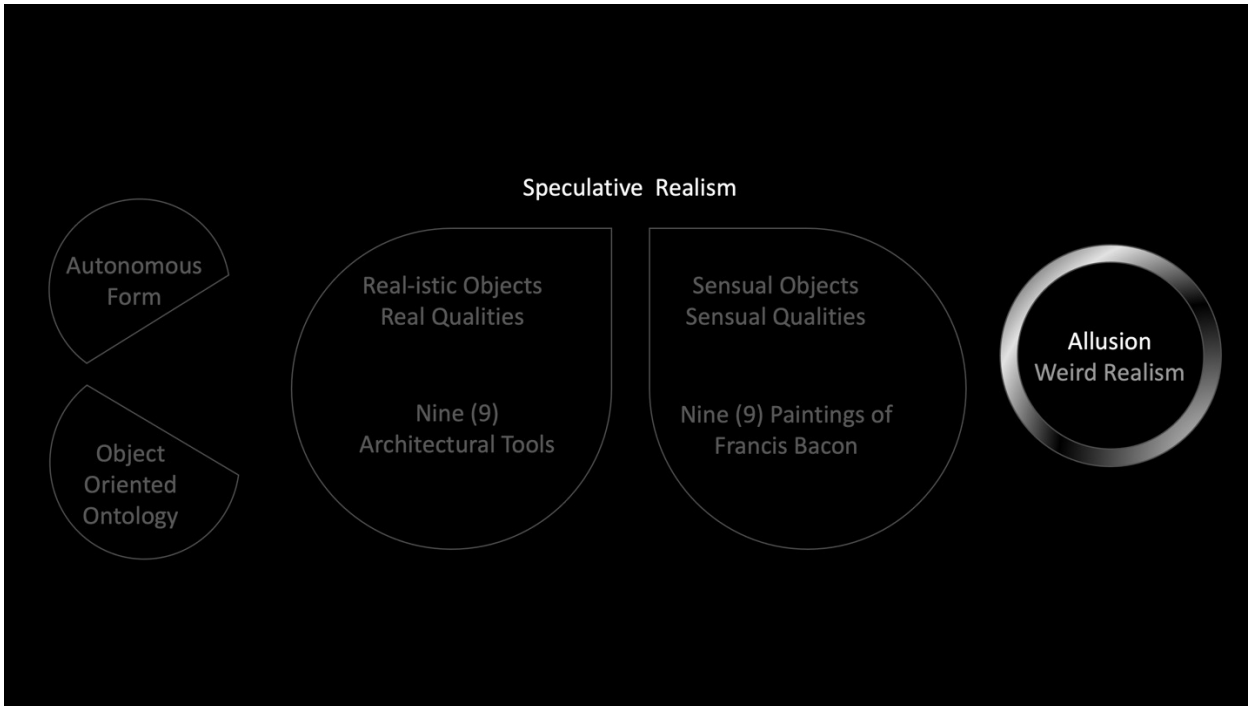
16 Object-oriented ontology (OOO) is a philosophical perspective that emphasizes the independent existence and agency of objects, regardless of human perception, proposing a "flat ontology" where all objects, from living beings to inanimate things, are considered equally real and worthy of philosophical inquiry. OOO emerged in the late 20th and early 21st centuries, primarily associated with contemporary speculative realism. It proposes that objects, both living and non-living, exist independently of human perception or cognition, and that they have an inherent reality and agency that cannot be reduced to mere human constructions or interpretations. OOO challenges the anthropocentric view that humans are the center of the universe or the only entities worthy of consideration. Instead, it suggests that objects have their own autonomy and existence, regardless of whether humans perceive them or attribute meaning to them.

17 'Speculative Realism An Introduction' by Graham Harman. Speculative realism within Object-Oriented Ontology (OOO) is a philosophical movement that asserts the existence of reality beyond human perception, emphasizing a robust form of realism and promoting a "flat ontology" where all objects, human and non-human, are considered equally real and worthy of philosophical inquiry.

18 Francis Bacon interview to Sylvester n.3 . '*We have to reinvent Realism. There is no such a thing as Realism*.'

19 In Object-Oriented Ontology (OOO), Real Objects and Sensual Objects are two key concepts that help elucidate the ontology proposed by this philosophical framework. In summary, Real Objects in OOO are the autonomous entities that exist independently of human perception, while Sensual Objects are the representations or appearances of these Real Objects as they are experienced by sentient beings. The distinction between Real and Sensual objects underscores OOO's rejection of anthropocentrism and its emphasis on the Autonomy and complexity of non-human entities.

20 Francis Bacon claims that *'We have to reinvent Realism. There is no such a thing as Realism.'*



This Abstract machine can be diagrammatically applied to any architectural or artistic work.

2. Object Oriented Ontology – Formal Aesthetics

Graham Harman invents the term 'Weird Realism' supporting in some sense the idea of what we call 'Weird'. It is about the strangeness in Reality that is not projected onto Reality by us. It is already there by dint of being real. Object Oriented Ontology [OOO] refers to the 'weird' trying to bridge the gap between Reality and its clear statements. In Object Oriented Ontology [OOO] objects relate to each other indirectly. There is a difference between objects and their relationships. We conceive objects as nothing more than a series of qualities and properties

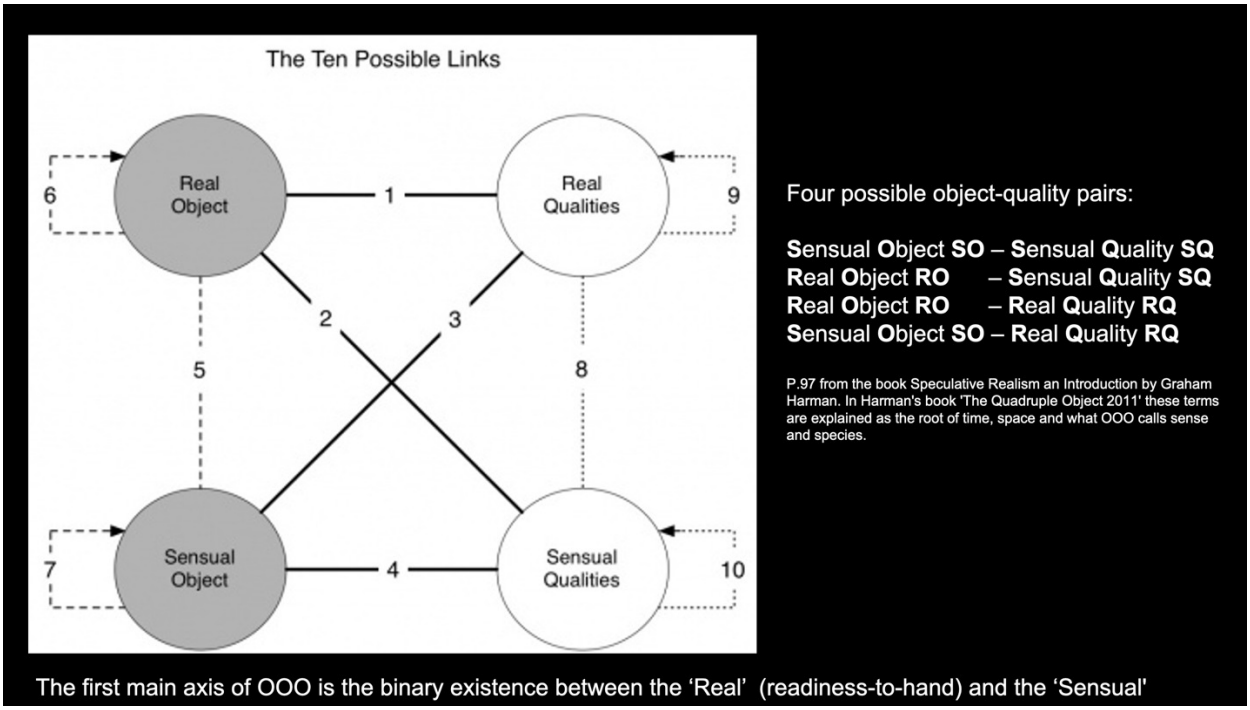
focusing on 'the essence of the object'. The terminology of Object Oriented Ontology [OOO] refers to two axes of difference such as Real versus Sensual and Object versus Quality. The diagram of Graham Harman creates dualities between real and sensual objects with real and sensual qualities framing the idea of a quadrable object.

At this point a question is raised: 'Is there an Object Oriented Architecture?'. David Ruy on 'Returning to Strange Objects', Tom Wiscombe on 'Discreetness, Hatch, Log' and Marc Cage on 'Killing Simplicity' come to the conclusion that architectural proposal for Object Oriented Ontology [OOO] is to imagine that Architecture can give hints and allusions with a deeper alternative view of Reality. But Art does not give direct knowledge of Reality. Relations between objects take place in the form of allusion[21]. The allusion is recognized with aesthetic results. Herein lies the importance of Aesthetics in Object Oriented Ontology [OOO]. There are many ways to gain indirect access to the real through allusion, or reference. How love speech works is composed of hints, insinuations and allusions rather than statements and clear sentences. Just like jokes or magic tricks are easily broken when each step is explained.

The recommended way of communication is to imply, to hint at the existence of an object without replacing it with a literal description of its properties. Something between scientific knowledge on the one hand and philosophical artistic knowledge on the other.

Given that Object Oriented Ontology [OOO] is itself a theory of autonomous objects and naturally endorses the formalist view that a work of art is a self-contained unit, at this point we are led to the concept of Aesthetic Formalism. Where the work of Art is independent and autonomous and should be approached in a spirit of dispassionate and independent thinking. Realism is somehow strange; it is about the 'weird' that is not projected onto Reality by us. Realism is "already there" as a result of being real. And so, it's a kind of Realism that doesn't have common sense. To the horror of Francis Bacon, his world is inhabited by objects, and they are objects precisely in the logic and sense of the

21 Allusion plays a role in hinting at or suggesting aspects of reality that may not be immediately apparent or accessible through ordinary means of cognition. Speculative realism employs allusion as a tool for expanding our understanding of the world and inviting philosophical reflection on the nature of existence.



Object-Oriented Ontology [OOO] in which it is impossible to perceive or even to describe by the normal mechanism of human intelligence.

In 2018 Francis Bacon exhibition took place at Pompidou. Francis Bacon's painting functions diagrammatically as an abstract machine that can adapt to any context placed on the canvas. It can be repeated as an Autonomous Form after being mutated or distorted as an abstract 'conceptual geometry' as an autonomous system with internal rules. Multiple realities can potentially be constructed using this suggestive diagram.

3. Process of nine (9) key Terms Analysis as Real Objects.

The key for the strategy of this Research is to rely on Allusion[22] as a tool, as the way to approach Reality and reinvent Weird Realism[23].

Proposal focuses on nine (9) key Terms to be defined as Real and Sensual Objects[24] in order to finally generate the Abstract Machine of Francis Bacon[25] made out of nine (9) Quadruple fourfold Objects. Real Objects are the autonomous entities that exist independently of human perception, while Sensual Objects are the representations or appearances of these Real Objects as they are experienced by sentient beings.

In order to form the Diagram of a Quadruple Object for each Pair of Real and Sensual Object, firstly nine (9) key Terms of Autonomous Form are defined and relate to nine (9) Realistic Objects with real qualities. Those nine Real Objects gain indirect access to nine Francis Bacon paintings. Selected paintings are conceived as Sensual Objects that relate to nine formal aesthetic elements with sensual qualities.

For the selected process of the Real Objects nine (9) key Terms will be defined: (1) Autonomous Form, (2) Real Fact, (3) Scale, (4) Triptych, (5) Formal behavior, (6) Allusion, (7) Diagram, (8) Speciation and (9) Weird Realism. Firstly, each of these Terms is approached under the notion of formal

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25 Any other Artist or Architect could be studied instead.

exploration for Autonomous Form or under the notion of OOO[26] and Speculative Realism in order to shape and define nine (9) **Real** Objects with real qualities.

In parallel same key Terms are observed and traced in Francis Bacon's[27] paintings under the notion of Formal Aesthetics, trying to reinvent Realism to define relevant nine (9) **Sensual** Objects with sensual qualities.

This organization of thinking finally forms nine (9) pairs of Real and Sensual Objects that end up shaping and Redefining the nine (9) key Terms as **Quadruple**[28] Objects. Before developing the nine (9) pairs of Quadruple Objects at this point we need to clarify exactly the definition of Terms being used in this research.

Nine (9) key Terms for Autonomous Form and Object Oriented Ontology [OOO]:

Generic Form (1), Real Fact (2), Scale (3), Architectural Triptych (4), Formal behavior (5), Allusion (6), Diagram (7), Mutated Species (8), Unfamiliar Affekt(9).

Firstly, regarding Autonomous Form, we accept a design method that conceives Architecture as a myopic laboratory of science. Generating Architecture at the level of thought, design and application is now unfolding as a **laboratory** science within an environment of research through advanced design techniques and digital construction technology. We approach Formal exploration through a myopic process of geometric design evolution, that is based on the ability of Architecture to act as an **Autonomous** entity, independently as an isolated geometry[29] within the sterile digital environment, without any Place, regardless Context, or scale constraints and far from considering practical issues such as function. Generation of space through Formal exploration primarily requests movement, time, circulation and a strong narrative of spatial experience through orchestrated views.

Based on focused long-term academic research in that direction, we assume that Formal exploration -as geometry- succeeds in structuring autonomous architectural systems of certain formal behavior based on internal autonomous rules of relationship that do not depend -through adapt- to the external forces of a Place, of -a Context-. Thus, we consider that architectural **Form** and architectural **Typology** coexist independently of scale and utilitarian function. That is, Formal exploration can be geometrically autonomous beyond scale of application or use-function (architectural program). The **diagrammatically autonomous generic Form (key Term n.1)** is thus defined. Generic Form has the strength and the ability to be applied to several Contexts, for several scales and various functions. Through Form it firstly operates in a diagrammatic level of approach and can be applied in numerous architectural study cases. The main strength of Generic Form is its diagrammatic quality. Architectural autonomous Form refers to a geometrical system that follows any Scale, can be shaped towards any utilitarian Function and adapts to any specific environment or Context.

Architectural processing of Topology, meaning formal exploration follows a fluid digital model from Zero to infinity. The concept of **Scale (key Term n.3)** is lost. It is fundamental that initially while digitally modelling formal geometry there is **no Scale**. The effect of scale depends not only on the object itself but on its relation to the whole environment or its Place. Giacometti used to draw everything smaller than he saw things. He believed the right scale is the size you instinctively find correct, the size you can really 'sees things'. He insisted to try to 'see' through his knowledge and used to draw everything small. The opposite scale of Objects that of hyper magnification, does not allow the viewer to grasp the Whole but to spatially experience part of the Whole.

The concept of Form in our approach follows a specific strategy of geometrical organization and design. It is analyzed and studied geometrically as a triptych of Structure, Mass and Skin. This is what in this research we call **Architectural Triptych (key Term n.4).** Formal exploration enhances **Formal behavior (key Term n.5)** of the geometry. The processing of Form is based on the processing of topological geometry during its movement, deformation and mutation in Time. Animation is the processing and evolution of Form and the design forces that shape it. Animate design is defined by the coexistence of movement and geometrical forces during formal exploration. Animation is used as a design tool and produces 'geometrical moments' from which various types of geometry -speciation- are registered within a wider taxonomy of species. The idea of **Mutated Species (key Term n.8)** is generated at this point. Formal mutation is a key point for Formal exploration processes. We call mutation of geometry the mathematical technical addition and subtraction of geometry to the original geometrical form[30]. Through transformation but mostly through mutation of a Form, new species are generated and this can lead to a variation of forms and a wide taxonomy of new species available to be included in new formal speciation.

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26 Object Oriented Ontology

27 Any other Artist or Architect could be studied instead.

28 'Quadruple Object is a fourfold structure of two kinds of Objects and two kinds of qualities: Real and Sensual in both cases. Real objects and qualities exist in their own right, while sensual objects and qualities exist only as the correlate of some real object, whether human or otherwise. Since objects cannot exist without qualities and vice versa, there are only four possible combinations, indicated by the four lines between the circles of the fourfold scheme.' Graham Harman 's book 'Object-Oriented Ontology A New Theory of Everything p.52.

29 archi|DOCT 12 **GEOMETRY** p.46, February 2019, www.enhsa.net/archidoct, ISSN 2309-0103: Cellular Design 46 Christoph Klemmt, University of Applied Arts in Vienna, Austria

30 archi|DOCT 3 **FIELDS** p.50, July 2014, ISSN 2309-0103, www.enhsa.net/archidoct , Hyper-Morphology: Experimentations with Bio-inspired Design Processes for Adaptive Spatial Re-use, Jia-Rey Chang // TU Delft

Beyond the analysis above on key Terms regarding Autonomous Form the most important key Term is the **Diagram (key Term n.7)**. Diagram is defined as an "Abstract Machine"[31] because it operates as an adaptable mechanism (henceforth Machine) without scale, without function and without a specific Site or Context. An Abstract Machine is not something physical or material but semiotic and diagrammatic. It acts as an assumption and not as a material substance. As a Function and not as a Form. The Diagram does not operate to represent something Real but constructs the Real to come. **The Diagram constructs a new kind of Reality.**

The Diagram constructs an **Allusive reality** adaptable to any given functional and spatial condition, therefor it is Abstract. A Diagram as a customizable Abstract Machine of relationships between things (Objects) can lead to numerous Concrete Assemblages, meaning several iterations as architectural synthesis results.

Last key Term analyzed regarding Autonomous Form is the **Unfamiliar Affekt (key Term n.9)**. The term 'Affekt' or Affect in Architecture refers to the emotional response or affective impact of the Receiver based on experiential qualities of proposed architectural space. 'Affekt' is provoked through special effects. Unfamiliar Affekt suggest a concept where the emotional response is generated due to the weird effect of a strange element in a recognizable environment. Unfamiliar Objects in a typical familiar Context.

At this point of this research two more key Terms of Analysis will be defined below, in order to complete the introduction on the nine (9) key Terms of Analysis on Autonomous Form, Object Oriented Ontology [OOO] and Speculative Realism. Below the approach for Real Fact (key Term n.2) and Allusion (key Term n.6) are developed.

In Object Oriented Ontology all objects must be given equal attention, whether they be human, non-human, natural, cultural, real or fictional. Objects come in two kinds: Real Objects which exist whether or not they currently affect anything else and Sensual Objects which exist only in a relation to a Real object. Real objects relate to one another indirectly by means of a Sensual Object[32]. An Object in OOO is irreducible in both directions: an object is more than its pieces and less than its effects[33]. Also Objects are mutually autonomous[34] within an Event. In modern philosophy the term "Event" refers to an exclusively specific Fact[35] with the usual implication that the constituents of an event have no strong independent existence outside the event. As if the 'Event' is the philosophical Lieux where its components meet, while outside the Event -according to Graham Harman- components have an autonomous existence. A **Real Fact (key Term n.2)** for OOO is considered as a Real Object[36].

Object Oriented Ontology is an object-oriented philosophy where indirect relations between objects take place in the form of **Allusion (key Term n.6)**. In OOO objects relate to each other indirectly, even fictitious unicorns, Popeye or governments and grains of sand. There are many ways to gain indirect access to the Real through allusion, speculation or reference. Graham Harman invents the term "**Weird Realism**" in his book Speculative Realism. Realism is always in some sense weird. It is about the strangeness in Reality that is not projected onto reality by us. It is already there by dint of being real. When the OOO refers to the "strange" it tries to bridge the gap between reality and its clear statements. How love speech works is composed of hints, insinuations, and allusions rather than statements and clear sentences. Just like jokes or magic tricks are easily broken when each step is explained. The relationship with the 'strange' is momentary and fleeting. In order to make **aesthetics weird**, we need the contrast of the aesthetic unfamiliarity of the unrecognized and therefore otherworldly weird object within a familiar reality that we have constructed. This is how Allusion to Aesthetics is born, as in moments characterized 'Grotesque but cute', 'Playful but horrific'. The allusion is recognized with aesthetic results, i.e. aesthetics becomes philosophy. Herein lies the importance of **Aesthetics** in OOO. Given that OOO is itself a theory of autonomous objects and naturally endorses the formalist view that a work of art is a self-contained unit, at this point we are led to the concept of **Aesthetic Formalism**. There the work of Art is independent and autonomous and should be approached in a spirit of dispassionate and independent thinking. OOO has also been approached by certain **Architects**[37] and their architectural proposal for OOO is to imagine an Architecture can give hints and allusions with a deeper alternative view of Reality.

Francis Bacon rightly argues that there is no such thing as 'Natural Realism' and that we need to reinvent the concept of Realism. When an Object is **familiar** within a strange system then the concept of Speculative **Allusive Realism** is enhanced. **Francis Bacon** in his work shows *modality and states that reality is constructed*. He achieves this by making the unfamiliar to receive interpretation. He constructs the 'weirdly **strange'** between familiar objects in order to **allude another Reality.** In regards to the horror of Francis Bacon, his world is inhabited by Objects precisely in the logic and sense of the OOO in which it is impossible to perceive or even to describe by the normal mechanism of human intelligence.

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31 Following the approach by Gilles Deleuze on Diagram as an Abstract Machine.

32 Graham Harman 's book 'Object-Oriented Ontology A New Theory of Everything p. 9.

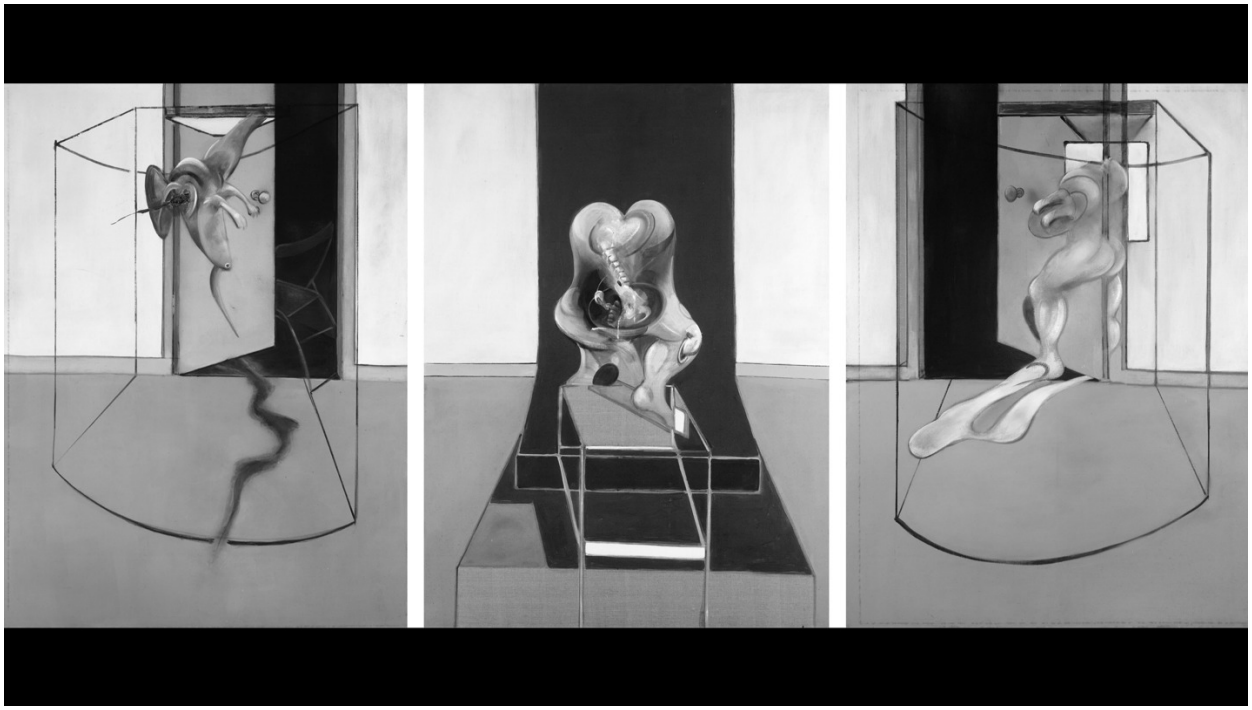
33 Graham Harman 's book 'Object-Oriented Ontology A New Theory of Everything p. 53.

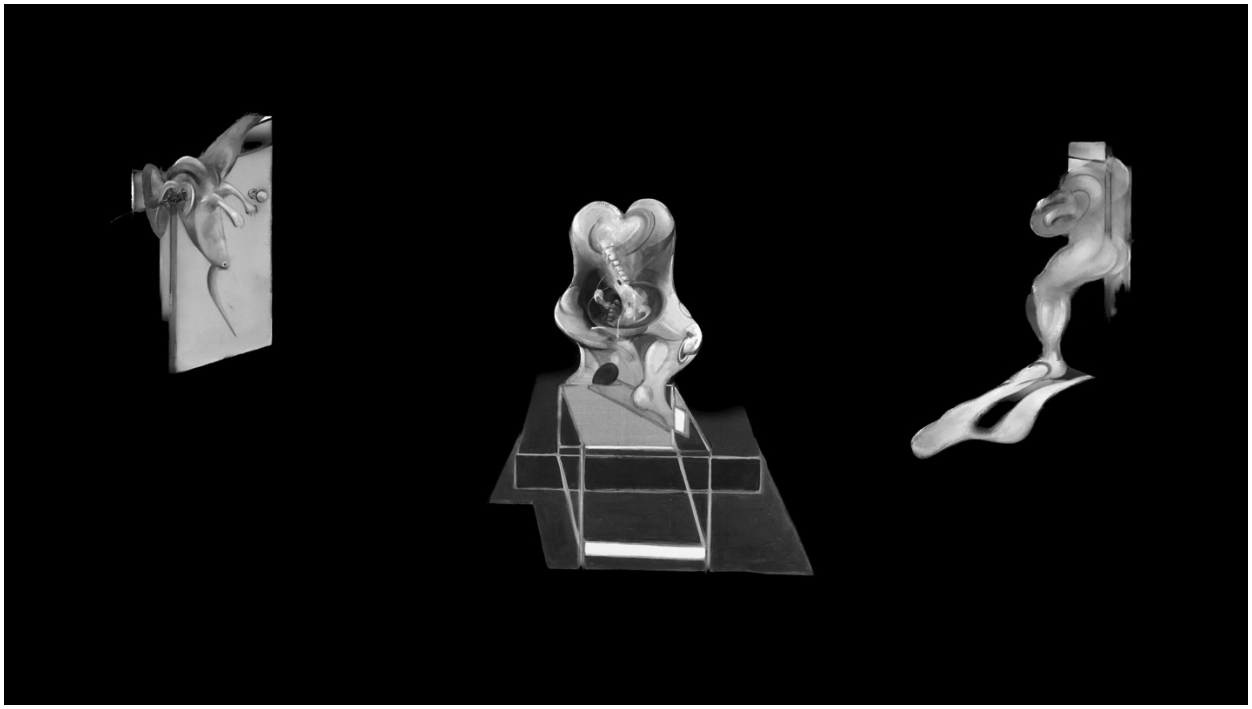
34 Graham Harman 's book 'Object-Oriented Ontology A New Theory of Everything p.12.

35 Graham Harman 's book 'Object-Oriented Ontology A New Theory of Everything p.52.

36 Graham Harman 's book 'Object-Oriented Ontology A New Theory of Everything p.52.

37 David Ruy on 'Returning to Strange Objects', Tom Wiscombe on 'Discreetness, Hatch, Log', Marc Cage on 'Killing Simplicity'

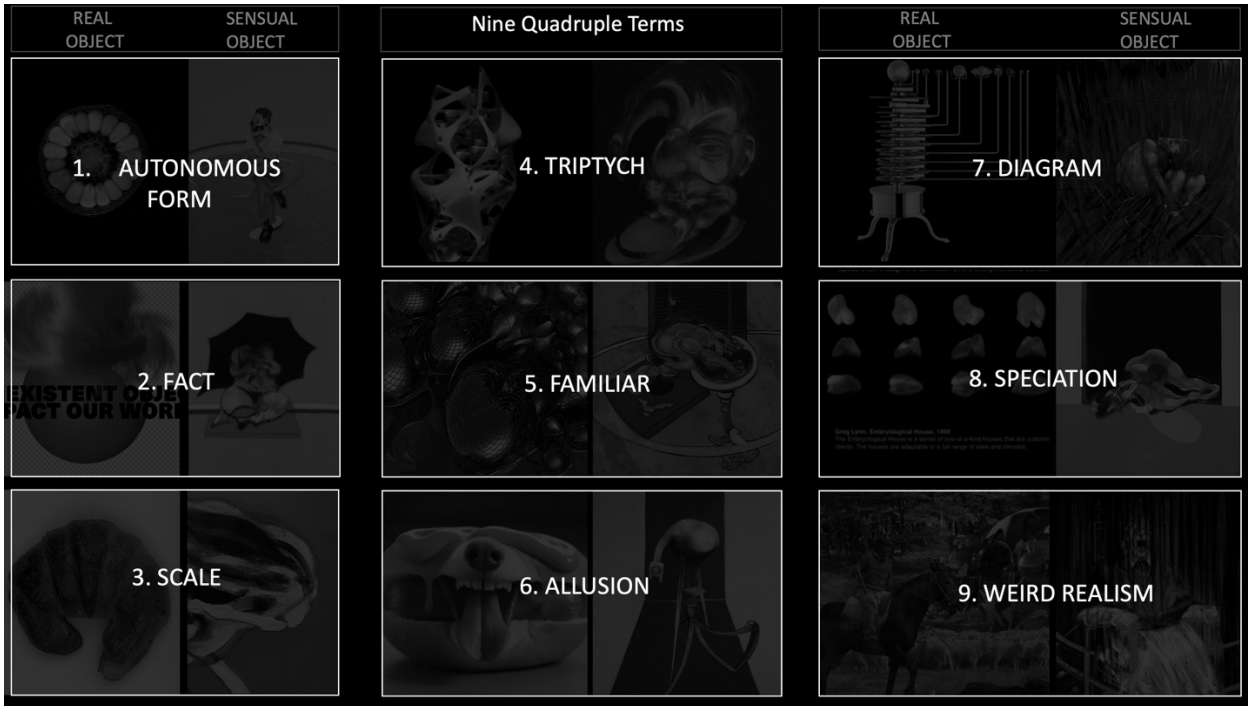




4.Conclusion: Abstract Diagrammatic Machine of nine (9) Quadruple Objects

Nine pairs of Real architectural entities and Sensual objects are generated to study a wider applied model. The proposal of this paper is to generate a **diagrammatic abstract machine with Objects, elements and traits of Francis Bacon's work to a speciation of Objects that connect through allusion.** Meaning all Francis Bacon Objects exist by far as Real Objects in a real Lieu-Place. They appear to us as Sensual Objects. But the 'whole' of F.Bacon exists somewhere far as a Diagram, as an abstract machine. Projections of his whole are the sensual objects, his paintings. They can alter and mingle based on Allusion to generate a Tool, an allusive realism, a smooth fluid 'mass'.

The whole of F.Bacon exists through the flat, coplanar relationship of objects (traits, figures, lieux, time, diagram, arrows, meat, smile, cages) as a whole Real Object. This is



his aesthetic identity, the aesthetics of the Real F. Bacon, his whole. His identity is recognized by the allusive organization of sensual objects to create the Realistic object of F. Bacon. After mixing, mingling and matching F. Bacon objects a Meta-Object is generated a new species for the analyzed Realism of F. Bacon.

This model of nine Quadruple[38] Objects can be applied to any Creator's work in order to extract its quadruple elements ad approach his work as a Realistic Object. This abstract machine – Diagram of nine quadruples is a Research Tool to Reinvent any given Weird Realism.

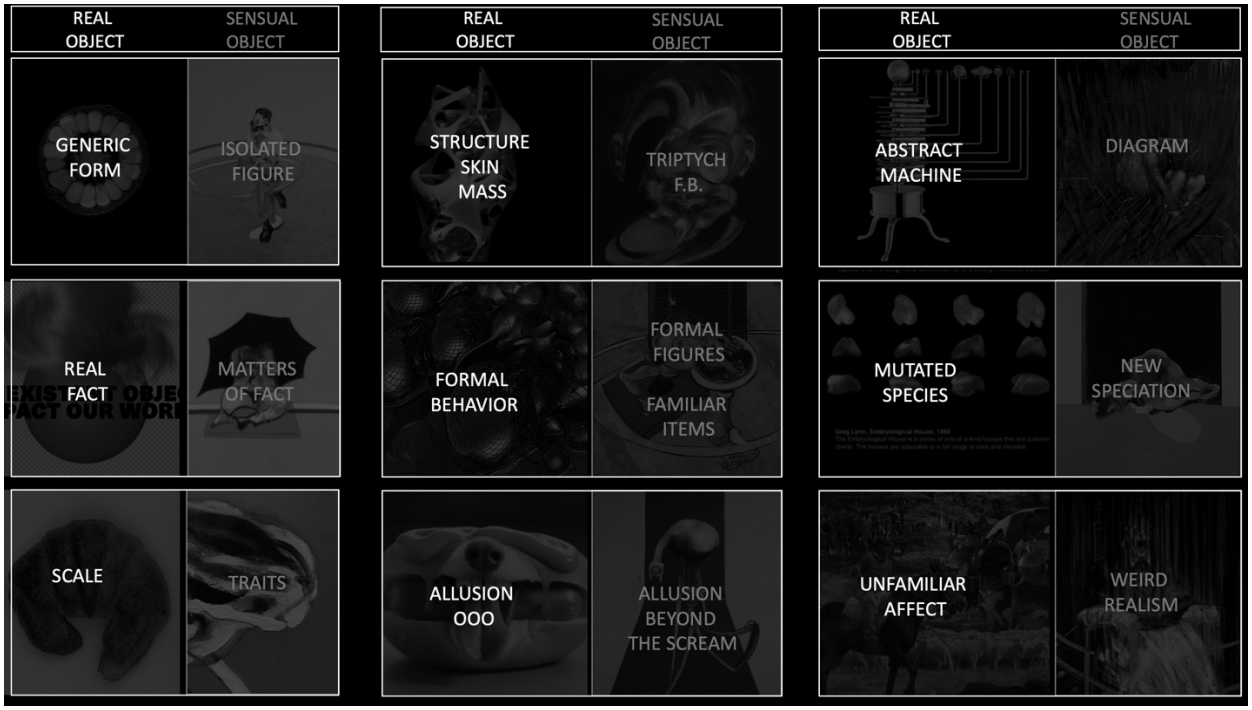
ABSTRACT MACHINE of nine (9) Quadruple Objects:

- **Pair 1: Generic Form – Isolated Figures.**
  Quadruple Object (n.1) analyzes the idea of **Generic Form** as a Real-istic Object. The Real Qualities of term 'Generic Form' are the qualities of a Diagram, of a self-contained system, of self-Context, of an Autonomous Form that redefines a new Context around it.
  In Francis Bacon paintings the idea of Generic Form is dominant through the **Isolated Figures** which are the Sensual Objects of this analysis. Autonomous figures in Bacon's work redefine Context of painting around them, order a certain Topos-Lieux like the round area, the ring, the rail, or the cube. The sensual quality of these figures is that they can be extracted of the painting without losing their entity, keeping the same independent meaning as isolated figures.
- **Pair 2: Real Fact – Matters of Fact**
  Quadruple Object (n.2) analyzes the idea of **a Real Fact**[39] in Object Oriented Ontology [OOO] as a Realistic Object. The Real Qualities of term 'Real Fact' are the qualities of a philosophical Lieux for meeting ingredients with autonomous existence. A Real Event forms a Real Object. The ingredients of a Fact do not have strong independent existence outside the Fact[40].
  In Francis Bacon paintings the idea of a Real Fact appears as what Deleuze calls '**Matters of Fact**' which are the Sensual Object of this analysis. Bacon's work has the sensual quality to stick to the Fact and develop non-narrative relationships between figures. Pure Form becomes an Icon, abstract Form sticks to the Fact, there is no figuration, no representation, no narrative. 'It is what it is'. Figure meets Lieux and the painting stands alone and is loud as a Fact.
- **Pair 3: Scale – Traits**
  Quadruple Object (n.3) analyzes the idea of **Scale** as a Real-istic Object under the notion of Autonomous Form. The Real qualities of Scale (not Size) is to be Free: Formal exploration generates Scaleless archi-

38 'Quadruple Object is a fourfold structure of two kinds of Objects and two kinds of qualities: Real and Sensual in both cases. Real objects and qualities exist in their own right, while sensual objects and qualities exist only as the correlate of some real object, whether human or otherwise. Since objects cannot exist without qualities and vice versa, there are only four possible combinations, indicated by the four lines between the circles of the fourfold scheme.' Graham Harman 's book 'Object-Oriented Ontology A New Theory of Everything p.52.

39 Graham Harman 's book 'Object-Oriented Ontology A New Theory of Everything p.52

40 The example of 'Beatles' by Graham Harman.



tectural Ideas regardless function, size or use. Oversizing does not allow to conceive the 'whole' but to spatially experience part of the Object.

In Francis Bacon paintings the idea of Scale appears through **Traits** which are the Sensual Object of this analysis. Bacon's work has the sensual quality of asignifying Traits. Meaning signs of horror, grotesque, nightmarish experienced only through a tactile perception of Art[41]. Traits can be sensed only as a close-up view where experience becomes scaleless.

- **Pair 4: Architectural Triptych – Bacon's Triptyches**

  Quadruple Object (n.4) analyzes the idea of **architectural Triptych** in Formal exploration as a Real-istic Object. The Real qualities of an architectural Triptych under the notion of formal exploration for autonomous Form is ***Structure – Skin – Mass***.

  In Francis Bacon paintings the idea of a **Bacon Triptych** appears through the idea of ***Field – Figure – Place*** which are the Sensual Object of this analysis. These are the three iconographic elements for Bacon 's work. Their sensual qualities are the Fields that function as ground, the Figures operating as form or facts and the Place as the Lieux, the round area, the ring or the contour which usually the border of the Figure with the Field.
- **Pair 5: Formal behavior | Formal Figures**

  Quadruple Object (n.5) analyzes the idea of **Formal Behavior** as a Real-istic Object. The Real Qualities of formal behavior are based on Time as a design tool. Secondary real quality of Formal Behavior is the concept of **familiar geometrical shapes** (such as a circle) within advanced topological mutated geometrical systems.

  In Francis Bacon paintings the idea of a **Formal Figure and familiar Items** are the Sensual Object of this analysis. They appear through the formal behavior of Athletic Figures, certain vanishing points of escape and familiar figurative devices such as umbrella, mirror and arrows. Their sensual qualities rely on **familiar elements** within substruction as a shocking spectacle for recognizing them within the unfamiliar object as a familiar element.
- **Pair 6: OOO Allusion | Chimera Allusion**

  Quadruple Object (n.6) analyzes the concept of **Allusion** as a Real-istic Object within the notion of Object-Oriented Ontology [OOO]. Allusion obtains the Real Quality to operate as a tool for *indirect access* to Real Objects' relationships.

  In Francis Bacon paintings the idea of Allusion is considered as the Sensual Object found beyond the Scream: mouths, teeth, hysteria, scream, hysterical distorted smile in **Chimera** figure. The allusion in Chimera figure implies there is a smile beyond the scream, and this smile is the Sensual Quality for this analysis. A smile Francis Bacon confesses he never got access to.
- **Pair 7: Diagram as Abstract Machine – multiple Realities through Allusions**

41 The Logic of Sensation του Gilles Deleuze, p.154 note 6+7.

Quadruple Object (n.7) analyzes the concept of Diagram as a Real-istic Object. The Diagram as **an Abstract Machine**[42] obtains the Realistic Quality to construct a new type of Reality. Speculative - allusive Diagrams (abstract machines for generating Typology) lead to multiple Realities (Real concrete assemblages for generating Topology). Diagram as an Abstract Machine is a link between Abstract and Real.
In Francis Bacon paintings the power of a Diagram is a Sensual Object that operates in an allusive way: Bacon can be translated through allusion, as an Abstract Machine that adapts to any Lieux. Repeats as autonomous Form after mutating or transforming an abstract geometry -conceptual geometry- like an autonomous system with internal rules. The idea of Diagram in Francis Bacon's work constructs **multiple Realities through Allusive Diagrams.** Sensual Qualities such as allusive signs, autonomous objects, diagrams of sensations organize his work. Diagram is the possibility of a Reality and not the Fact itself.

- **Pair 8: Mutated Species – New Speciation**
  Quadruple Object (n.8) analyzes the concept of **Mutated Species** and genres as a Real-istic Object under the notion of Autonomous Form. The singular repetition of a unit or the formal mutation of eternal growth are conceived as its Real Qualities.
  In Francis Bacon paintings **New Species** of the Figures are the Sensual Object. Within transformation Bacon reboots a re-enrollment of its appearance. Sensual Quality is conceived as the Redefinition of the Object.
- **Pair 9: Unfamiliar Affekt - Weird Realism**
  Quadruple Object (n.9) analyzes the concept of **Unfamiliar Affekt** therefor weird, as a Real-istic Object within a familiar Context. As a Real Quality there is this strange fleeting moment of a familiar object related to objects detached.
  In Francis Bacon paintings Weird Affekt -as a sensual Object- achieves to re-Invent Realism through Allusion. Sensual Qualities such as horror through allusion, grotesque but cute, horrific but sweet generate Weird Realism where there is no physical Realism. Realism is about the strange –weird- that is not projected onto Reality by us. Realism is 'already there' as a result of being real. It is a kind of Realism that doesn't have common sense.

The proposal of this paper is to generate the above diagrammatic Abstract Machine of nine (9) Quadruple objects, elements and traits of Francis Bacon's work that generate new Species of Objects connected through allusion. This relation through allusion[43] is the way to approach Reality and reinvent Weird Realism[44].

The nine pairs above are the Quadruple[45] Objects of Real architectural entities and Sensual objects generated to study a wider applied model. This Abstract Machine, the Diagram of nine Quadruple Objects is a research Tool to reinvent any potential weird Realism. This model of nine uses Artificial Intelligence techniques and processes and can be applied to any Creator's work in order to extract its quadruple elements and approach his work as a Realistic Object.

The final outcome of Francis Bacon as a Quadruple Object is generated by applying Artificial Intelligence techniques on his work. Artificial Intelligence techniques are not suggested to be applied in an indexical way. Suggestion is to use words that indirectly relate to the Object. The approach of Allusion again appears as a tool to Reinvent Reality.

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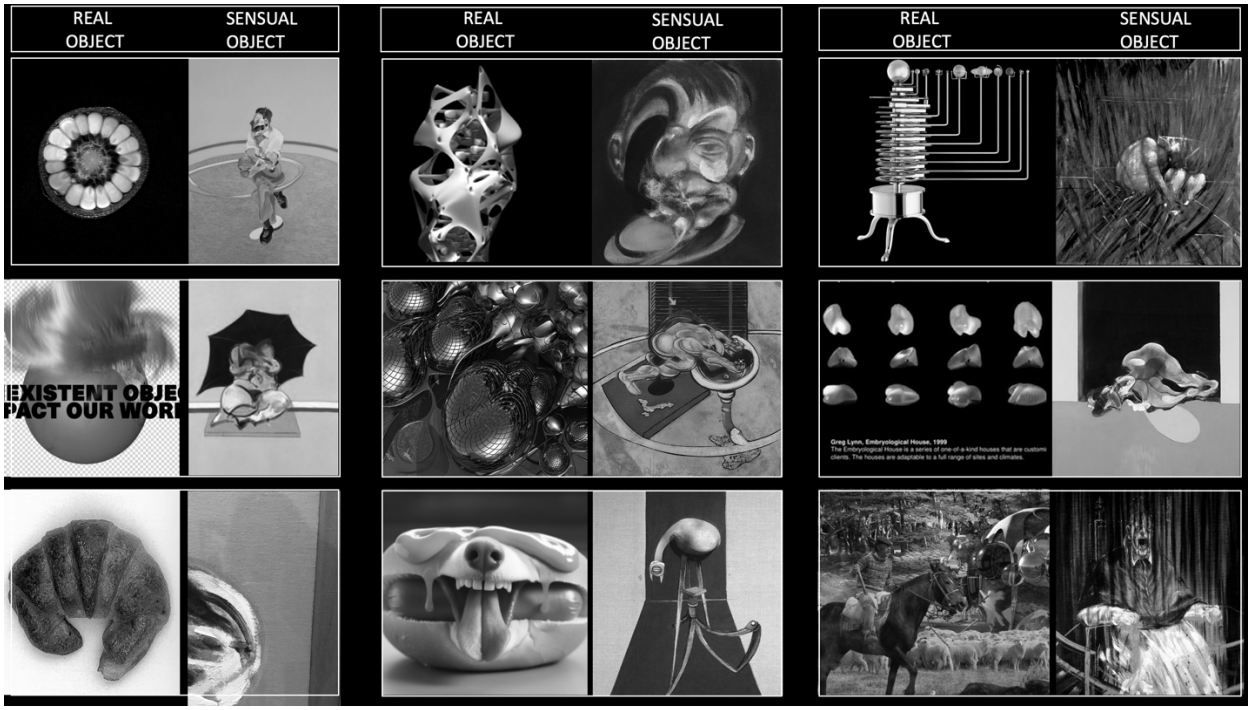
42 Abstract Machine as per Deleuze s thinking.

43 The key for this strategy is to rely on Allusion as the way to approach Reality and reinvent Weird Realism.

44 Francis Bacon claims that 'We have to reinvent Realism. There is no such a thing as Realism.'

45 'Quadruple Object is a fourfold structure of two kinds of Objects and two kinds of qualities: Real and Sensual in both cases. Real objects and qualities exist in their own right, while sensual objects and qualities exist only as the correlate of some real object, whether human or otherwise. Since objects cannot exist without qualities and vice versa, there are only four possible combinations, indicated by the four lines between the circles of the fourfold scheme.' Graham Harman 's book 'Object-Oriented Ontology A New Theory of Everything p.52.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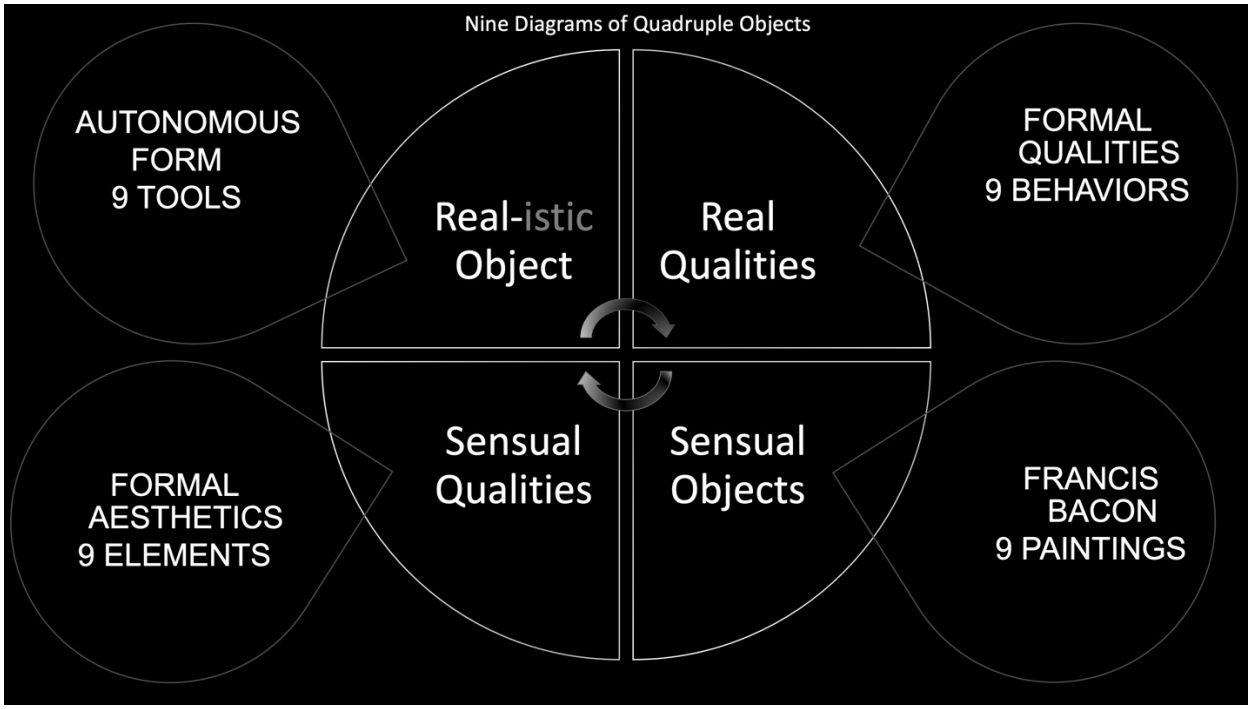
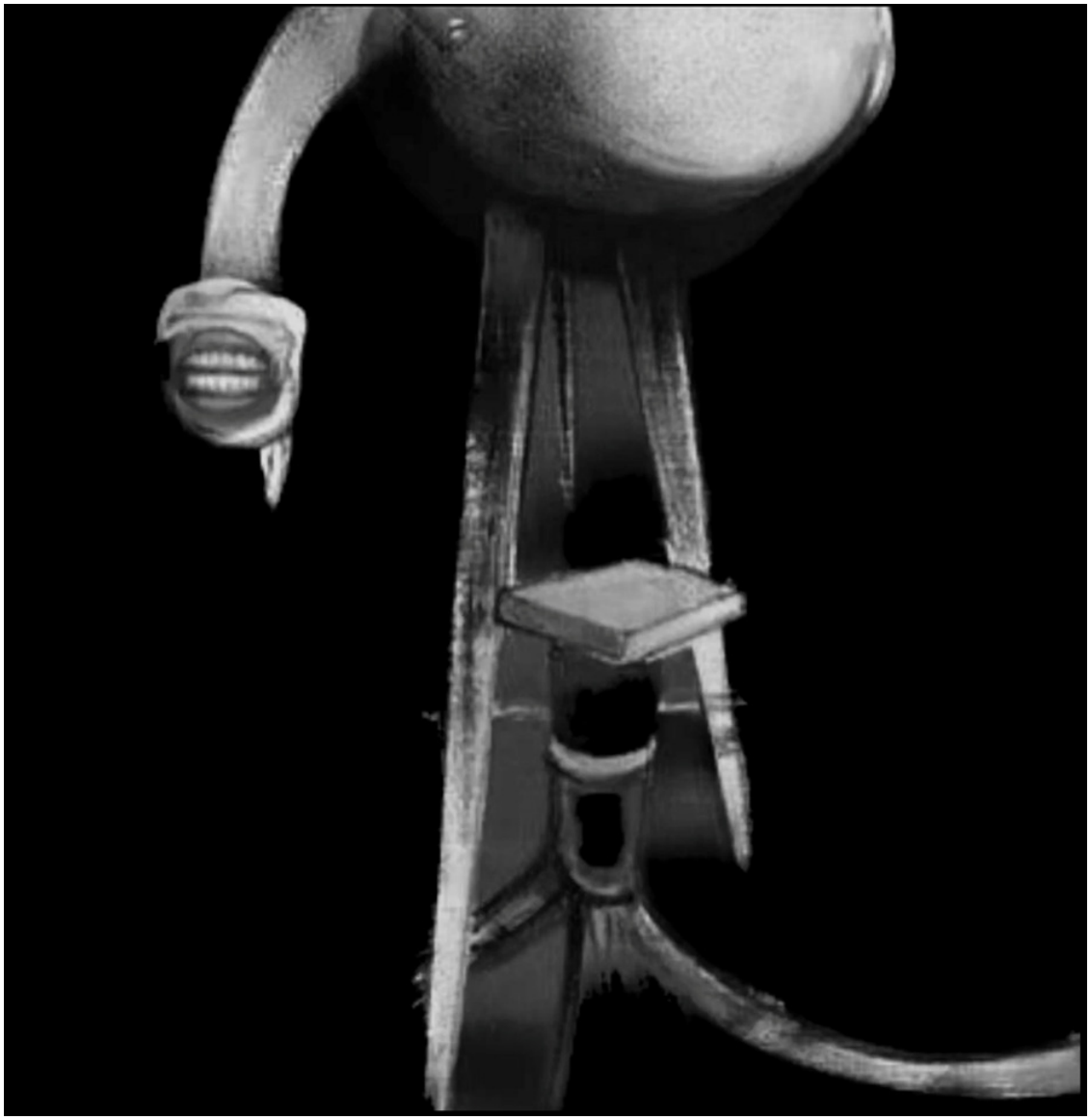
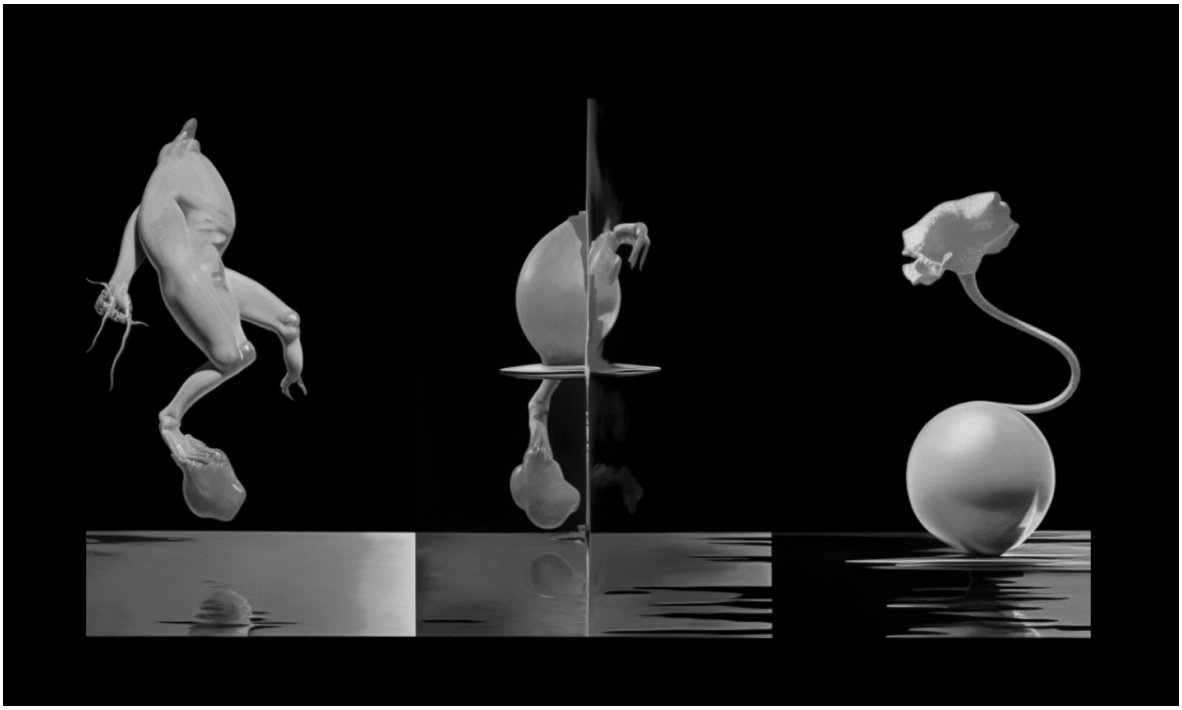
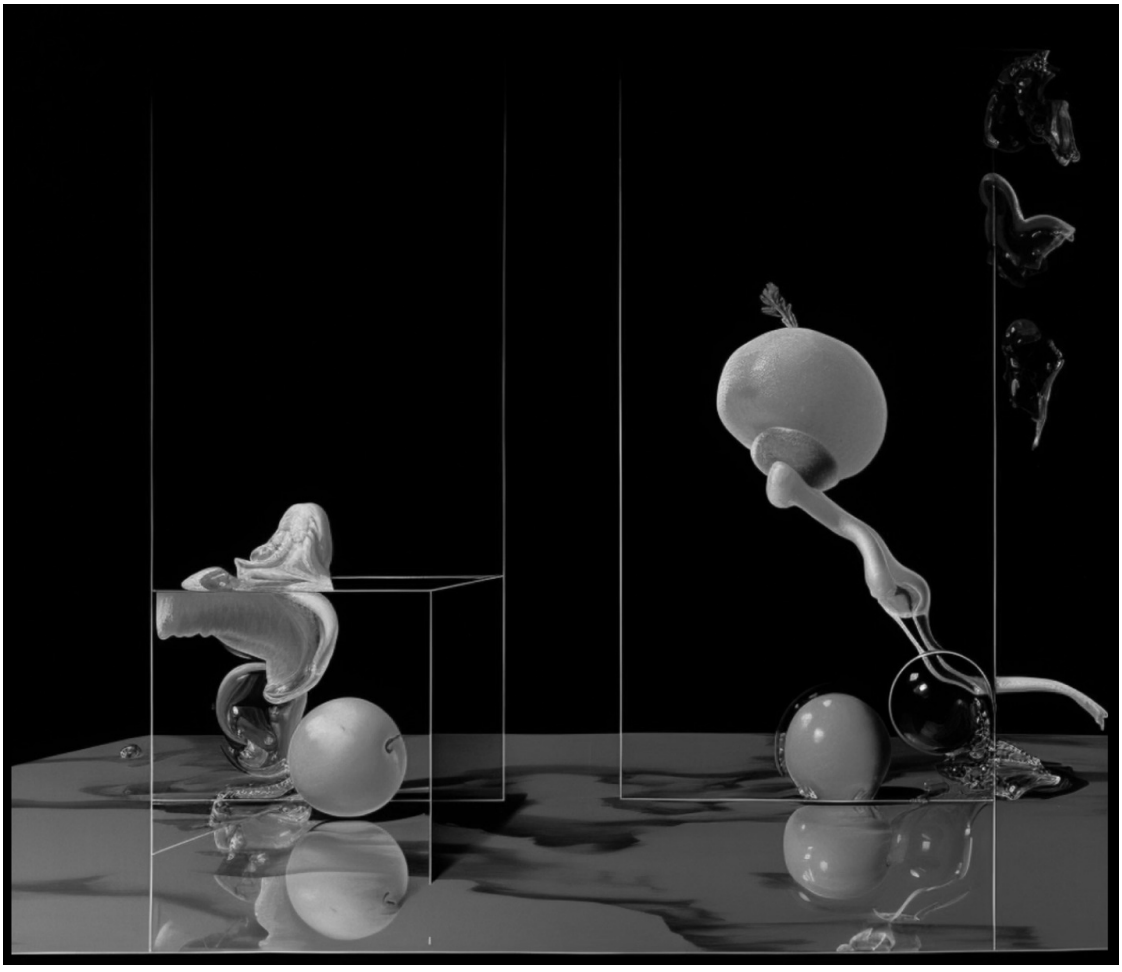

Nine Diagrams of Quadruple Objects
AUTONOMOUS FORM 9 TOOLS
Real-istic Object
Real Qualities
FORMAL QUALITIES 9 BEHAVIORS
FORMAL AESTHETICS 9 ELEMENTS
Sensual Qualities
Sensual Objects
FRANCIS BACON 9 PAINTINGS

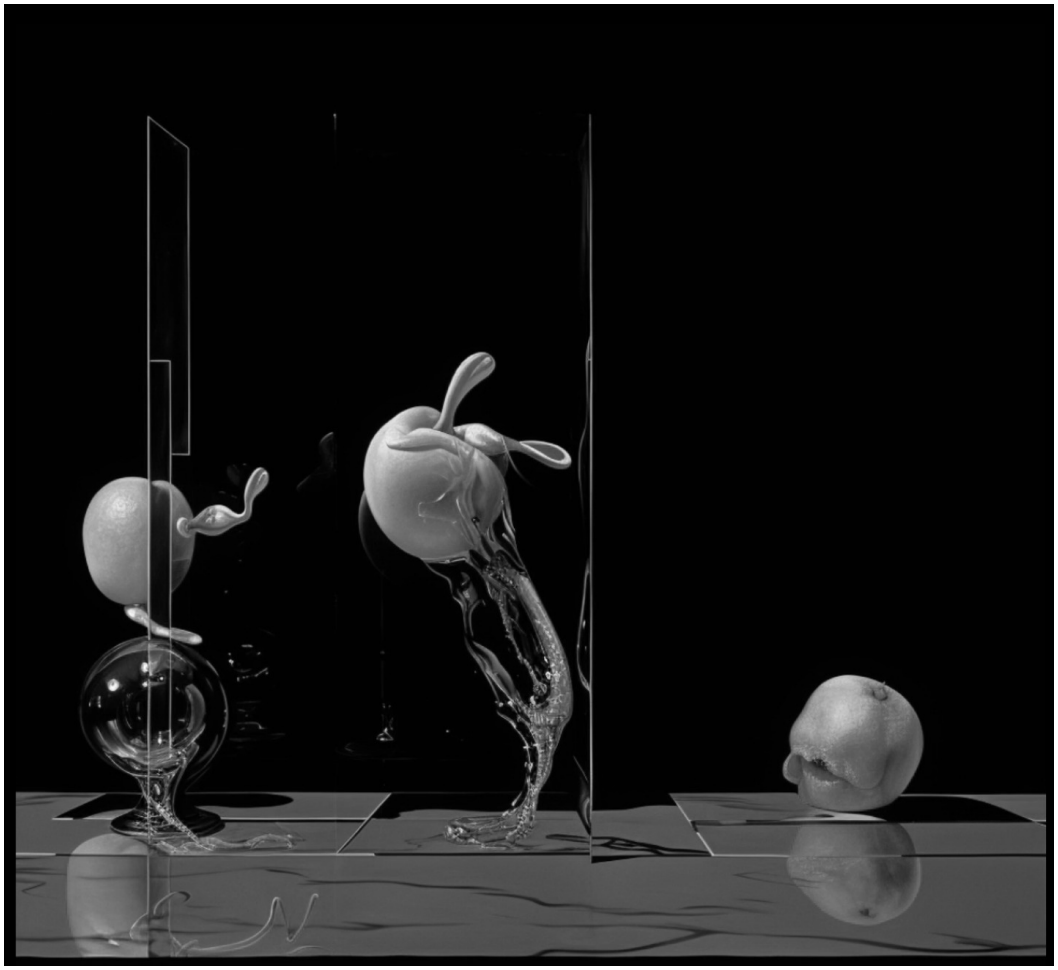
Stills from animation *'Ai Francis Bacon – Chimera'* :

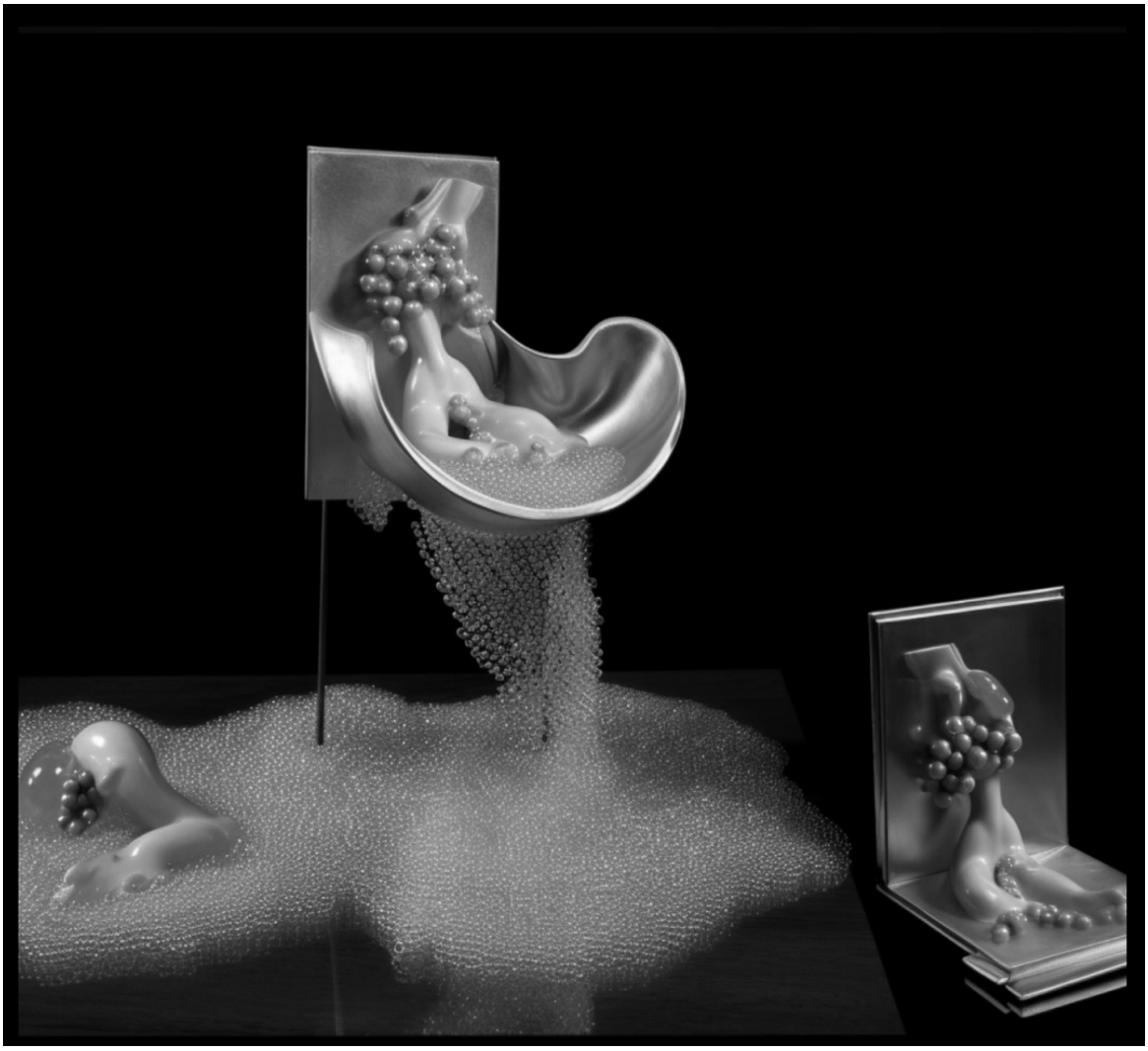
Submitted: January 15, 2024 BST, Accepted: February 10, 2024 BST

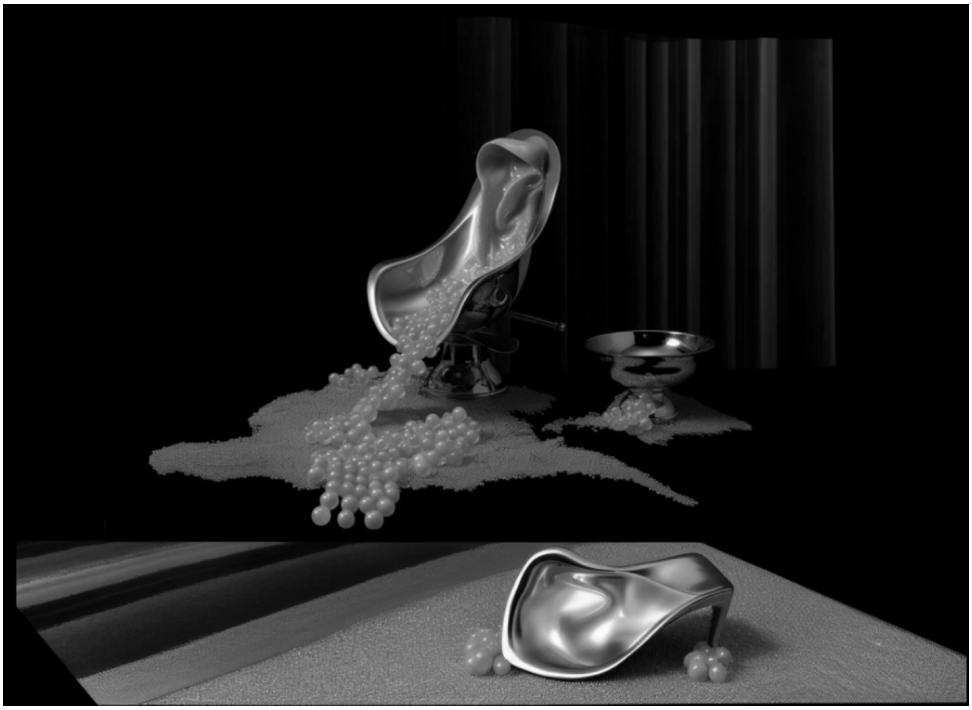












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archiDOCT 12 (1) Relevances

The Art of Storytelling Redefined: Artificial Intelligence and the Future of Architectural Visualizations

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Keywords: Artificial Intelligence, Creativity, Architectural Design, Text-to-image generators, Visualizations

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This paper explores the transformative influence of Text-to-Image (TTI) generative artificial intelligence (AI) on architectural visualizations, posing a critical inquiry into whether it serves as an optimized visualization tool or signals a paradigm shift in architectural design methodologies. Tracing the evolutionary path of TTI models—from early generative adversarial networks to contemporary diffusion models—the study underscores their integration into architectural workflows. Emphasizing the synergy between human creativity and AI insights, the research advocates for a redefined approach to conceptualization, self-knowledge, and collective imagination in design. Through iterative explorations, architects engage in a dialogue with TTI systems, fostering self-discovery and refining design identity. The paper further explores TTI's potential in stimulating creativity, drawing parallels to surrealistic collage practices, and challenging designers to venture into unexplored conceptual realms. The study concludes by highlighting the hyper-dimensional nature of Text-To-Image generation, while unraveling the intricate web of authorship in the AI creative process, recognizing the intertwined roles of humans, engineers, algorithms and vast datasets. While emphasizing the imperative need for ethical frameworks, the paper acknowledges that Text-to-Image technology has the potential to stimulate architectural imagination in unprecedented directions, functioning as a catalyst for creativity rather than merely serving as a visualization tool.

1. Introduction

Text-to-Image (TTI) generators, fueled by generative artificial intelligence, have become a focal point of fascination across various creative disciplines (Oppenlaender, 2022). These innovative tools possess the capability to translate textual descriptions directly into visual representations, ranging from realistic scenes to imaginative concepts. This technological advancement has sparked significant curiosity, particularly amongst the field of design and architecture, signaling a departure from conventional visualization techniques.

The allure of Text-to-Image generators lies not only in their ability to bring textual ideas to life but also in the profound questions they raise about the creative process. Beyond serving as mere tools for visualizing predefined concepts, these generators are positioned as potential catalysts, influencing not only the visual aspects of design but also the very methodology and cognitive processes employed by architects. This explorative study lays the groundwork for a deeper examination of how text-to-image generators may reshape workflows, narratives and ways of thinking in early stages of conceptual design.

a Styliani (Stella) Salta is an architect and computational designer. Her research focuses on the confluence of Architecture and Artificial Intelligence, concentrating on generative design, and the strategic integration of data science and machine learning methodologies within the realms of Architecture and Digital Arts.
She is actively engaged in the fields of digital fabrication and data-driven design, challenging conventional anthropocentric paradigms of creation. Her work reflects a dedication to exploring speculative notions of design, embracing self-organization practices, and tapping into the creative potential of non-human entities. Through these approaches, she seeks to amplify collective creativity, expand imaginative capacities, and refine problem-solving methodologies.
She graduated with a diploma in Architectural Engineering from the Polytechnic School of Artistotle University of Thessaloniki (Greece) in 2018. Her postgraduate studies include an MArch from NTUA School of Architecture and an MSc in Data Science and Machine Learning from NTUA School of Electrical and Computer Engineering. Currently, she is a PhD candidate at the National Technical University of Athens, School of Architecture, actively contributing to the evolving discourse at the intersection of architecture and advanced technologies.

2. Objectives

Departing from the main research question, discerning whether text-to-image generators represent a new visualization tool or signal a paradigm shift in design methodologies, there are three main objectives to be investigated when looking into the potential of these tools:

- **Redefining Conceptualization**
  Can Text-to-Image generators transcend their conventional role as visualization tools and actively contribute to the conceptualization process, reshaping architects' approaches to conceiving and formulating design ideas?
- **Unleashing Self Knowledge**
  In what ways do Text-to-Image generators serve as catalysts for self-discovery in architectural design? How do they enable architects to explore their creative potential and deepen their understanding of the intricacies of their own design thinking through iterative engagements?
- **Acknowledging the Influence of Collective Imagination**
  How does the collaborative nature of creative thoughts, facilitated by Text-to-Image models trained on extensive datasets of various creators' works, contribute to fostering creativity within distributed cognition? To what extent does this process form the foundation for innovative architectural expressions by tapping into a shared creative consciousness?

Looking into the aforementioned objectives, this study proposes an evaluation framework for practitioners and creatives, positioning text-to-image generators as tools for concept articulation. The main parts of this framework are:

- **Iterative Explorations**
  Text-to-image generators streamline the iterative design process, empowering designers to experiment and refine their ideas effortlessly. The emphasis is on reducing effort while facilitating idea iteration and maintaining the quality of design evolution.
- **Workflow Transformation**
  The study suggests mapping of the design process to understand how these tools reshape workflows in architectural practice. The pivotal shift occurs as they enable the exploration of concepts through high-definition visualizations, advancing photorealistic presentations in the workflow beyond their current stage and eliminating the need for preliminary design, time investment and effort.
- **Creativity and Concept Making**
  Exploring the potential of these tools to foster genuine creativity. Drawing inspiration from surrealistic collage techniques, to examine unconventional cases that challenge architects to think creatively. The aim is not merely rapid architectural rendering but leveraging the TTI generators to enhance creative thinking and conceive innovative spatialities.

3. Text-to-Image AI

The integration of such tools into design workflows necessitates a fundamental understanding of their inner logic and evolution in the field of artificial intelligence (AI). Generative AI is a subfield within the broader realm of artificial intelligence that focuses on the development of systems capable of creating, generating, or producing new content autonomously. Unlike traditional AI approaches that often rely on explicit programming and rule-based systems, generative AI leverages advanced machine learning techniques, to enable systems to learn and understand patterns within vast amounts of data – or in a more precise description, built semi-reliable statistical correlations of information relationships found in the given data (Bernstein, 2022). The hallmark of generative AI is its ability to generate novel outputs, such as images, text and multimedia by "learning" from those datasets. (Goodfellow et al., 2020)

A demonstration of generative AI's prowess is witnessed in text-to-image (TTI) generation. TTI refers to a technology that involves the generation of visual content, such as images or graphics, based on textual descriptions or prompts. TTI operates by utilizing advanced deep learning models, trained on extensive datasets containing pairs of text and corresponding images, enabling them to learn the intricate relationship between textual descriptions and visual elements (Chaillou, 2022, p. 30). As a result, Text-To-Image systems can automatically generate high-fidelity images that closely match complex text descriptions. The synergy between generative models and large language models has played a pivotal role in enhancing the performance of TTI generation (Koh et al., 2023), often blurring the lines between human-created and AI-generated visual content. The most effective TTI algorithms have generally been trained on massive amounts of image and text data scraped from the web. Some of the most popular TTI models available online include: DALL-E by OpenAI, Imagen by Google Brain, Stable Diffusion by StabilityAI and Midjourney.

4. Brief history of TTI evolution

The evolution of TTI models is marked by the advent of deep learning in image generation around 2015 (Zhang et al., 2023). Generative adversarial networks (GANs) served as the primary backbone for TTI models, efficiently producing images through a generator-discriminator structure. GANs operate in tandem. The generator creates new data samples mimicking the training data, while the discriminator distinguishes between real and generated data. These networks undergo joint training in a zero-sum game, where the generator aims to create increasingly realistic samples, and the discriminator identifies fabricated ones. This process continues until the generator achieves the ability to generate data samples indistinguishable from authentic ones (Goodfellow et al., 2020). Through the collaborative training of these networks, GANs can develop the capability to generate high-quality images closely resembling those found in the real world.

Over time, researchers explored various architectures for text-to-image generation, leading to the emergence of autoregressive models and later on the diffusion model. Autoregressive models, also belonging in the domain of deep learning, are a category of models useful for generating images from text. These models operate by predicting each pixel in the image individually, using information from the previous pixels. Essentially, the model sequentially generates the image, with each pixel being produced based on the information gleaned from its preceding pixels (Shih et al., 2022). This approach mirrors the way humans draw images, initiating the process with a basic sketch and progressively adding finer details.

The latest approach involves diffusion models. They operate through an iterative diffusion process applied to a noise vector, progressively shaping this noise into a coherent image. The dynamics of this diffusion process are governed by adjustable parameters fine-tuned during training to ensure the production of high-quality images (Saharia et al., 2022). This methodology allows for a controlled and gradual transformation, wherein the noise vector evolves into a visually meaningful representation, thereby bridging the gap between textual information and visual output.

The ongoing exploration of different TTI model types, considering factors like model size, time efficiency, and image fidelity, illustrates a dynamic and competitive landscape in the development of AI-generated images. This journey has made TTI generation a focal point of discussion within the broader field of AI generated content. Despite the diverse models and methodologies employed by the research community, the user interface designed for interaction remains exceptionally simple. Users engaging with TTI models are not required to possess knowledge or comprehension of the underlying workings of the aforementioned algorithmic models, nor do they need any drawing or artisanal skills. From the user's standpoint, all that is essential is a prompt—a concise textual description of the envisioned image outcome. The ease of use has contributed to the widespread popularity of TTI across diverse users and disciplines, prompting exploration and integration attempts in various fields, as these systems offer new possibilities for creative expression and cutting edge, photorealistic visualizations, requiring minimum amount of time and effort.

Design and architecture, have embraced TTI generators with curiosity and both excitement and skepticism (Albaghajati et al., 2023). The allure of achieving photorealistic results in seconds, a task traditionally time-consuming, seems to intrigue designers to a great extent. As TTI usage is still evolving, lacking rigid protocols or standardized implementation methods, designers engage in experimentation to uncover the potential outcomes of interacting with these tools. Therefore, a lot of research interest emerges among this area in order to evaluate the prospects of it (Paananen et al., 2023), hoping that generative tools can enrich the design process by facilitating serendipitous discovery of ideas and nurturing an imaginative mindset.

5. Self-Knowledge through Iterative Explorations

As stated above, creating images with AI visualization tools takes place in very user-friendly interfaces and may seem quite straightforward initially. Users describe their desired image in natural language, specifying details like format, context, and subject matter. However, this process is not always as linear as expected. Achieving the desired outcome requires users to assess the output and refine the initial prompt until they discover the precise combination of words that conveys their vision. This transforms the process into a dialogue, an ongoing exchange between the user and the algorithm to attain the desired creative outcome. In the area of neural architecture, this technique allows shape to be interrogated through language (del Campo & Manninger, 2022).

This process introduces a dynamic interplay between the designer and the AI platforms, posing two critical questions. Firstly, there's the challenge of effectively conveying the designer's mental image through words. Secondly, it questions whether the AI accurately interprets and comprehends these verbal descriptions. The act of describing ideas with words transforms into a design process itself, fostering a continuous exchange. In this back-and-forth, the designer experiments with prompts, evaluates image results, and iterates on the process.

"Iterating" is an intrinsic part of design (Wynn & Eckert, 2017). Ideas and concepts find their form by molding through the laborious process of re-thinking, re-evaluating, re-sketching until one reaches the point where satisfaction and certain criteria are met. This way of operating is common in most designers. Through all these iterative steps, many variations of the project are being produced as part of the design and conceptualization process. This methodology of creation holds strong similarity with the way someone uses and explores ideas in AI generator platforms (Joyce, 2021). One can feed the same prompt into the algorithm and get different results. In advance to that, several platforms generate variations within the same prompt (Midjourney), providing the choice to the user to pick and re-iterate on the one that is deemed more preferable – somehow guiding them to their ideal outcome. AI's ability to quickly generate visualizations can play a key role when "iterating" on architectural design. The capacity to generate alternative design possibilities effortlessly is encouraging architects to explore new ideas and experiment with concepts and forms.

Crafting the 'perfect' prompt becomes an art of posing the right questions. It demands an understanding of effective communication with the AI, selecting keywords that precisely express intentions. Architect's engagement with different iterations reveals personal preferences, and self-knowledge emerges from recognizing design inclinations and biases. This interaction serves not only to refine the user's concepts but also to enrich and shape their design identity. The designer refines prompts to better convey their vision, creating a symbiotic relationship between human creativity and machine-generated insights. The focus extends beyond the final high-fidelity image; it encom-

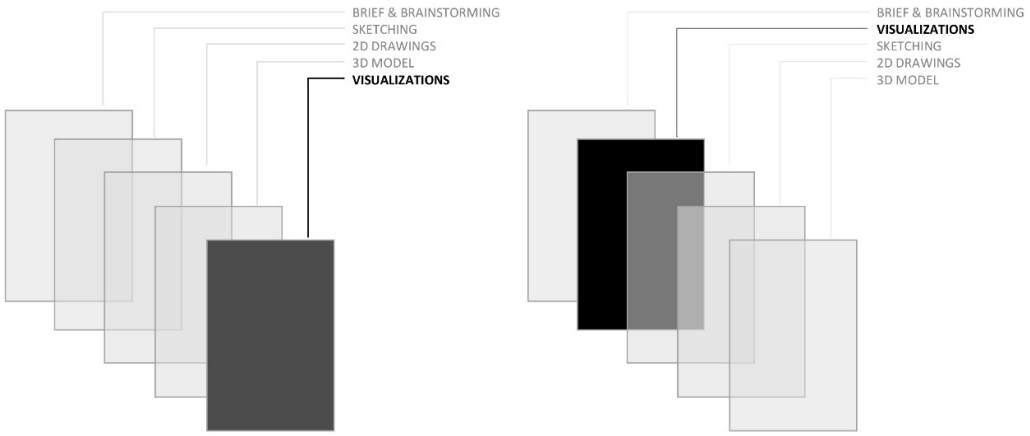

Figure 1. "William Garner's visualizations on architectural concepts, produced via natural language descriptions using text-to-image generators (2022). The initial variations were produced using Midjourney and targeted editing took place using DALL-E 2. "

passes the evolving interaction with the tool, providing a new approach to self-reflection and concept articulation.

6. Workflow Transformation

In the field of architecture, the journey from conceptualization to construction involves navigating through various stages, each with distinct objectives. Architects lean on specified structured workflows to guide them through these phases (RIBA, 2021), with the technical aspects demanding a more rigid process, while the early stages allow for a flexible approach driven by creative thinking and intent.

The integration of digital design tools and photorealistic rendering into the design process has prompted architects to utilize visualizations for effective communication with clients, engineers, and other stakeholders. Achieving a photorealistic image entails a sequential process that essentially involves designing the building to a certain extent. While not a strict protocol, a common practice involves creating a brief, conceptualizing an idea, drafting initial sketches manually or digitally, progressing to resolving drawings and synthesizing the building, and finally constructing a 3D model as the foundation for photorealistic images.

However, a notable shift is occurring with the emergence of text-to-image algorithms powered by generative AI. These algorithms enable architects to provide a textual description of a building, generating remarkably realistic results in a short span of time, usually within seconds. This algorithmic approach appears to almost instantaneously design a structure, complete with materials, textures and atmospheric qualities, offering a glimpse into the potential look and feel of the space. Therefore, the ability to introduce and experiment with early step visualizations prior to sketching, drawing and modeling any actual building can be seen as an opportunity to explore concepts and ideas without investing time and effort that would otherwise be prohibitive. This approach can be implemented into several stages of the design process including 1) General Study/ Analysis with attention to storytelling and visual representations 2) Ideation/Synthesis with references and design inspirations and 3) Design development with multimedia and presentations. (Albaghajati et al., 2023)

The appeal of effortlessly acquiring impressive images might create a misconception that design is confined to the final visual representation alone. The risk is succumbing to cinematic effects without substantial design input, echoing a long-standing issue with the use of photorealism in design (Nastasi, 2016). However, portraying the integration of these tools as a threat (Leach, 2023) pushes us towards asking different kind of questions. Design is inherently multifaceted, and the potential of these tools to deliver exceptional results doesn't hint at an upcoming automation utopia. Instead, it encourages designers to view it as an opportunity—an open question challenging them to explore integration methods that enhance rather than undermine the design process.

One can certainly argue that text-to-image AI models and the features they offer can optimize production time in renderings using automation. The broader question is poses is looking into how- and if - it can be implemented into concept design stage to augment our capacity of creative thinking, rather than just facilitating photorealism.

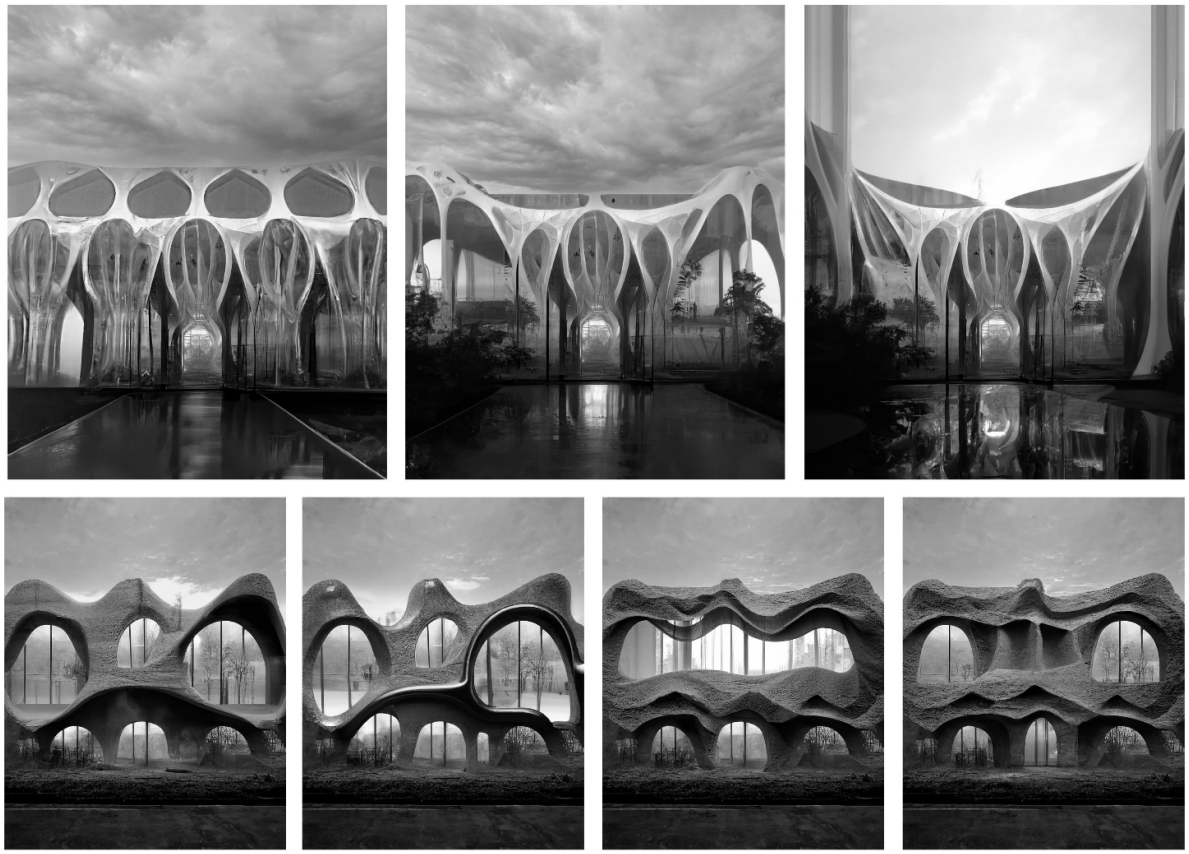

Figure 2. "The shift of visualizations' implementation during common architectural workflows at concept and schematic design stages."

7. Creativity and Concept Making

As discussed above, one effective application of text-to-image AI generators is streamlining time-consuming tasks, particularly in the refinement of "rendering" and the creation of photorealistic visualizations, which were traditionally perceived as laborious and time-intensive tasks. More than that, the iterative nature of engagement with such tools showed the ability to enhance a designer's self-reflective approach in design. But more than that, do these tools possess any potential to fundamentally reshape the way we approach design thinking? Rather than simply expediting established practices, can these tools inspire novel ideas and creative concepts that may not have emerged through conventional methods? This inquiry challenges us to explore the transformative possibilities that extend beyond time-saving measures and consider whether these tools contribute to a more profound evolution in our creative processes.

In architecture, referencing and quoting from the past to inform new designs has been a longstanding practice, notably embraced by post-modernist architects who creatively reinterpret historical architectural forms within their own work, challenging notions of originality and authorship. This approach serves as a form of meta-representation, reflecting upon the act of representation itself. When algorithms in text-to-image visualizations are trained to understand and interpret concepts, they essentially create a representation of them. Subsequently, they translate these representations into visual images. This process constitutes a second-level representation, where the original representation is reconsidered or represented anew. This mode of operation, characterized by referencing, quoting, and critiquing existing architectural forms and ideas, aligns with what can be termed as content-aware metarepresentations (Moras, 2020). The aim of content-aware metarepresentations is to engage with architecture's historical and theoretical heritage while exploring fresh interpretations and expressions within established frameworks.

Therefore, the main objective here is far from asking if AI can itself be creative. The big question is how can we get more creative by implementing such tools into our workflows, moving beyond the fear we shall be amputated by them. The scope is to pay attention to the ways we can utilize these tools to extend and expand the notions and ideas we already have, and see ourselves as augmented entities of creativity. Do such tools have the capacity to impute and ignite more creativity into our thinking or the way we use them only iterates and reflects on our very own human creativity? If the latter is the case, then one should consider such tools only as means for time efficiency and optimization in our creative production.

Exploring the alternative perspective, the proposed methodology draws inspiration from the creative practices of the surrealists, particularly the art of surrealist collage. Surrealist collage is a technique that enables artists to

swiftly combine and juxtapose pre-existing elements, be they words or images, to shape entirely new compositions. This seemingly irrational combination of disparate elements mirrors the construction of dreams, where unrelated elements converge to form peculiar narratives and scenes. (Cramer & Grant, 2020) The Surrealists viewed collage as a method to enact what they deemed the fundamental poetic activity of the unconscious mind: the fusion of diverse entities to generate something entirely novel. The Surrealist approach to collage manifested unconscious thought, serving as a conduit to authentic creativity. While these algorithms don't function precisely like collages, as they are trained to learn concepts via associating text to images (a process analogous to a child's learning), the objective is to leverage the concept of assembling irrational conceptual juxtapositions. These can serve as means of defamiliarisation and estrangement, offering the opportunity to observe the world differently than it is commonly understood or perceived (del Campo & Manninger, 2022). By experimenting with these juxtapositions on AI platforms, the aim is to explore how they can potentially deliver novel concepts and show genuine creative potential.

The example of the "elephant-fly" offers an introductory investigation, using a metaphorical language approach to explore unconventional ideas. It starts with portraying a large mammal as an ethereal being flying in the skies and refines the prompt to introduce a cross-breed animal species resulting from merging an elephant and a fly. While the initial idea is easy for humans to grasp, the latter concept demands a degree of unconventional thinking that may prove challenging even for the creative human mind. The juxtaposition that may perplex human creativity is effortlessly rendered by text-to-image AI, underscoring its capacity to generate imaginative constructs. The instances presented illustrate the algorithm's ability to seamlessly combine apparently unrelated ideas and blend elements from different taxonomies to craft imaginative visuals.

This approach doesn't exclusively depend on employing text-to-image AI; it can also be executed through traditional analog methods, a common practice in a designer's workflow. The age-old practice of "gathering references" when delving into a design problem, creating an inspiration board, and outlining design objectives is a well-established creative method. As life becomes more intricate, designers increasingly gather diverse and unconventional references, which can connote various elements like style, aesthetics, historical significance, material technology etc. For instance, let's consider a design concept integrating mycelium (a fungus with notable structure and mechanical properties which has been experimentally used as a construction material) either as a material or as a source of inspiration for structural formation. Suppose the same design concept aims to capture the qualities of a specific style, motion or expressiveness inspired by the Baroque movement. To illustrate, below are some reference images a creative individual might have collected. How might these references be translated into design ideas integrated into a spatial approach? Through an exploratory design process, a designer can follow the traditional path using sketches, models, and the unlimited source of creative thinking.

Can text-to-image models facilitate a smoother transition from design references to spatial concepts, or even generate new "synthetic" references to expand the creative thinking of the designer? (In this context, "synthetic" denotes references not derived from real-life instances or existing works but rather created by algorithms.) The aim is to provide the algorithm with a prompt equivalent to the analog concept board's brief, seeking specific characteristics and qualities for the envisioned space. The generated images would then serve as an enriched concept board, showcasing initial digital spatial sketches – not a final photorealistic outcome. This approach harnesses creative visualization before embarking on any actual design steps, presenting potential scenarios that might escape the human mind.

Notably, there is an inherent loss of control in this process. The outcome from the algorithm remains unpredictable. Yet, it is within this uncertainty that the potential for creativity unfolds. Here, the designer willingly embraces an open-ended approach, allowing for the exploration of uncharted territory in the design process. Understanding the genesis of these tools allows for more meaningful integration into design workflows. Rather than being led by the technology, designers can leverage it to explore visions that might otherwise escape their purview. In essence, the medium becomes a conduit for design intention, capable of yielding both mundane and insightful results, hopefully surprising the designer with unforeseen possibilities.

8. Conclusions and Considerations

Can the generation of something "new" emerge from existing frameworks of creation? The approach to conceptual design in this manner poses a risk of disrupting the coherence and continuity of a design's conceptualization, potentially yielding a disjointed, fragmentary, and chaotic outcome. This risk is amplified by the absence of historic or social context in algorithmic creation and the blurred ethics associated with the massive datasets used to train these TTI algorithms. Critics argue that merging established aesthetic approaches with prompt-based images may lack the potential for true creativity and originality, as the process may be confined to replicating the work of other artists.

Considerations also surface regarding the interpretation of abstract concepts. Algorithms might represent the statistical average idea of "spatial expressiveness" based on their training data, potentially reflecting a specific cultural perspective (Naik & Nushi, 2023). Addressing such concerns necessitates a well-informed and sensitive approach from the research community and practitioners. It is crucial to establish ethical boundaries and understand the biases inherent in these creation workflows while also recognizing the power of collective imagination they offer to an open commons design community. Under certain conditions, these tools can foster creativity within the realm of distributed cognition and the synergy of collective imagination, laying the groundwork for innovative architectural expressions.

Figure 3. "Elephant flies VS Elephant fly: Evaluating the creative potential of text-to-image generators, by implementing surreal concept descriptions and playful language games. The images were generated using Stable Diffusion 2.1, a text-to-image model from StabilityAI."

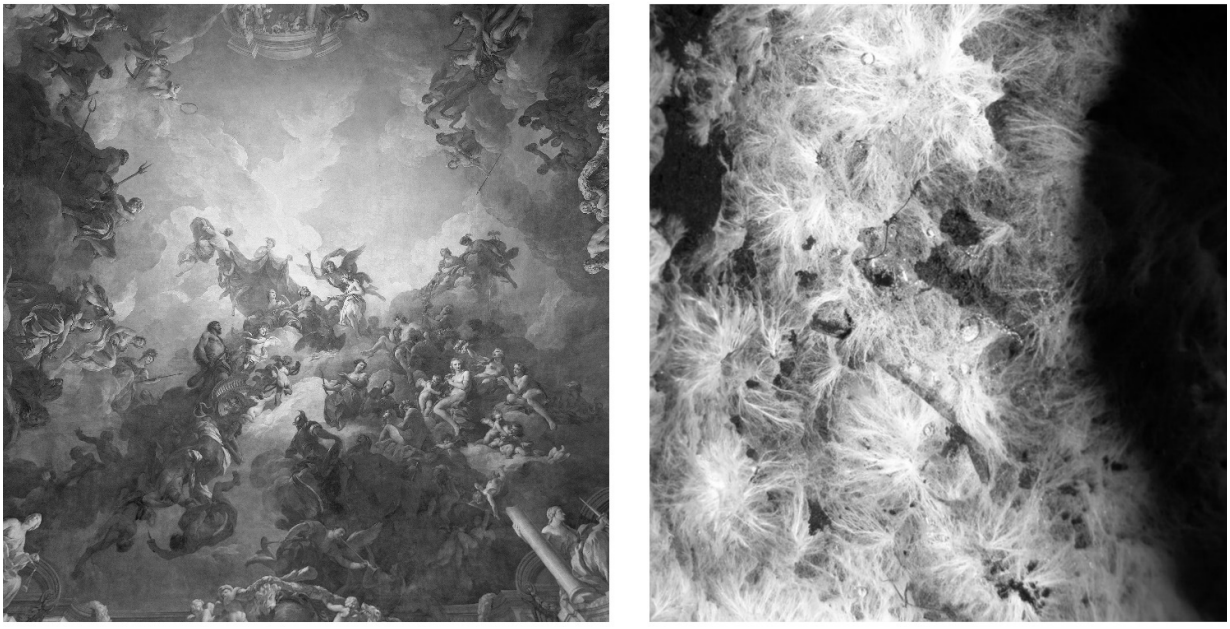

Figure 4. "Baroque Mycelium: Real life references collection for conceptualization of creative concepts. (Left: The Apotheosis of Hercules, baroque painting by François Lemoyne) (Right: Close up image of mycelium fungi structure.)"

Moreover, the concern that these tools merely reproduce old information without the capacity to pave the way for something new can be reconsidered. Alongside their unprecedented processing speed and graphic quality, these associative mechanisms hint at the potential for establishing a new creative approach characterized by a sense of "hyper-dimensionality". Since these algorithms are trained on datasets comprising myriad images from every historic era, they draw complex connections across a symbolic order that traverses time (Vickers & McDowell, 2021, p. 19). We

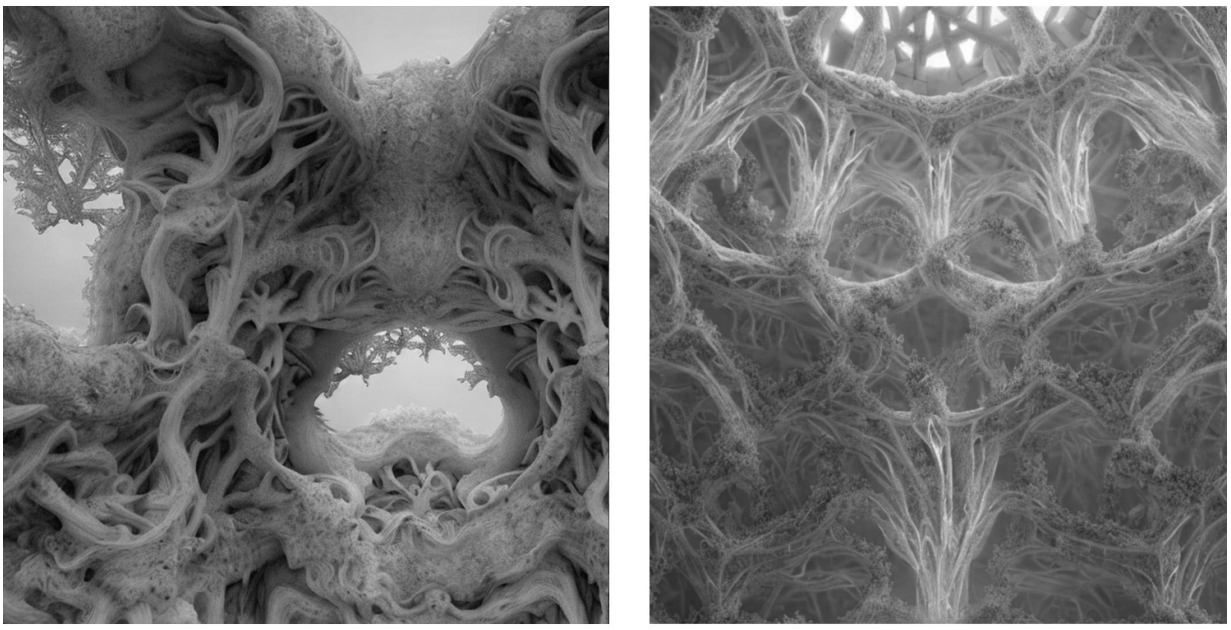

Figure 5. "Baroque Mycelium: Synthetic images produced with prompts including the keywords “baroque”, “mycelium”, “architecture”, “expressiveness”, “aggregations”, “spatiality”. The images were generated using Stable Diffusion 2.1, a text-to-image model from StabilityAI.

are witnessing the birth of a creative mechanism trained on the collective artistic knowledge of everything that has ever existed, capable of interacting simultaneously with the past, present, and future. Experimenting with these tools not only allows us to unlock new creative trajectories but also enables meaningful self-reflection, encouraging us to look back at cultural history and design in new ways. At this point, the idea of “collective imagination” is closely linked to “collective intelligence”, which is no longer just a human phenomenon but is increasingly mediated and enhanced by technology (Morel, 2022). This technology does not just augment human intelligence but becomes an integral part of a new kind of collective intelligence and creativity that operates on a global scale, involving both humans and machines.

The last, very important aspect to be noted is the following: the algorithm created these images, but it didn’t *design* them. The immediate question that arises is, who did? Did humans play a role by crafting the prompts that fueled the algorithm? Or should credit be given to the extensive dataset, the collection of images used to train the algorithm, incorporating the contributions of various creators? Another perspective suggests acknowledging the software engineers who dedicated effort and algorithmic expertise to create these sophisticated algorithms. Alternatively, one might attribute the outcome to the overarching technological “infrastructure” and the engineers who meticulously designed electronic components with the necessary “memory” and “processing power”. Is the algorithm itself deserving of recognition—an entity without sentience, yet capable of transcending material limitations to produce outcomes greater than the sum of its parts?

Regardless of the answers to these inquiries, this assertion posits that we confront an unbreakable interconnection of agents, each serving as an integral element within the whole, resulting in the emergence of a novel creative process. This horizon of unprecedented possibilities demands many considerations in terms of power, ethics and authorship, but its potential to provoke and propel the imagination in unforeseen ways already seems indisputable.

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Back to the Drawing Board: Qualitative and Mixed Research Methods in Architectural Education

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Keywords: Architectural Research, Empirical Evidence, Methodological Definition, Research Methods, Scientific Validity

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In this paper, we emphasize the importance of well-structured architectural research that integrates empirical evidence and clear methodological frameworks. To achieve this, we present the methodological procedures followed in a PhD research project focusing on the role of freehand drawing in architectural design teaching. The thesis employs an embedded multi-case study design, incorporating both qualitative and quantitative data. Three schools were selected as case studies: the University of Porto (Portugal), the Politecnico di Milano (Italy), and the Massachusetts Institute of Technology (US). Data collection methods included naturalistic and participatory observation, individual and group conversations, as well as document and archival consultation. Raw field notes were recorded during design classes at these three schools from 2019 to 2022. These notes were then transcribed into a digital format, supplemented by photographs and documentary records. The collected data were organized in a database and subjected to thematic analysis, utilizing Atlas.ti and Excel. This paper serves two primary objectives. Firstly, it aims to enrich the body of similar studies by providing a comprehensive account of the methodology used in conducting fieldwork. Secondly, it seeks to contribute to the broader discussion on the relevance of architectural research.

1. Introduction

One of the most important criteria for determining the scientific validity and reliability of a research has to do with its methods and how these constitute a methodology (Yin, 1984). It is precisely the explicit and clear enunciation of these methods, whether data collection or analysis, that can guarantee the quality standards of a research and make its results an inter and transdisciplinary value. Moreover, a well-structured and well-described methodology can be an important contribution in itself, serving as a basis for future research in similar settings. If quantitative approaches already have an established place in architectural research, importing from other disciplinary fields such as engineering, the same does not seem to happen with qualitative or mixed methods approaches, in which there is still a long way to go (Li et al., 2021).

In the PhD thesis presented in this paper, we conducted a systematic literature review focusing on the role of freehand drawing in design teaching. By examining research from the last twenty-three years in three prominent databases, we uncovered not only a shortage of studies on this topic but also identified their methodological fragility. Among the papers selected for our analysis, less than half were based on empirical evidence and explicitly outlined their methodology. Some of these papers did not even have a section dedicated to research methods. These numbers shed light on the current status of qualitative and mixed methods research in architectural education, revealing not only a quantitative deficit but also, more significantly, issues related to research quality.

In this paper we seek to examine the significance of a detailed and well-informed methodological framework as a prerequisite for the relevance of architectural research. We

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stress the importance of an evidence-based approach, emphasizing its role in elevating the quality and impact of architectural studies. To this end, we present the methodological framework used in a PhD research within the field of architectural education. We delve into the processes of data collection and analysis, describing and discussing the employed approaches. Through this paper, we aim to contribute directly to future research in similar settings, but also to contribute to the broader discussion on the relevance of architectural research.

2. What Do We Currently Know?

The thesis was structured around three main research questions: (i) how is freehand drawing used in architectural design teaching? (ii) why is freehand drawing still employed in architectural design teaching? (iii) how could freehand drawing be employed in architectural design teaching? To understand how these research questions were addressed in recent years, we conducted a systematic literature review. This involved identifying and analyzing the most pertinent studies on the same subject, which is a critical step to determine the current state of knowledge. It helps us build upon the existing knowledge base and avoid going back to the "drawing board", both in terms of findings and the methods used to generate them.

In a preliminary phase of research, we observed that the topic of architectural education has already been extensively explored, with notable examples such as Milovanovic (2019), Iyer (2015), and Oh et al (2013). However, the same level of investigation does not exist concerning the role of freehand drawing in this learning process.

The systematic literature review serves as a method to ensure the reliability of data collection and analysis, outlining the procedures followed throughout the process (Merzdorf et al., 2021). To guide this review, we followed the methods described by Borrego et al. (2014) and Bramer et al. (2017). Three databases were utilized as sources for our review: two of them were chosen for their multidisciplinary nature—Scopus and Web of Science—while the third was selected for its specialization in education-related studies—ERIC. Our inclusion criteria consisted of peer-reviewed journal and conference papers in English, published after the year 2000.

A primary challenge was the diverse array of subjects in architecture-related publications, spanning through computer science, engineering, social sciences, as well as arts and humanities. This required multiple steps to refine our search strategy and select the most appropriate keywords. Our goal was to collect approximately 150 publications, ensuring a balance between a manageable volume of evidence while also providing a comprehensive perspective on the subject matter.

It's noteworthy that none of the 20 papers we initially selected directly tackled our research questions; however, they provided valuable insights that allowed us to indirectly address them. To make sense of this data, we conducted a thematic analysis of the selected papers and the evidence they presented. This approach enabled us to identify recurring patterns and significant themes among the perspectives we examined.

Considering the first research question, the literature generally indicates that freehand drawing plays a significant role in both the design process and teaching, serving as a valuable tool for thinking and visualization. In response to the second question, it also emphasizes its capacity to stimulate creativity, self-expression, and abstraction. Addressing the third research question, which is inherently more speculative, we gleaned insights into potential future directions for freehand drawing. This includes the reinforcement of both analog and digital aspects, exploring the possibilities of digital hand drawing, and, notably, considering the interests of students.

Another critical aspect we aimed to explore during this literature review was the methodological component, examining how the results presented in the literature were collected and analyzed. Surprisingly, out of the 20 selected papers, only 13 provided empirical evidence, and of those, only 9 describe a clear and detailed account of the methodological procedures employed. This raised an important concern, indicating a gap in research methods. This gap pertained not to the themes being explored but rather the methodological aspects, highlighting a lack of empirical research and comprehensive documentation of research procedures.

When considering research approaches, we found that 6 out of the 13 articles followed a Mixed Methods approach, 5 used a Qualitative approach, and 2 used a Quantitative approach. Moreover, 11 out of the 13 articles were grounded in an experimental research design, with 2 articles employing a case study design. Concerning data collection and analysis methods, experiments and questionnaires were the two most commonly employed.

3. How Was the Methodology Defined?

To enhance and streamline the methodology for a research project, one valuable strategy is to draw from relevant precedents as references. Depending on the specific research goals, these precedents can be combined or adapted to tailor the methodological procedures to the subject and perspective in question.

However, in cases where prior examples are limited or nonexistent, as was the situation in our research—examining educational practices within their specific context—a necessity emerges to establish a methodological framework. This framework, akin to the creation of a theoretical framework, provides guidance for determining the research approach, design, and the specific methods for data collection and analysis, including the establishment of precise criteria. To define this methodological framework, we undertook an extensive review of specialized literature, which led us to conduct a narrative literature review with a focus on qualitative and mixed methods field research within educational contexts.

The first aspect that needed clarification was the selection of the research approach. Based on the criteria presented by Borrego et al. (2009), the selection of the approach depends on (i) the nature of the research questions,

Table 1. Data selection procedures for the literature review.

stages	procedures	count
first	initial number or publications	169
	exclusion by duplication	-22
	exclusion by abstract	-55
	exclusion by lack of access	-56
	number of publications with open access or through institutional agreement	36
second	number of publications classified with maximum relevance	3
	number of publications classified with intermediate relevance	17
	number of publications classified with no relevance, excluded	-16
final	number of publications selected for systematic literature review	20
	number of selected publications that are journal papers	8
	number of selected publications that are conference papers	12

Table 2. Insights from literature for research questions.

research question 1		research question 2		research question 3	
part_design process	18	promotes_creativity	13	design rep_manual-digital	7
tool_thinking	16	allows_expression	9	design rep_d-drawing	6
tool_visualization	13	quality_abstraction	6	design tea_students' interest	3
part_teaching	11	quality_several	5	design rep_hyb-drawings	2
tool_communication	9	supports_memory	5	design tea_drawing inte-tool	2
tool_observation	8	allows_perception	4	design tea_VR	1
when_early stages	8	promotes_exploration	4	new app_design teaching_VR	1
tool_problem-solving	5	quality_bodily factors	4	drawing tea_teamwork	1
tool_annotation	4	quality_transformability	4	new app_design teaching	1

Table 3. Methodology used by the literature.

evidence		approach		design		methods		description	
y	13	mix	6	experimental	11	experiment	11	clear	9
n	7	qual	5	case study	2	questionnaire	9	unclear	4
		quan	2	n	7	artifact analysis	2	n	7
		n	7			n	7		

(ii) the researcher's background and experience, and (iii) the target audience. The last two criteria have limited influence on defining the approach, as the field of architecture itself doesn't inherently prescribe a direction for research. Typically, architectural research draws from the assumptions and strategies of the social sciences, as noted by Creswell (1994, 2014) and Stake (1995). However, it's the specific research problem at hand that ultimately shapes the approach to be taken, as underscored by Yin (1984).

In our case, the nature of the research questions, particularly the second and third ones, which are characterized by their explanatory and exploratory character, and framed as "how" and "why" questions, align with qualitative approaches (Yin, 1984). Consequently, our research will be primarily qualitative, with certain quantitative data as supplementary.

The next step involves defining the research design, which serves as the logical structure of the study, with the primary objective of ensuring that the collected evidence allows for clear answers to the research questions (de Vaus, 2001). In qualitative research, the research design often comprises strategies such as narrative, survey, experimental, archival, historical, ethnographic, or case study (Creswell, 2014).

According to Yin (1984), the selection of the research strategy should take into account three primary conditions: (i) the type of research question or problem, (ii) the extent of control the researcher has over behavioral events, and (iii) the focus on contemporary events within a specific context.

Concerning the first condition, as mentioned earlier, this study revolves around research questions with an explana-

tory and exploratory nature (how and why freehand drawing is used in architectural design teaching). In these cases, research strategies like case studies, experiments, or historical analyses are recommended (Yin, 1984). Regarding the second condition, our aim is to investigate a phenomenon that cannot be subject to behavioral manipulation (architectural design teaching). Therefore, as Yin (1984) suggests, case study and historical research strategies are the most appropriate choices. Lastly, concerning the third condition, the necessity to focus on contemporary events within a specific context (three architecture schools), emphasizes the suitability of a case study strategy.

Case studies are characterized as empirical investigations that examine contemporary phenomena in real-life contexts, particularly when the boundaries between the phenomenon and its context are not evident. In fact, as a research strategy, case studies are frequently used in research within educational settings, as noted by Merriam (1998) and Stake (1995).

Referring again to Yin (1984), the definition of a research project based on a case study should consider three key aspects: (i) the number of cases to be examined, (ii) the selection of units of analysis, and (iii) the establishment of a logical link between the gathered data and the research problem. Regarding the first aspect, this research intends to investigate three educational institutions. Following the framework outlined by Yin (1984), it is common for each institution-school to be treated as an independent case. Therefore, in contrast to single-case studies, this research will adopt a multiple case study design.

Concerning the second aspect, the research's objective is to focus on a specific phenomenon, namely, the teaching of architectural design, within each case institution. The aim is not to analyze the cases as a whole, from a holistic perspective, but to focus on a study subject composed of a set of embedded units of analysis. As a result, the research will employ a multiple case study design, encompassing three units of analysis: the context, the design process, and design critiques. Regarding the third aspect, the aim is to establish a connection between the collected data and the research problem using a logical deductive-inductive method, beginning with an overarching picture (general) before delving into the specific study object (particular).

4. How Was Data Collected?

Data collection in all three case studies primarily involved fieldwork sessions where naturalistic and participatory observation methods were used. The choice between these methods depended on the specific case and the availability of instructors. Typically, the researcher aimed to minimize interference with the normal flow of classes, adopting a non-intrusive approach. Nonetheless, there were occasions when instructors invited the researcher to become actively involved in the classes, providing feedback on students' work, serving as a jury during final presentations, and even participating as a teaching assistant for short periods.

The data collection process primarily consisted of taking raw fieldnotes during class observations (Figure 1). Additionally, curricular documents and reports were collected to gain insights into course objectives, schedules, and some specific papers. The collected fieldnotes were later transcribed into a digital format referred to as Didactic Registration Units (Figure 2). This transcription process served as a preliminary stage for selecting and summarizing the collected materials. It also helped evaluating the effectiveness of data collection procedures, which, in turn, informed future data collection sessions.

Whenever possible, photographic records were taken, serving a dual purpose: documenting the teaching environment and capturing unique aspects of materials produced by students and instructors. Although photographic records had limited relevance during data analysis, they were important in visually communicating the research findings.

The primary emphasis during fieldwork was on the design studios. The objective was to observe students from various academic years to gain insights into their backgrounds and education, instructor expectations, and curriculum in the three schools. The types of classes observed included design critiques, pin-up sessions, mid-term reviews, final presentations, and theoretical classes. In addition to in-person fieldwork, remote classes were also attended, particularly during the second wave of the Covid-19 pandemic between November and March 2021.

As observed during data collection, systematic direct observation helps mitigate the initial awkwardness of the researcher's presence for both instructors and students. In the initial observed classes, the researcher's presence often influenced subject behavior due to the novelty of the situation. Systematic observation also allows for the identification of exceptional situations that may occur during classes. For instance, it was noted in all three schools that instructors tended to showcase the best student works as exemplary cases, which could potentially introduce bias into the research findings. Extensive class observations, covering different teaching moments, are therefore relevant for a comprehensive understanding of events and behaviors.

Furthermore, this approach enabled the contributions of research subjects themselves, namely instructors and students. Spontaneous conversations that occur during fieldwork are invaluable, serving as a form of open interviews, as highlighted by Yin (1984). These conversations offer direct input, including literature recommendations, while also providing opportunities to get feedback on research results, interpretations, and methodological procedures being employed.

5. How Was Data Analyzed?

According to Merriam (2009), data analysis and interpretation represent the complex process of extracting meaning from collected data through consolidation, reduction, and examination procedures. In our study, we employed thematic analysis, a common approach in qualitative research, to analyze texts derived from field notes and interviews, applying codes and developing themes (Hatch, 2002). During our research, data analysis proved to be a complex and time-consuming activity, primarily due to the absence of

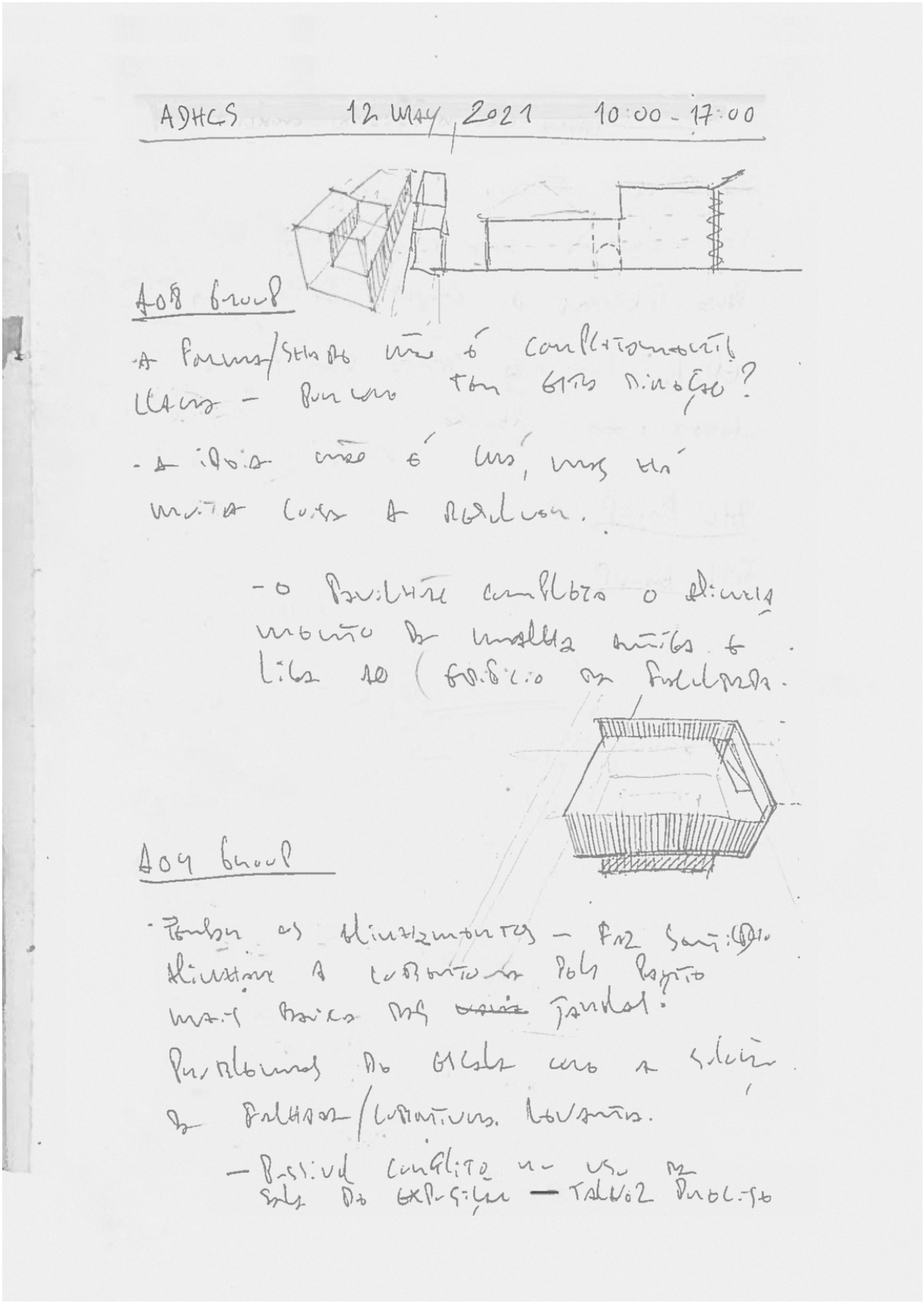
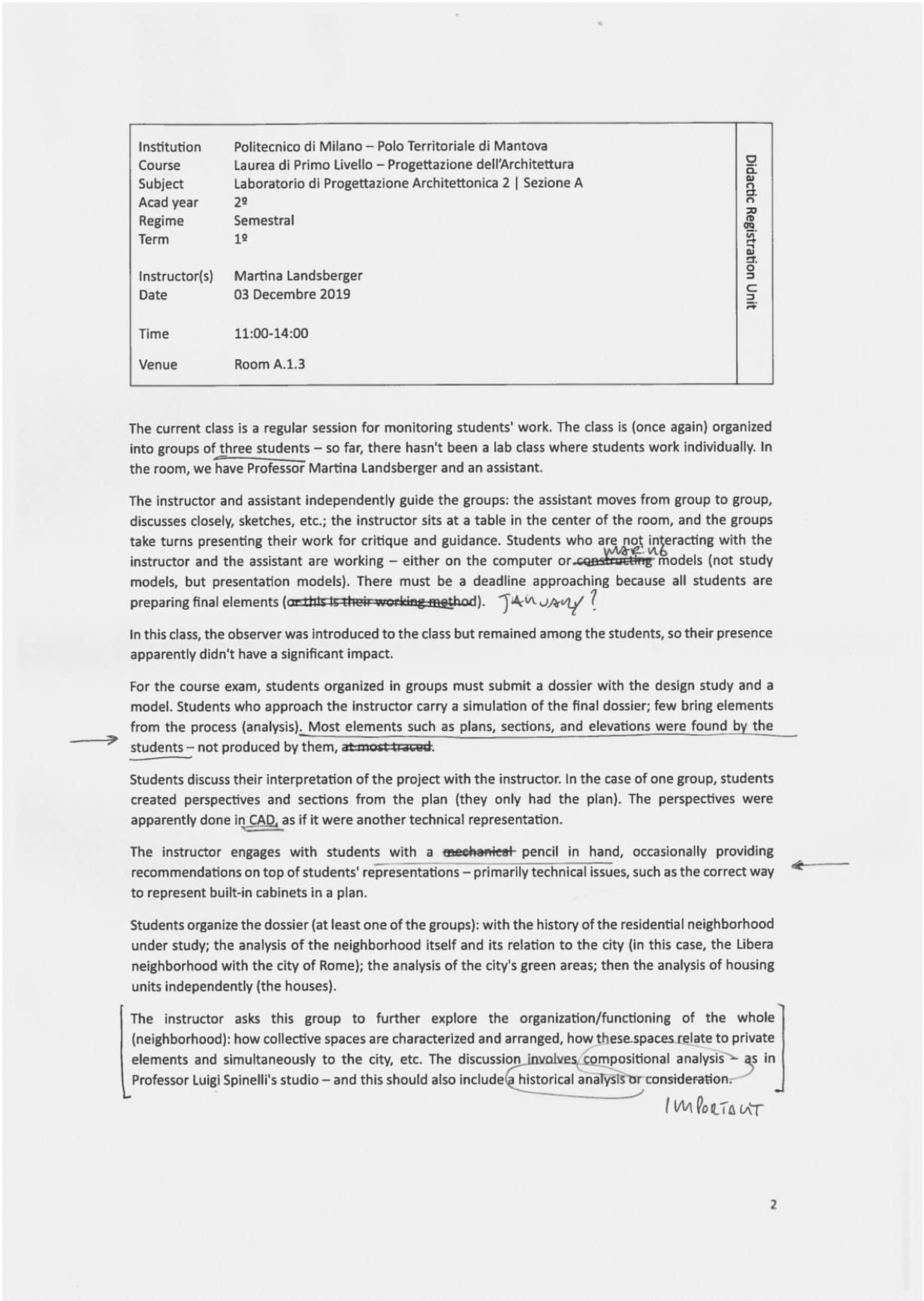


Figure 1. Notebook used in fieldwork sessions, Mantua, 2021



Institution	Politecnico di Milano – Polo Territoriale di Mantova
Course	Laurea di Primo Livello – Progettazione dell'Architettura
Subject	Laboratorio di Progettazione Architettonica 2 | Sezione A
Acad year	2º
Regime	Semestral
Term	1º
Instructor(s)	Martina Landsberger
Date	03 Decembre 2019
Time	11:00-14:00
Venue	Room A.1.3

Didactic Registration Unit

The current class is a regular session for monitoring students' work. The class is (once again) organized into groups of three students – so far, there hasn't been a lab class where students work individually. In the room, we have Professor Martina Landsberger and an assistant.

The instructor and assistant independently guide the groups: the assistant moves from group to group, discusses closely, sketches, etc.; the instructor sits at a table in the center of the room, and the groups take turns presenting their work for critique and guidance. Students who are not interacting with the instructor and the assistant are working – either on the computer or ~~constructing~~ models (not study models, but presentation models). There must be a deadline approaching because all students are preparing final elements (~~or this is their working method~~). January ?

In this class, the observer was introduced to the class but remained among the students, so their presence apparently didn't have a significant impact.

For the course exam, students organized in groups must submit a dossier with the design study and a model. Students who approach the instructor carry a simulation of the final dossier; few bring elements from the process (analysis). Most elements such as plans, sections, and elevations were found by the students – not produced by them, ~~at most traced~~.

Students discuss their interpretation of the project with the instructor. In the case of one group, students created perspectives and sections from the plan (they only had the plan). The perspectives were apparently done in CAD, as if it were another technical representation.

The instructor engages with students with a ~~mechanical~~ pencil in hand, occasionally providing recommendations on top of students' representations – primarily technical issues, such as the correct way to represent built-in cabinets in a plan.

Students organize the dossier (at least one of the groups): with the history of the residential neighborhood under study; the analysis of the neighborhood itself and its relation to the city (in this case, the Libera neighborhood with the city of Rome); the analysis of the city's green areas; then the analysis of housing units independently (the houses).

The instructor asks this group to further explore the organization/functioning of the whole (neighborhood): how collective spaces are characterized and arranged, how these spaces relate to private elements and simultaneously to the city, etc. The discussion involves compositional analysis – as in Professor Luigi Spinelli's studio – and this should also include a historical analysis or consideration.

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Figure 2. Example of a Didactic Registration Unit (DRU), Porto, 2022

Figure 3. Design studio at the Politecnico di Milano, Mantua, 2020.

prior references. We had to undergo numerous trial-and-error tests to devise effective data management and manipulation strategies. This process spanned the entire duration of our study.

Throughout this thesis, alongside the core analysis, a series of side studies, referred to as Complementary Readings, were conducted. These studies had a dual purpose. On one hand, they aimed to delve into aspects that were not addressed in the primary analysis, such as how freehand drawing is taught outside of design studios (Sousa Santos et al., 2021b), or the implications of online teaching in design teaching during the pandemic (Sousa Santos et al., 2021a). Simultaneously, these Complementary Readings served to test data analysis methods, which, in turn, informed our main investigation.

We presented the findings from these partial studies at conferences to gather feedback from our peers. This process shed light on both strengths and weaknesses, providing valuable insights for the core analysis. These conferences also exposed us to other ongoing research that, while not directly related, offered relevant methodological new possibilities. For instance, our initial attempts at data analysis did not include specialized software, resulting in a time-consuming and intricate process due to the diversity and volume of data. It was during a conference that the use of Atlas.ti, complemented with Excel, was recommended to streamline the analysis procedures, and ensure the rigor and validity of our results (Figure 4-5).

6. What Lessons Were Learned?

In the work we presented, we can distinguish the lessons learned regarding the methodological framework and the systematic collection of empirical evidence. First, in terms of methodology, qualitative and mixed-method research possess a dynamic and interactive nature. It involves a comprehensive, adaptable, and evolving approach to the very study procedures. While it's advantageous to begin with a well-thought-out plan, the flexibility to adapt to specific research circumstances is crucial, especially in the context of fieldwork with real-world intricacies. As referred by Hatch (2002), qualitative approaches are characterized by the openness, flexibility, and emergence of its procedures in response to the realities of the environment under study.

In our case, the final version of our research questions only took shape in the advanced stages of our work. Similarly, many initial methodological decisions underwent changes throughout our research journey. Nevertheless, the initial study and work plan were fundamental as they guided our research and provided a foundation for the subsequent adaptations. As Hatch (2002) argues, in a qualita-

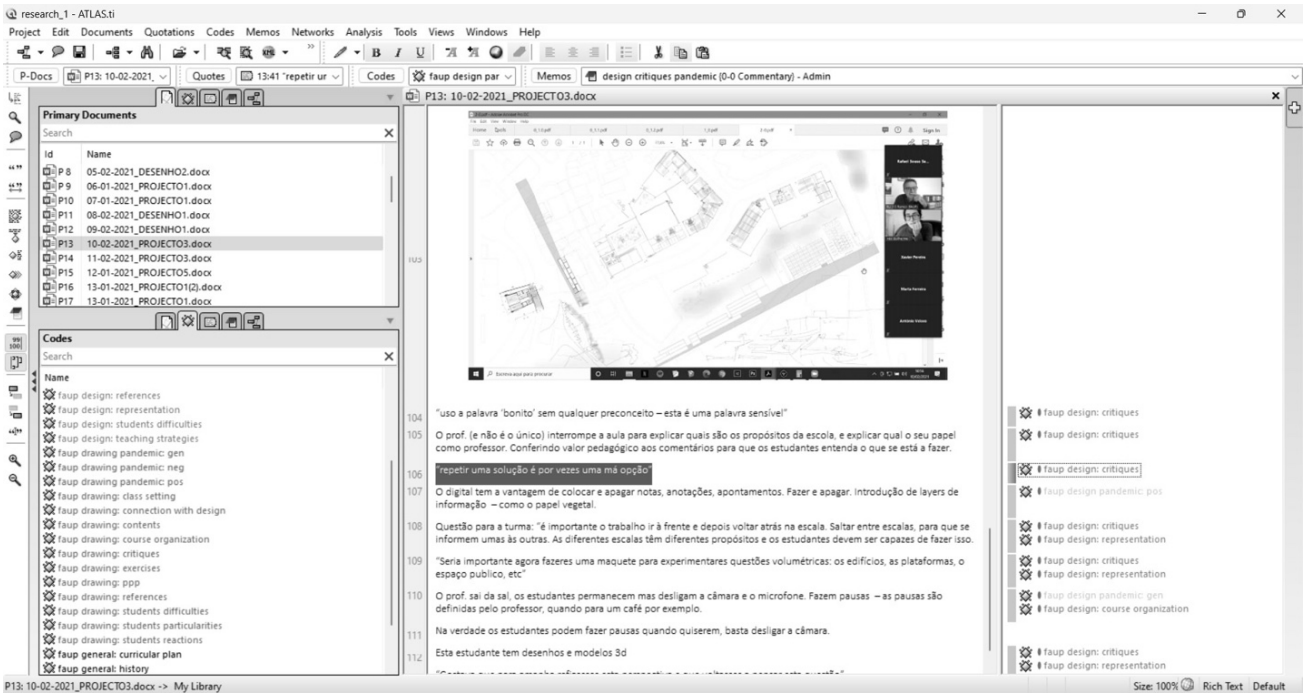

Figure 4. Screenshot of a DRU being analyzed with Atlas.ti, 2022.

tive or mixed-method study, the researcher is not putting together the pieces of a puzzle of which he/she already know the figure, but building a figure that takes shape as the pieces are collected and examined.

In the second aspect, the empirical component takes center stage. This means acquiring knowledge through direct experience within the real-world context under investigation. This is particularly vital for studies like ours, aiming to understand a phenomenon within its natural setting. Furthermore, the systematic collection and analysis of data over an extended period are critical for minimizing interpretation biases, given the central role that the researcher plays in qualitative studies.

Furthermore, considering the existing body of literature, our research has shed light on nuanced aspects that were not previously identified during our literature review. Additionally, our findings challenge some conventional beliefs within literature. For example, it was found that freehand drawing is not only prevalent in all three schools under study but it's also a valuable design tool for students, even those without formal training in hand drawing. Surprisingly, freehand drawing plays a pivotal role in design critiques at all three schools, with instructors primarily using it as their mode of interaction with students, without a comparable alternative. We see thus that despite the generalization of the use of digital media in architecture (Abondano Franco, 2015), in an educational context, freehand drawing continues to be used and to have a certain prominence.

Our data also revealed that freehand drawing is present throughout all phases of students' architectural design, from initial concepts to advanced detailing. This challenges the prevailing notion in the literature that associates freehand drawing primarily with the early phases of design.

Furthermore, the common distinction between analog and digital, particularly concerning conventional freehand drawing and digital methods, does not hold up. Our research shows that these approaches are closely interconnected. During the pandemic, for example, we observed how instructors and students seamlessly transitioned to using digital devices for freehand drawing (Sousa Santos et al., 2021a). In the case of MIT, students employed digital tools for taking notes and creating drawings, mimicking a traditional notebook format. This transition does not fundamentally alter the freehand drawing technique, highlighting the integration of analog and digital methods.

7. Conclusions

With this paper, we present two key arguments. Firstly, we stress the importance of architectural research being firmly rooted in a well-defined and informed methodological framework. This means that researchers need to carefully study and establish a structured approach to their work, akin to how they would create a theoretical framework. By doing so, they can ensure that their research is based on stable methodological assumptions, which, in turn, guarantees its quality and reliability. Simultaneously, this approach allows them to make meaningful contributions to the broader knowledge base in their field.

We illustrate this point with the example of a PhD research project that explores the role of freehand drawing in teaching architectural design. The absence of relevant prior work in this area prompted us to go back to the "drawing board" to develop our methodological framework.

The second argument we make is the importance of anchoring this type of research in empirical evidence. This evidence should be systematically collected and analyzed, in contrast to studies that rely on anecdotal accounts, as high-

id			ua_context								
			setting					brief			
id	date	year	inst_num	assistants_num	guests_num	guests_role	brief	brief_program	brief_detailed	brief_nature	brief_context
1	04/abr	2022	1	1	3	lecturer	y	practical-design research	n	both	n
2	06/abr	2022	1	n	n		y	a robotic prototype	n	sy	n
3	06/mai	2022	2	1	3	reviewer	y	equipment (fragile territory)	n	both	real
4	07/abr	2022	1	1	n		y	equipment (historical building)	n	both	real and visitable
5	07/abr	2022	2	n	n		y	equipment (fragile territory)	n	both	real
6	08/abr	2022	1	1	1	lecturer	y	equipment (historical building)	n	both	real and visitable
7	08/abr	2022	2	n	n		y	equipment (fragile territory)	n	both	real
8	09/mai	2022	1	1	3	reviewer	y	equipment (historical building)	n	both	real and visitable
9	11/abr	2022	2	1	n		y	practical-design research	n	both	n
10	11/abr	2022	1	2	n		y	lamp, furniture	n	sy	n
11	13/abr	2022	1	n	n		y	a robotic prototype	n	sy	n
12	15/mar	2022	1	1	3	reviewer	y	free (thematic)	n	both	real and near
13	16/mar	2022	1	1	3	reviewer	y	an object (sculpture or furniture)	n	sy	n
14	16/mar	2022	1	2	n		y	lamp, furniture	n	sy	n
15	16/mai	2022	1	1	4	reviewer	y	free (thematic)	n	both	real and near
16	25/abr	2022	1	1			y	an exposition	n	sy	real and near
17	28/mar	2022	1	2	n		y	series of design object	n	sy	n
18	28/abr	2022	1	1	1	lecturer	y	equipment (historical building)	n	both	real and visitable
19	30/mar	2022	1	2	3	lecturer, reviewer	y	series of design object	n	sy	n
20	31/mar	2022	1	2	n		y	analysing and modulate Alvar Aalto	n	an	n

Figure 5. Segment of the Excel synthesis table showing the first unit of analysis, Porto, 2022

lighted in our literature review. This approach ensures that the collected data is tied to a specific context, and instead of being generalized, it can serve for transferability (Yin, 2011). Additionally, by following systematic procedures, it minimizes potential bias. This is an important consideration, especially in qualitative approaches where the interpretative component carries significant weight, and therefore, ensuring its reliability is crucial.

As we discuss in our lessons learned section, the evidence we gathered enabled us to draw conclusions that had not yet been adequately addressed in the existing literature, and in some cases, it challenges prevailing views.

Reflecting on the current research in architecture, Sofie Pelsmakers emphasized in an interview that its relevance hinges on delving deep into issues rather than skimming the surface, and on upholding high standards of quality (in

Figure 6. Design critique at MIT, Cambrigde, 2022.

Sousa Santos, 2023). This emphasis is rooted in the understanding that research must meet rigorous standards to be fruitful; otherwise, it becomes an exercise in futility, offering no meaningful contribution to the field of architecture.

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Rhythm Matters! How Rhythm Analysis Bridges Architecture and Sociology

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[1] Designing Urban Experience, University of Amsterdam

Keywords: Rhythm, social context, urban dynamics, temporality, emergence

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By bringing the social dynamics in cities to the surface, rhythm analysis offers novel insights into the spatio-temporal notions that characterise urban life and experiences. The research presented in this contribution proposes a rhythm analysis framework for bridging architecture and social sciences to facilitate design interventions that are fine-tuned to the social context in cities. The results identify three aspects of city rhythms: (1) rhythms in the outdoor spaces and around the buildings, conceptualised as "rhythm zones", (2) rhythms in the care services offered by societal organisations that are hosted in public and semi-public buildings, conceptualised as "rhythm-scapes" and (3) rhythms of ordinary activities that shape the urban social life and interactions, conceptualised as "rhythm spheres". Each aspect includes different methods for analysing and documenting rhythms, enabling novel possibilities for spatial practices. Focusing on the dynamic quality of physical urban spaces, relations between actors and institutions and interactions between communities creates a bridge between academic research and spatial practice at a level of analysis of the urban social life that is straightforward, replicable and inventive.

1. Introduction

The past two decades have marked the social turn in architecture. Architects became more concerned with their designs approaching complex urban issues such as affordable housing, climate adaptation, energy efficiency and social justice. Such a social turn differs from the emergence of discussions on social space. While the latter addresses a physical space where social interactions between people flourish, the first is interested in issues on broader scales and across disciplines through dialogue, long-term research and collaboration. The social turn in architecture is also marked by the introduction of time and temporality in exploring new vocabularies and methods for interventions in (urban) spaces (Sartorio & Airoldi, 2023). The underlying goal in considering the relationship between time and space is to increase the experiential knowledge in architecture (Plowright, 2022), arriving at the objective of better understanding and articulating the social context.

But what is the social context? Does it have specific components that we can identify and work with? What concepts and methodologies can be used to approach it meaningfully?

Within these discourses, urban studies experience a turn of addressing the questions and issues from the bottom up by bringing to the surface the multiplicity of experiences, voices and visions that constitute the urban domain. Comparing this to the previous debates in geography, highlighted as the "spatial turn", characterised by a curiosity about the urban space as not only geometrically planned but also produced, lived and conceived (Graham & Healey, 1999), we see a new need to connect the analysis to practice. It becomes increasingly clear that architects, urbanists and social scientists must speak common languages and engage with shared methods. Nevertheless, there is a scarce overlap between the emerging and novel concerns in the two spatial disciplines. While architecture rarely consults the methods in sociology, urban studies disregard the value of architectural design knowledge and vision.

This paper aims to answer this research gap by exploring new definitions of urban life and experiences based on making a bridge between its physical and social realities

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through rhythm analysis. Not by giving a prevalence to one but by approaching the physical and the social within the often-disregarded point where they meet, that of rhythm. Architectural design can be seen as a rhythm intervention: a bench placement at a park, a façade construction of an existing structure, or a new building alternates the current rhythms in the built environment. At the same time, people's activities generate temporal patterns and rhythms in the physical environment, and many social questions in the city can be improved through spatial and temporal design (Nevejan & Sefkatli, 2020). In 21st-century urbanisation, rhythm can shed light on dealing with complex issues, notions and experiences that create the urban. Understanding the value of urban rhythms in a social problem can improve the methodologies for working with rhythm and expand the usage of the concept.

2. Developing a New Approach to Design through Rhythm Analysis

Cities play their rhythms for us, and often, we are not confronted with methodologies to hear them or use their outcome productively. From the times of Plato and Aristotle until today, many philosophers have contributed to creating a definition of rhythm (Michon, 2016). The word rhythm is a part of our culture and language. Defined by "variation in repetition in a given context" by the Dutch philosopher Marli Huijer (Huijer, 2015), it is a distinct dynamic quality that creates a force of engagement between people and establishes continuity of experiences in daily life (Dewey, 2005). Although rhythm can be used as a concept and mode of engagement for contemporary, interdisciplinary understandings of the urban (Smith & Hetherington, 2013), its potential as a methodology for better understanding the social aspect of urban life and for identifying design spaces is hardly explored (Nevejan & Sefkatli, 2020).

The theory of rhythms has been in the discourse of urban studies since the 1970s, with Henri Lefebvre's reflections on the city as a "multiplicity of rhythms" (Lefebvre, 2010). Together with Lefebvre, the contributions of philosophers Gilles Deleuze and Felix Guattari initiated the exploration of daily life and social phenomena as emergent features of social and spatial rhythms of different forms and cycles (Deleuze & Guattari, 1987). The city has been a primary context in the work of these philosophers as an environment where polyrhythmicities are manifested and acted out, also opening up a new possibility for spatial practices to align with the urban dynamics.

Developing methods for bridging spatial practices with social sciences through the lens of rhythms and urban dynamics is a novel ambition. Such an understanding is especially relevant in today's increasingly complex cities, which require more transdisciplinary and inclusive architectural and urban design knowledge (Després et al., 2011). Different parties, from designers, scientists, policymakers, community initiatives and citizens, must work to address various challenges in the cities' spatial, social and organisational layers (Ese & Ese, 2022). Bottom-up and participatory approaches are already being incorporated into the education and practice of architecture in multiple design stages, allowing architects to adopt different expertise and forms of knowledge (Shanthi Priya et al., 2020). However, how urban practitioners understand the city should also be expanded towards seeing it as a dynamic entity shaped and characterised by various activities, happenings, events, and advents that take place at different temporal cycles and places (Durose et al., 2022). Conceptualising how rhythms clash, merge and harmonise creates a new vocabulary for addressing the social context, which is crucial for developing novel avenues in architectural design interventions and giving a unique perspective to the social phenomena in cities.

The presented experience in rhythm analysis explored this urgency by addressing the urban social phenomena as emergent features of city rhythms. This meant understanding the diversity of dynamics that engage and interconnect with each other in space and time in neighbourhoods, districts and cities. Through conducting case studies in the Zuidoost city borough of Amsterdam, we aimed to expand the understanding of the urban social context to create a novel perspective on social issues in the urban environment. As a result of these explorations, we propose that drawing such an approach to the urban social context is also the key to integrating architecture and sociology; by identifying and visualising the various rhythms that constitute urban social life, it becomes easier for both disciplines to collaborate and come up with shared solutions. While architecture interventions can be fine-tuned with the social context, sociology can result in impactful conclusions for spatial practice.

3. Developing Rhythmic Concepts, Theories and Methods

The social questions explored in Amsterdam Zuidoost through case studies resulted in the development of three concepts: (1) rhythm zones, spatio-temporal patterns in outdoor spaces that engage social, spatial, trash and maintenance rhythms, which are characterised by their internal dynamics as well as by other zones that surround them; (2) rhythm-scapes, groupings of rhythmic elements in time, place, action and relation dimensions, which shape the experiences and presence dynamics of services offered by urban functions and societal organisations; and (3) rhythm spheres, spatio-temporal categorisations of everyday urban activity rhythms based on proximity and distance, that articulate the rhythms of intimate relationships, community and public life.

Analysing rhythms through the case study approach was a nonlinear process. Within the Designing Rhythms for Social Resilience research, which was the framework in which concepts of rhythms and methods for capturing them were developed, the starting point was the social issue. First, the urban context where the social problem occurred was studied, and theory explorations on rhythms were carried out. Based on the developed theoretical framework, methodologies were selected to identify and document rhythms. Next, the urban context was revisited, and rhythm analysis was carried out. The results of the rhythm analysis helped de-

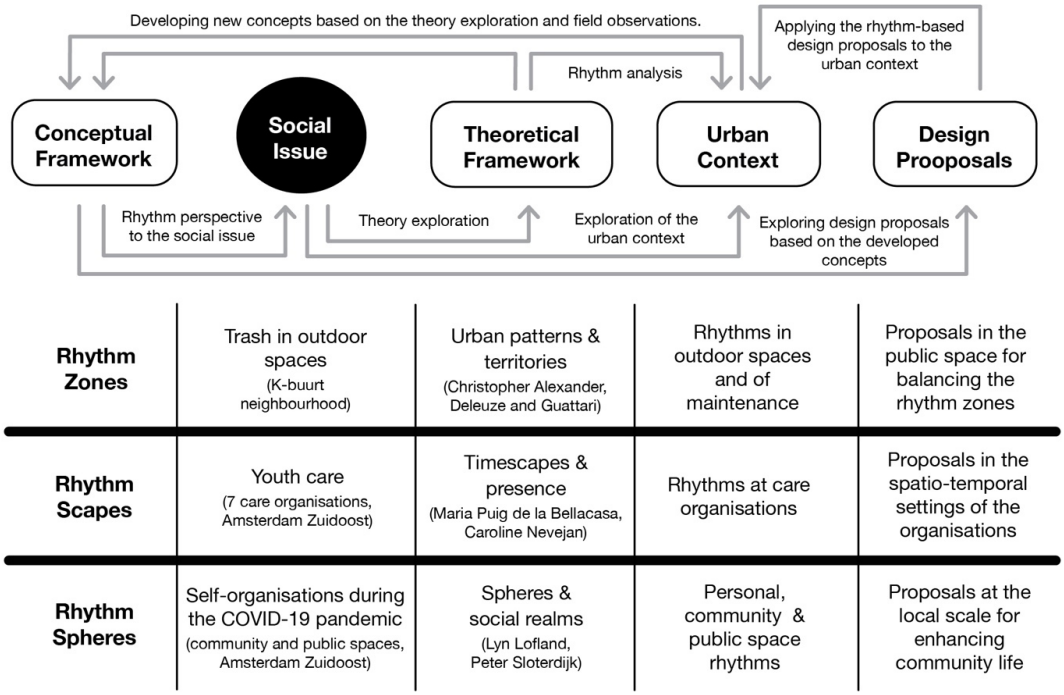

Figure 1. Research flow for conducting the case studies and retrieving design conclusions.

velop concepts for understanding the social problems being investigated from the perspective of rhythms. Such concepts were influential in stimulating new vocabularies to define urban social phenomena for social sciences, while for architecture, they enabled alternative design solutions.

The social issues studied in Amsterdam Zuidoost were decided upon in collaboration with the local municipality. The rhythm zones concept was developed in the context of trash in outdoor spaces around two housing blocks, rhythm scapes in the context of youth unemployment and the precarity of youth care organisations, and rhythm spheres while exploring the community-based self-organisations during the COVID-19 pandemic. While the first case study was conducted specifically in the K-buurt neighbourhood, the other two case studies took place in various urban contexts of Amsterdam Zuidoost.

The methodologies for identifying the rhythms differed for each concept and offered a combination of spatio-temporal analysis and ethnographic work. Rhythm zones were identified based on spatial observations, systematic documentation of the activities in outdoor settings, functional analysis and mapping of the spatio-temporal patterns. To sharpen the findings, participatory observations and "trash walks" were carried out with the neighbourhood cleaners and residents. The rhythm-scapes are identified through participatory observations at care organisations, documenting the spatial and temporal components that characterise their practice and interviews with the care workers and young people at these places. The methods used to identify rhythm spheres are community workshops and interviews for documenting the daily, weekly and yearly rhythms and mapping where they occur. To fine-tune the findings with the insights gained from the interviews, ethnographic work was carried out at the care organisations while conducting the interviews.

While the fieldwork in the previous case studies took around six months, the final case study on the pandemic lasted about one and a half years. In all case studies, the results were presented to the local city council of Amsterdam Zuidoost and the leading partner organisation from the Municipality of Amsterdam, namely the cleaning department in the first, the social work department in the second and the health department in the third. After each case study, design proposals were made to the local municipality of Amsterdam Zuidoost, offering alternative solutions to the social issues.

4. Rhythm Zones

Outdoor spaces are areas where many rhythms, ranging from mobility patterns to seasons, social gatherings, and urban functions, merge and interact. Design interventions affect these rhythms at various scales. For example, a new playground in an unused green area may attract a lot of activity, influencing the rest of the neighbourhood's daily rhythms. Therefore, methodologies for spatial practices must address such a diversity of spatio-temporal organisations and the everyday life experiences that emerge from them. The rhythm zones concept suggests that the coming together of various rhythms in outdoor spaces is experienced in zones which can be identified and mapped. Following Christopher Alexander's pattern language (Alexander et al., 1977), they are conceptualised as the "emergent relationships" of the correspondence of multiple patterns in space and time.

The case study on trash in outdoor spaces, which led to the development of rhythm zones, concerned the contrast-

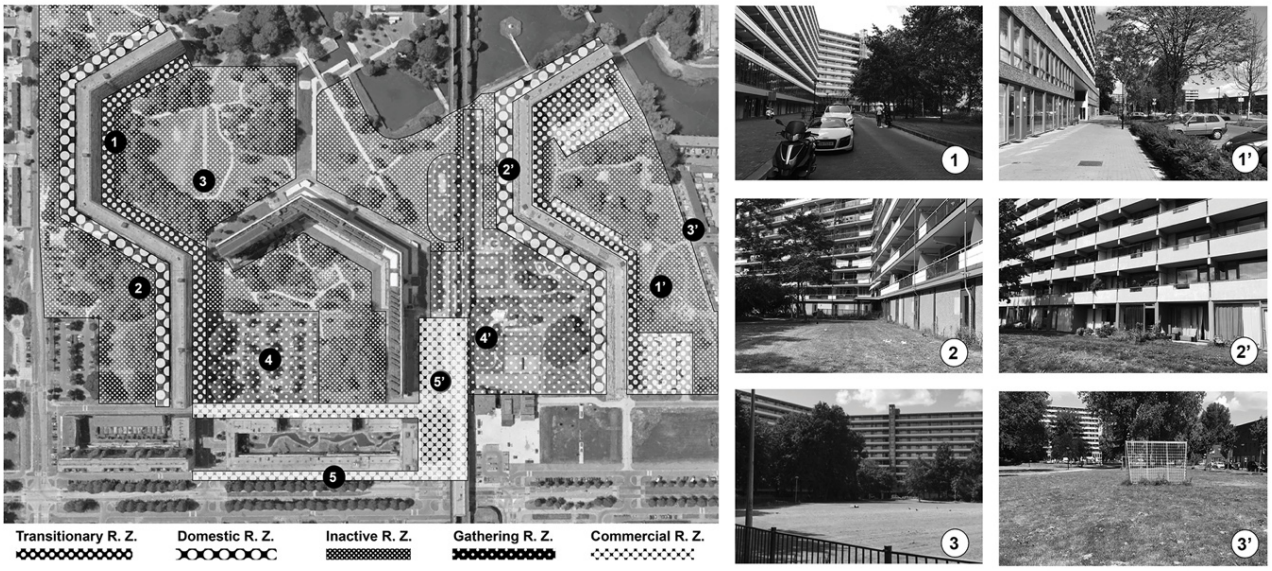

Figure 2. Visualisation of the rhythm zone concept.

ing trash behaviours around two housing blocks in Amsterdam Zuidoost's K-buurt neighbourhood, Kikkenstein and Kleiburg. The rhythm analysis focused on identifying social rhythms referring to daily activities like going to work or shopping, spatial rhythms such as green spaces, sidewalks, car parks and sports fields, and rhythms of urban maintenance like the type of trash cans or frequency of cleaning. Multiple maps were produced to represent the findings visually, making it possible to recognise these patterns singularly and analyse their relationships. It was found that the residential sidewalks allowed for the translocation of the residents, while those in central locations hosted the shopping activity. The surroundings of the buildings displayed activities reserved for households. The sports fields and playgrounds created social activities, while no dominant activities were observed in the large green spaces. These spatio-temporal relationships also exist in the cleaning practice. The spatial characteristics define how urban places are cleaned; machines clean sidewalks, while grass is cleaned manually. On the other hand, social use in the urban environment represents how frequently an area is cleaned and what type of trash collection it can host.

We conceptualised the phenomenon that emerges as the different spatial, social and cleaning patterns come together as "rhythm zones" (Sefkatli & Nevejan, 2023). Five rhythm zones were identified: domestic, transitional, inactive, gathering and commercial rhythm zones. Referring to Alexander (Alexander et al., 1977), besides having their internal dynamics, the rhythm zones are also characterised by the other rhythm zones that they correspond to. Their rhythmic dynamics also meet when two or more rhythm zones meet in the environment.

The latter is the aspect of the rhythm zones that leads to trash. In the context of the research in the K-buurt, it was suggested that the correspondence of the transitionary and gathering rhythm zones resulted in a clash of many social activities and, consequently, in large amounts of trash. On the contrary, the intersection of the domestic and inactive rhythm zones resulted in too little activity and much trash. In comparison, the correspondence of domestic and gathering, or transitionary and inactive rhythm zones, appeared to create a balance in social activity, resulting in cleaner outdoor spaces. Therefore, it was found that not only the internal dynamics but also how the external relationship of these dynamics influences the emergence of trash in the outdoor spaces.

5. Rhythm-Scapes

Care services form an essential network in the urban environment. From community centres to places directed to a specific cultural group or religious organisations, care services shape the urban fabric as the meeting points of communities and places to go for those needing assistance. In the youth care context, these services offer various rhythms to engage with the youth. Many factors influence the type of care provided in the urban context, such as the location of the organisations that offer care services, spatial disposition, opening hours and people who are present. Nevertheless, these services are often disregarded in the discussions regarding the urban social context. This is also reflected in policymaking, whereas not recognising the spatio-temporal quality of the care services leads to their precarity.

To better understand the rhythmic experiences of youth care services, we followed Maria Puig de la Bellacasa's operationalisation of Barbara Adam's timescapes concept (Adam, 2005; Puig De La Bellacasa, 2011). While Adam highlights the multiplicity of rhythms involved in care in socio-technical systems and how they influence the orchestration of the present (Adam, 2005), Puig de la Bellacasa explores this in the context of soil, identifying three ways of care: practical, epochal and embodied (Puig De La Bellacasa, 2015). To employ the timescapes concept for identifying the various spatio-temporal qualities of youth care, we used Caroline Nevejan's YUTPA framework, which focuses

on the dynamics of presence (Nevejan & Brazier, 2010). According to Nevejan, presence can be analysed in the dimensions of time, place, action and relation. The framework guided us to document the rhythms of the care organisations in these four dimensions, suggesting that timescapes allow for different ways of being present through the rhythms they generate. In this light, we conceptualised rhythm-scapes to create a new vocabulary for the social interplay the care organisations enable. Examples of rhythms in these dimensions were "weekly activities", "waiting rooms", "informal exchanges", and "volunteers".

Like rhythm zones, the rhythm-scapes concept suggests that such rhythms form groupings in the analysed locations. For example, the practices that allowed for informal exchanges, like picking up food, also required interactions in unplanned, in-between spaces. The services that included specific time schedules also provided rigid spaces and definitions of roles within the practice. Moreover, the care services that included many events and creative activities were equipped with flexible spaces and time schedules. Three rhythm-scapes were identified: the rhythm-scape of activity-based care, the rhythm-scape of administrative care and the rhythm-scape of social care.

The ethnographic work at the organisations that offer care services showed that they incorporate multiple rhythm-scapes in their practice. In this light, we identified three types of organisations. The first type is where the rhythm-scape of administrative and social care are predominant; the second type is where the rhythm-scape of activity-based and social care prevail in the care practice; and the third is where the rhythm-scape of administrative and activity-based care is prioritised. By engaging with two or three rhythm-scapes simultaneously, they offer various spatial settings and temporalities to be as meaningful as possible for the urban environment where they are located or the community they focus on. How the rhythm-scapes are combined within the organisations' practice also shapes the care experiences.

6. Rhythm Spheres

The social context of cities deals with everyday urban activities at many scales, directly or indirectly. These activities offer different rhythms in space and time through which community life emerges in the urban context. The COVID-19 pandemic heavily disrupted these rhythms by imposing spatiotemporal restrictions on activities, functions and networks that constitute urban social life. In Amsterdam Zuidoost, while the community rhythms underwent many disruptions and changes, new rhythms emerged amongst the communities thanks to the self-organisations orchestrated in the neighbourhoods.

We approached this phenomenon by articulating how urban community life emerges from everyday ordinary activities. Deploying Lyn Lofland's social realms (Lofland, 1998) and Peter Sloterdijk's notion of spheres (Sloterdijk, 2011, 2014, 2016), we conceptualised rhythm spheres. While Lofland's social realms suggest that urban social life and interactions can be observed at the level of private, community and public realms, Sloterdijk distinguishes these three levels from the perspective of proximity and distance in space and time. Following this outlook, the rhythm spheres concept identifies spatial proximity, temporal frequency and the length of synchronous engagement as parameters that shape the social aspect of ordinary urban activities. Three types of spatio-temporal categorisations are distinguished: (1) rhythm spheres of bubbles, referring to activities that occur through high spatial proximity, temporal frequency and the length of synchronous engagement; (2) rhythm spheres of foams, referring to activities with average spatio-temporal intensities, such as a temporal frequency of few times a week or synchronous engagement of 2 to 6 hours, and (3) rhythm spheres of globes, referring to activities with low temporal frequency, like conducting an activity monthly, high spatial proximity, like travelling to another district or region, or with low synchronous engagement, like up to one hour.

Eight ordinary urban activities were considered in the analysis: household, family and friends, work, school, culture-related, interest-based, local exchanges and recreational activities. The qualitative data showed that each activity incorporates different spatiotemporal proximities and synchronous engagement possibilities. By visualising the spatio-temporal quality of these activities, it was possible to see how the urban rhythms changed during the pandemic. Based on this articulation, the changes in urban life during the pandemic were represented in the shift of spheres.

The main changes observed in the case study were the transition of the everyday activities from the foam and globe spheres to that of the bubble and the shrinking of the foam sphere. Different community-based self-organisations occurred in Amsterdam Zuidoost to mitigate the changes in the rhythm spheres. The observations brought to the surface that these orchestrations also took place within the foam sphere based on the proximity, frequency and synchronised engagement they allowed for. As a result, it was shown that the foam sphere is an influential aspect of urban life to consider for pandemic preparedness.

7. Towards Rhythm Analytical Research and Design Framework

This paper proposed three concepts of rhythm analysis to bridge architecture and sociology by better articulating the social context of cities and propose shared solutions that are fine-tuned to the experiences of urban residents. The rhythms addressed through the case studies extend beyond daily routines; they encompass the socio-cultural, economic, and environmental cycles. Considering that the urban environment is in continuous flux and change orchestrated by physical arrangements and temporal synchronisations introduces a new approach to spatial design and social sciences. With the identified rhythms and the rhythm-based description of the social phenomenon, it becomes possible to propose shared design solutions for both disciplines.

The rhythm zones are identified through social and spatial patterns observed in outdoor spaces. They can be spatially mapped, and their relationships can be analysed in

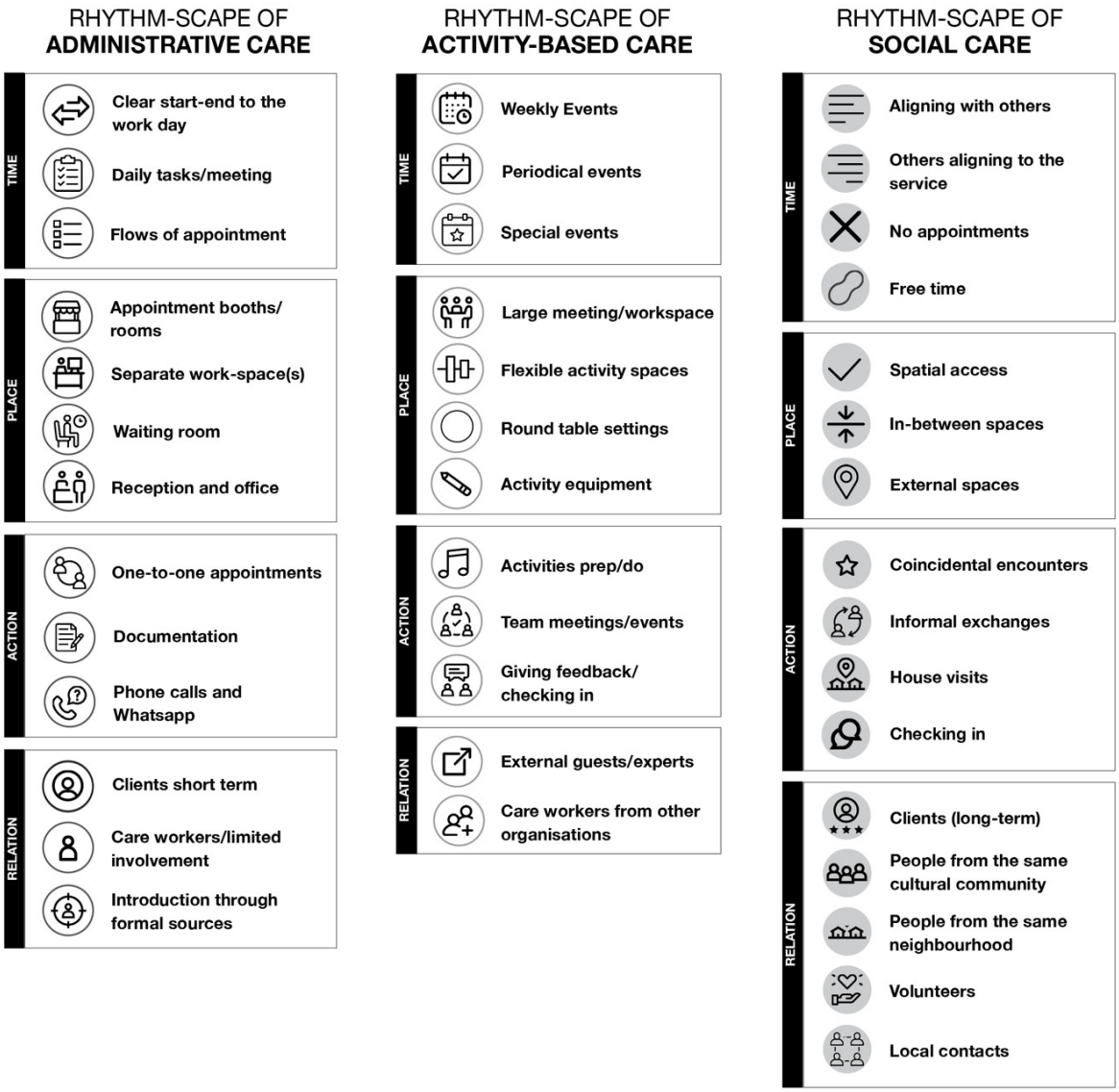

Figure 3. Visualisation of the rhythm-scapes elements for each dimension.

various urban contexts. In this sense, they are not restricted to the issue of trash. As the main idea of the concept suggests, the design proposals may focus on the internal characteristics of the rhythm zones, through which the spatial and temporal rhythmic elements that constitute them can be altered. Or, interventions can be made to create a harmonious encounter of rhythm zones, focusing on their external properties. In other words, introducing spatial design interventions in outdoor spaces or the different functionalities also changes the rhythm zones. Moreover, transforming one rhythm zone may also impact others, creating harmony or a clash as they encounter each other.

The case study on youth care services has established that places like care organisations and institutions also have their rhythm, impacting the urban environment. Often disregarded as an area of study in architecture, such places are significant for many, especially in disadvantaged urban areas. Capturing the rhythm-scapes singularly through identifying and documenting their rhythmic elements and detecting the combinations of rhythm-scapes can be helpful in both research and practice. While solutions could focus on enhancing the elements in the rhythm-scapes' time, place, action and relation dimensions, the concept invites spatial researchers and practitioners to recognise the diversity of rhythm-scapes that organisations and institutions present in their daily services.

Finally, the case study on the COVID-19 pandemic showed that urban activities incorporate rhythm spheres of bubbles, foams or globes, depending on the spatial proximity, temporal frequency and synchronised engagement they create. The interplay of spheres in the urban context enables the emergence of community life. From the perspective of sociological research, the concept allows for a better understanding of the notions that flourish in urban community life. Furthermore, the spatial implications of the spheres can be further explored in architecture to better address the possibilities of transitions from one sphere to another, which was highly necessary for pandemic preparedness.

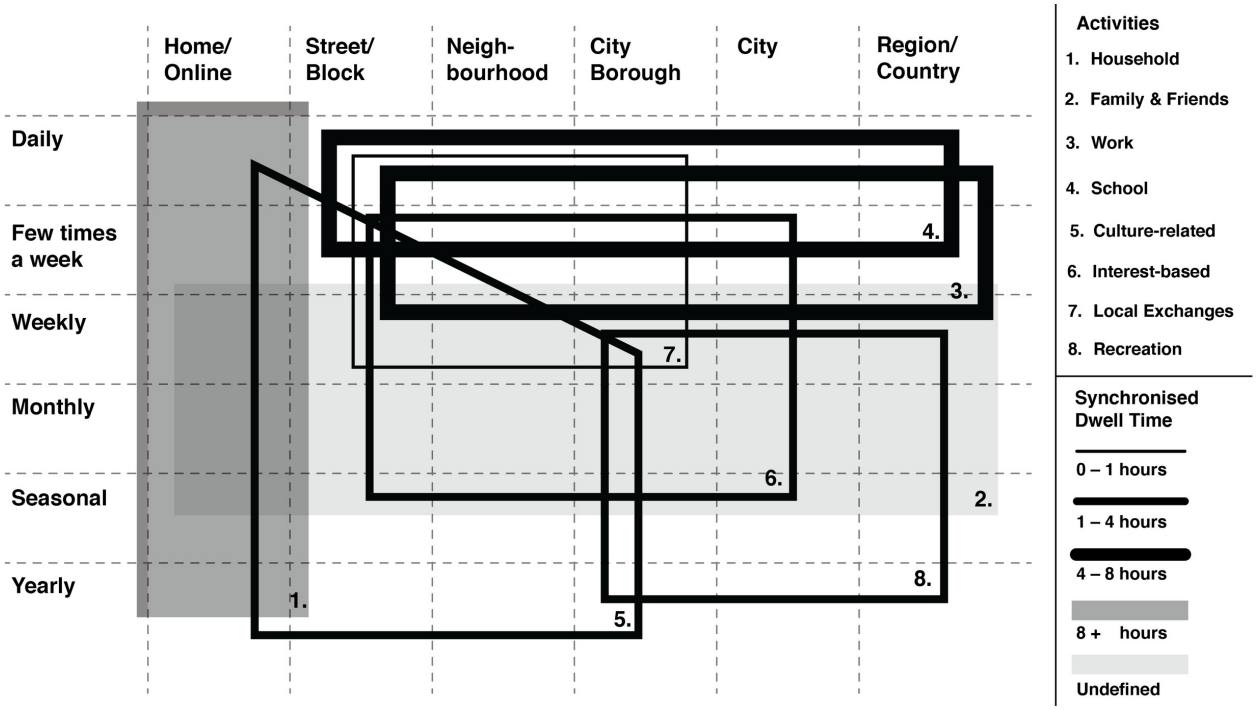

Figure 4. Visualisation of the urban activities in the spatio-temporal proximity and frequency chart.

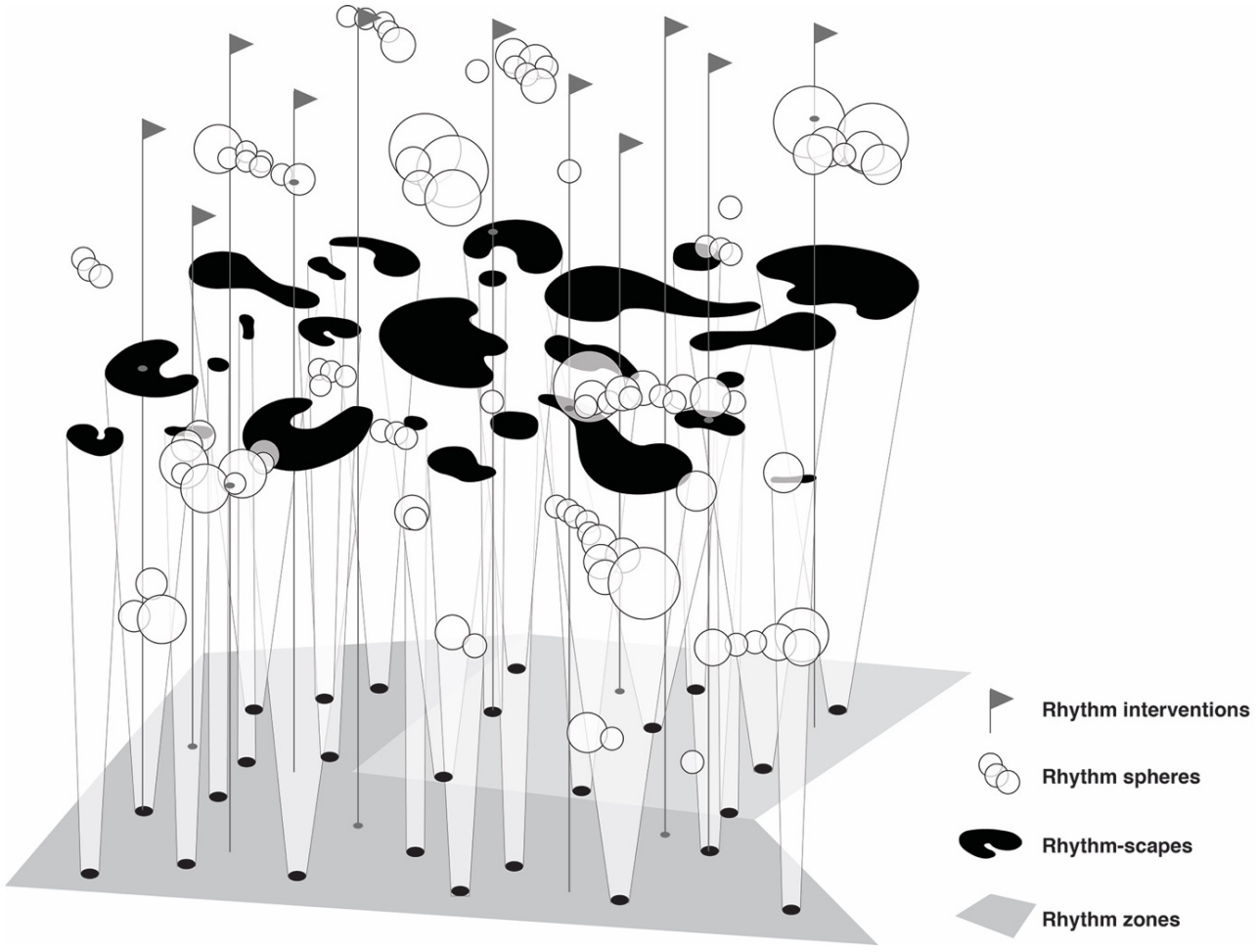

Figure 5. A proposal for an integral design framework with rhythm zones, scapes and spheres.

By bringing together architecture, sociology and rhythm analysis, the three concepts expand how we view social life in cities and create the potential to enable novel design approaches in space and time. This contribution presented the three concepts as separate entities. However, the dynamics that constitute them can be considered to interact in the urban environment, considering that it is in continuous flux and change. In this sense, the three concepts do not build on to each other but complement each other in the deeper understanding and descriptions of the urban fabric. When we make a design proposal for a building, public space or a simple detail in the outdoor environment or indoors of an existing place, we actively deal with the rhythm zones, rhythm-scapes and rhythm spheres in the urban environment. A design intervention, therefore, may be affecting all three of them together. Future research can focus on this interplay, further developing the identified concepts and their methodologies for spatial design interventions to address the dynamic value of the urban social context.

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A Reading of Architecture Through Bergson's Schema of Memory

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Keywords: Architecture, Philosophy, Bergson, Memory, Time

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Humankind has always searched for a stable background upon which human action could unfold – stable institutions, values, traditions, etc. We endeavour to create societal structures that endure not only for our time but for all times and all people. Memory and identity are critical in these structures. Change is continuously resisted, particularly the change of values. Thus, we have an inherent cultural assumption that regards works of architecture as something fundamentally stable and lasting forever, or at least to embody a particular attitude of permanence. The paper offers an alternative understanding of architecture, one that includes the transience of change and the agency of time. Through Henri Bergson's philosophy – i.e. his theories of duration, perception, and memory – I will try to demonstrate the ontological status and agency of memory in the production, reading, and experience of works of architecture.

Bergson's philosophy can unveil new readings of architecture, the built environment, and new ways of understanding its practice and theory. A Bergsonian understanding of architecture is distinct from the phenomenology of Husserl or Heidegger. While for the phenomenologist, consciousness is the consciousness or experience of something, i.e. an object of experience; for Bergson, consciousness is something, i.e. the encounter of perception with memory, matter with mind, the objective with the subjective, and the actual with the virtual.

In this paper, I will first briefly summarise some of the foundational ideas of Bergson's philosophy, i.e. his theory of duration, his proposed method of intuition, and the notion of matter as an "aggregate of images". Secondly, I will provide a description of Bergson's proposed schema of memory – the theoretical conceptions of a 'pure perception' and a 'pure memory', the workings of memory-images within his conception of matter and its relation to the virtual and the actual, and his proposed schema of memory. I will then apply his theory and schema of memory to a concrete example of a work of architecture, i.e. the chapel in Ronchamp by Le Corbusier. In conclusion, I will reflect on the main advantages for this Bergsonian approach to architecture, in both the understanding of existing works and its potential as a creative method of practice.

1. The Foundations of Bergson's Philosophy (a very brief summary)

Bergson invites us to think of time as intrinsic to our subjective experience rather than as a measurement of space. He understood the nature of reality as transient and in constant change. His theory of 'duration', which permeates all of his philosophy, is a dynamic system where time is constantly unfolding becoming more than the sequence of moments. Early in his philosophy, Bergson raises an important criticism, that we have the tendency of spatialising time. By using time as a mere measurement we ascribe positions to things in space; it makes time an abstraction to make sense of the world around us. This tendency also raises confusion between two distinct kinds of multiplicities – discrete multiplicities, defined by differ-

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ences of degree, inherently quantitative and homogeneous; and continuous multiplicities, related to subjective experience, non-divisible, qualitative and heterogeneous. The first kind is characteristic of spatial extension, where we can juxtapose things to be counted, divided and abstracted so we may act upon them. The second kind is characteristic of temporal extension, can only be grasped through the experience of things, is indivisible, and never repeated. We can summarise the concept of duration as the heterogeneous and qualitative multiplicity of the universe, characterised by the continuous change of things, including people, objects and the world itself, each with an individuated rhythm. Bergson notes that the erroneous habit of spatialising time emerges from a tendency of the intellect in its attempt to act upon matter[1], and to disrupt this habit, he invokes that it is necessary a certain "violence" to the habits of the mind (Bergson, 1912, p. 63). From this observation, he concludes that there are two distinct kinds of knowledge:

> "The first implies that we move round the object; the second that we enter into it. The first depends on the point of view at which we are placed and on the symbols by which we express ourselves. The second neither depends on a point of view nor relies on any symbol. The first kind of knowledge may be said to stop at the relative; the second, in those cases where it is possible, to attain the absolute." (Bergson, 1912, p. 1)

In other words, relative knowledge, objective, from an exterior point of view, where things are divided and abstracted into discrete parts and analysed separately from the whole, characteristic of the intellect; and absolute knowledge, where things are not divisible nor static and can only be grasped from a kind of empathy with things, or as Bergson notes, a "sympathy" inserting us into the interior of things (Bergson, 1912, p. 7). To attain this kind of "absolute" knowledge, Bergson appeals to a radical method, i.e. intuition. We shouldn't confuse this intuition as a superficial feeling or impression; instead, it is a profound interior experience in which we force ourselves to adopt the concrete movements of reality; a kind of widened perception that enables us to see beyond the immediate perceptions of things and grasp their duration.

The above is an extremely brief exposition of Bergson's main philosophical ideas. Although each deserves a more complete explanation, I mention them here as a theoretical background to understand Bergson's schema of memory, which follows.[2]

2. Bergson's Schema of Memory

Bergson conceives of matter as an "aggregate of images", he says:

> "Matter, in our view, is an aggregate of 'images'. And by 'images' we mean a certain existence which is more than that which the idealist calls a representation, but less than that which the realist calls a thing – an existence placed halfway between the 'thing' and the 'representation.'" (Bergson, 1896/1991, pp. 9–10)

There is an essential distinction in the above statement between the concept of image and of representation. While a representation can be understood as a kind of mental snapshot, an abstraction of something that has a correspondence with the real, an image, in Bergson's view, is dynamic and participates in the rhythms of reality and are as fluid and susceptible to change. We can, therefore, relate representation with the kind of relative knowledge that Bergson illustrates and image with the kind of absolute knowledge. Thus, it is through the method of intuition that the perception of images is possible. If we only resort to the habits of our intellect, we end up with abstract representations, which, although correlate to something in reality, remain static and cannot refer directly to the "thing-in-itself".[3]

Bergson notes how the images that constitute matter are not all entirely perceptible, particularly when considering the two kinds of extension mentioned above – spatial and temporal. Bergson observes that we acknowledge the existence of all things in space, even though we may not always perceive them; however, things in time have a limited existence, i.e. only what is present has existence. He explains this with a simple diagram, where the horizontal axis represents all objects juxtaposed in space, the vertical axis represents all objects in time (i.e., our recollections), and the intersection of these axes is the present moment. We can consider the following scenario: when in a room, we do not deny the existence of things beyond that room, even if we do not perceive them (other rooms, a street, other buildings, people, things, etc.); however, we deny the same logic to things in time, unless they are part of our present perceptions or metal state (i.e. the recollection of a specific memory). Bergson concludes:

> "Space thus appearing to preserve indefinitely the things which are there juxtaposed, while time in its advance devours the states which succeed each other within it." (Bergson, 1896/1991, p. 143)

1 Bergson provides an analysis of the tendencies of the intellect and of instinct in the publication 'Creative Evolution', where he applies his philosophy of duration to the discipline of biology.

2 For further development on Bergson's philosophy see his original texts 'Time and Free Will' and 'Matter and Memory', or Susanne Guerlac 'Thinking in Time', Mark Sinclair 'Bergson' and Ansel-Pearson 'Bergson: Beyond the Human condition'.

3 There is an inherent criticism of Kant and Descartes within Bergson's philosophy. He simultaneously opposes the Kantian notion that we cannot ever attain the thing-in-itself and Cartesian dualism. For further exposition see Bergson's 'Introduction to Metaphysics' and his introduction in 'Matter and Memory'.

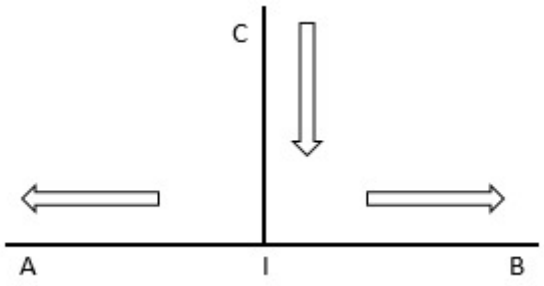

Figure 1. The two directions of perception, in Bergson's "Matter and Memory", p143.

To resolve this problem (concerning the reality of memory), Bergson proposes the distinction between actual and virtual states. Thus, memories may be actualised and perceived in the present moment but also preserve an entirely virtual existence beyond perception. For Bergson, the virtual is just as real as the actual and has agency over how we understand things. Although it is from the present that we appeal to memory, not all memories are simultaneously revealed; some remain obscured. Bergson gives the analogy of the focusing of a camera in how these images begin to materialise in our consciousness (1896/1991, p. 134). Regarding the notion of image, he says:

> "Here I am in the presence of images, in the vaguest sense of the word, images perceived when my senses are opened to them, unperceived when they are closed. All these images act and react upon one another in all their elementary parts according to constant laws which I call laws of nature [...]." (Bergson, 1896/1991, p. 17)

The movement between virtual and actual provides an understanding of how we recall memories and provides the past with a real existence. However, it still does not identify where memory, resides. A common misunderstanding is to answer that memory exists in the brain. However, Bergson is against this notion, memory cannot be contained in the brain as if we are dealing with an archival system. In Bergson's view, the brain is merely a centre for processing information.[4]

> "The brain is no more than a kind of central telephonic exchange, [...] an instrument of analysis in regard to the movement received and an instrument of selection in regard to the movement executed." (Bergson, 1896/1991, p. 30)

Bergson does not deny a relationship between consciousness and the brain. His argument criticises the notion of containment and treating the brain as something separate from the world; particularly from his definition of matter as an "aggregate of images". The brain (as all matter) is not isolated; Ansell-Pearson describes Bergson's view of the brain as "part of and from 'life' treated as a sphere of praxis and activity"(2010, p. 64). He continues:

> "The brain is in the world, not in the head, and it's only a small part of life of the organism, the part which is limited to the present. Bergson's starting point is to criticise the notion of some detached isolated object, such as the brain, as the progenitor of our representation of the world. The brain is part of the material world. [...] The body is a centre of action and not a house of representation." (Ansell-Pearson, 2010, p. 64)

Developing his theory of memory, Bergson proposes two regulatory ideas, i.e. 'pure perception' and 'pure memory'.[5] The first is directed towards the immediate present and the actions of the body. To understand 'pure perception', Bergson imagines a being with no memory: "[...] a being placed where I am, living as I live, but absorbed in the present and capable by giving up every form of memory, of obtaining a vision of matter both immediate and instantaneous" (1896/1991, p. 32). This perception is our direct encounter and contact with matter, our immediate present. It is subtractive in the sense that all other peripheral data is removed; it has no past or memory, and no future can be imagined. Guerlac suggests that "in principle, Pure Perception would coincide with matter itself" (2006, p. 117). On the other hand, a 'pure memory' is directed towards the past and, therefore, entirely virtual and akin to a pure idea. However, for Bergson, these are only theoretical propositions; perception and memory, although distinct in kind, are always mixed. He says:

> "There is no perception which is not full of memories. With the immediate and present data of our senses, we mingle a thousand details out of our past experience. [...]
> Our perceptions are undoubtedly interlaced with memories, and, inversely, a memory [...] only becomes actual by borrowing the body of some perception into which it slips. [...] perception and recollection, always interpenetrate each other, are always exchanging something of their substance as by a process of endosmosis." (1896/1991, pp. 33, 67)

It is from the present that we appeal to memory through our perceptions. If we consider the movements between

4 The notion of non-containment of the brain has been supported by recent discoveries in neuroscience research, e.g. in António Damásio (2006). A contemporary analogy can be, e.g. the computer microprocessor and its relationship to all other computer components, similar to the relation of the brain to the body. The microprocessor performs arithmetic operations, and its primary functions are to fetch, decode and execute instructions, to transfer data between different components, and to respond to different externally produced inputs. It does not retain or store information, it simply manages and administers following the needs of other components.

5 This concept of a 'regulatory idea' comes from Kant and is understood as something that doesn't exist as a thing in the world but serves to better grasp a concept by isolating it and taking it to its most extreme consequences. Bergson notes that the concepts of a 'pure perception' or 'pure memory' are only theoretical.

perception and memory, the more we move towards perception, the more we engage with the immediate contact of matter; the more we move towards memory, the more we engage with the virtual images that constitute matter. This schema of memory then seems to have a dual function; on the one hand, it extends and interweaves the past with the present; on the other, it threads a multitude of moments into a single intuition, contracting the duration of things into perception. Bergson says:

> "Memory, inseparable in practice from perception, imports the past into the present, contracts into a single intuition many moments of duration." (1896/1991, p. 73)

For Bergson, memory is "coextensive with consciousness" (1896/1991, p. 151). In other words, that which does not act in the immediate present may cease to be conscious to us; however, this does not mean it ceases to exist altogether. He says:

> "[...] consciousness may not be the synonym of existence [...] The chief office of consciousness is to preside over action and to enlighten choice. [...] all else remains in shadow. [...] Restore to consciousness its true role: there will no longer be any more reason to say that the past effaces itself as soon as perceived that there is to suppose that material objects cease to exist when we cease to perceive them" (1896/1991, p. 141)

To illustrate the workings of memory, Bergson suggests the figure of an inverted cone. The lower plane, external to the cone, is the plane of existence; it represents objective reality and, therefore, spatial extension. Point S, the cone's apex, is our immediate present, the moment of contact with all the perceptions space can afford, thus, all possibilities for action. The successive planes (AB) represent the virtual multitude of planes where memory, resides. However, we should not take this illustration as a mere representation of the working of memory; we must infuse it with the necessary motion of things. I.e., point S is never static and is always in continuous movement (even when stationary, our sense organs continuously receive data from the world around us); the memory-images that exist in the virtual planes (AB) are also in constant flux, ever contracting and combining with perceptions or expanding back into the cone, retrieving into shadow and unconsciousness.

In Bergson's words:

> "[T]he mind travels unceasingly over the interval comprised between its two extreme limits, the plane of action and the plane of dream. [...] but the action is not able to become real unless it succeeds in encasing itself in the actual situation, that is to say, in that particular assemblage of circumstances which is due to the particular position of the body in time and space. [...] The activity of the mind goes far beyond the mass of accumulated memories, as this mass of memories itself is infinitely more than the sensations and movements of the present hour; but these sensations and these movements condition what we may term our attention to life, and that is why everything depends on their cohesion in the normal work of the mind, as in a pyramid which should stand upon its apex." (1896/1991, pp. 172–173)

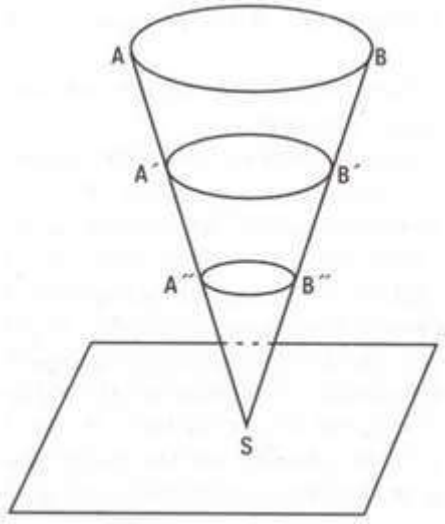

Figure 2. Bergson's diagram for his schema of memory, in 'Matter and Memory', 1896, p162.

3. A Bergsonian Reading of Architecture: A Chapel in Ronchamp

We tend to perceive architecture as a stable and fixed image. The ways we produce and understand buildings are inherently spatial. However, when we compare architecture against other art forms, we verify that architecture is only fully understood when experienced through time. We can look at a painting or a sculpture from an alienated position and build an understanding from our observation – a relationship between the object and its observer – but in the case of architecture, we must move through it, rely on our unfolding perceptions and experience. Thus, the moment of contact between our individual psychic life and a particular space strikes us as unique. It is like a strike of lightning that will never repeat itself, which, for a moment, intertwines our character, identity, and our own memories with the experience of that space in a common duration.

Bergson inserts the subject into the real, not as an observer, but as an integral part of the images that constitute the universe, putting subjectivity and objectivity on equal terms. Through his philosophy of memory, i.e. the notion of virtual memory-images, Bergson opens the horizon of existence beyond what we can perceive, rendering the virtual past with an ontological status and agency. Certainly, buildings do not possess an inner psychic life. However, they have history, and memories can be substantiated or embodied in their walls. Time and time again, the notion of memory is evoked in relation to architecture, either as social memory, e.g. monuments, a form of memorialising an event or architecture's participation in history, or as vernacular memory, a way of doing or making (Anderson, 1999). However, the question of how memory become embodied or materialised in architecture is often neglected. So, how can Bergson's theory of memory to provide a better understanding of architecture? Particularly when he did not

address the discipline of architecture, except for one paragraph in the introduction to 'Time and Free Will'.

> "We find architecture, in the very midst of its startling immobility, certain effects analogous to those of rhythm. The symmetry of form, the indefinite repetition of the same architectural motive, causes our faculty of perception to oscillate between the same and the same again, and gets rid of those customary incessant changes which in ordinary life brings us back without ceasing to the consciousness of our personality: even the faint suggestion of an idea will then be enough to make the idea fill the whole of our mind. Thus art aims at impressing feelings on us rather than expressing them [...]." (Bergson, 1889/1910, p. 15)

So far, I have focused Bergson's philosophy and his schema for memory. However, theory must be useful, it must function (Deleuze, 1972). Following I will apply Bergson's schema to a specific work of architecture, i.e. Le Corbusier's design for a chapel in Ronchamp. The first step is to construct an understanding of the different kinds of memories that intervene in the production and appreciation of the architecture; some are related closely to context, others correlate formaly with more distant objects, others perhaps more unconscious are present through the architect's subjective experiences. Secondly, it is to verify if Bergson's schema holds in demonstrating how a diverse source of memories can form the ground for the work itself.

The context of the chapel carries with it a history and memories of its own. Le Corbusier's chapel replaces a prior one severely damaged during WWII in the autumn of 1944. However, the site has been a place of pilgrimage since at least the 9th century, and this existing chapel had already been a reconstruction and extension of another chapel struck by lighting in 1913 (Pauly, 2008, p. 50). Beyond the religious significance of the site and its history of destruction and rebuilding, there is also the landscape. On his first visit to the site on June 4th 1950, Le Corbusier said:

> "On the hill, I had meticulously drawn the four horizons. [...] It was they which unlocked, architecturally, the echo – the visual echo in the realm of shape." (Pauly, 2008, p. 52)

Canon Ledeur, secretary of the *Besançon Comission d'Art Sacré*, who had recommended the appointment of Le Corbusier, recalls the initial sketches drawn by the architect:

> "I can remember so well his immediate reaction to the site: the first line he drew – this south wall (tracing a curved line). Next he visualised the pilgrims in front of the wall, where he placed the altar whose curve echoes that of the south wall: this is the east wall; and then all he had to do was to join the two curves together!" (Pauly, 2008, p. 52)

These initial sketches and reactions demonstrate how the production of a work of architecture never exists in a vacuum; at the very minimum, there is at least a topography (a surface) and an environment. This context already furnishes possibilities – affordances, which according to Gibson (1977), are the perceptions of the possibility for action. From Bergson, we already saw that perceptions are always interwoven with memory. Le Corbusier identifies these initial sketches as a "dialogue" and "response" to the site:

> "The conceptual process was not abstract, but rather responded to a sensation, to a visual and sensory experience, namely transcribing onto the plan the contact established with the site and the four horizons." (Pauly, 2008, p. 59)

The chapel's design emerges from both actual and virtual factors: the physical constraints of the landscape, like the four horizons or the ascension to a sacred space atop a hill – something already noted by Le Corbusier in his sketches of Delphi (Providência, 2022, p. 24) – and virtual factors like the affordance of potential experiences and actions, or the religious significance of the place. A crucial point should be raised: not only does architecture emerge from pre-existing memory-images and perceptions, but also from virtual possibilities not yet actualised. Bergson distinguished that, although they are always mixed, perception and memory are different in kind; however, the distinction between memory and imagination is not as clear – both are entirely virtual and akin to idea. The difference may be of degree, depending on the tendency towards the past or the future. However, assigning a direction to time falls into Bergson's original criticism that we tend to spatialise it. As Bergson noted, memories are appealed to from the present moment with a view towards a potential action raised by perception; although a past recollection, there is something of potentiality in memory. In the context of creativity, imagination, usually associated with the future, can never emerge from nothing[6]; there is always a pre-existing ground or surface. Therefore, the difference between memory and imagination may be just the direction perception is turning towards.

However, the memory-images from which architecture emerges are not only those of the place; other forms of memory are at play. Some come from the architect's own experiences and can be appealed to consciously and unconsciously. I have mentioned Le Corbusier's travels to the East, i.e. his visit to Delphi, and other correlations can be established, i.e. the architect's sketch of the great wall of the Naqsh-i-Rustam necropolis in Iran and the initial carvings on the chapel's south wall; the constructions under rock formation at el Puig de la Balma, Saint Llaurenç del Munt National Park, a location the architect was familiar

6 Fro further exposition see Bergson's essay ' The possible and the Real' in 'Creative Mind', and the essay on 'The Idea of Nothing' in Chapter four of 'Creative Evolution'.

with from his proposal for Sainte-Baume; or the architect's experience with the architecture and culture of the M'Zab Valley in Algeria (Providência, 2022, p. 30). The M'Zab vernacular is particularly interesting in its relation to Ronchamp. The mosque of Sidi Ibrahim at El-Afteuf, also a place of pilgrimage, has its access through a path that navigates the landscape. It presents similar triangular openings and thick walls with white roughcast; these walls reveal a certain plasticity in their form. The openings control how light enters the space, diffusing it; in the interior, cavities are carved into the wall. At Ronchamp, we find many of the same elements. The correspondence between the mosque and the design of Ronchamp is not the copying or referencing of one building to design the other; it is the architect's conscious or subconscious memory informing the design. Memories that have been sketched and reinforced into the mind become materialised again. However, memory is not (re)materialised precisely how it was before or in the same form; memory is actualised in the resolution of the design problem, not in an objective manner but intuitively, guiding the hand of the architect.

Other memories emerge from what Le Corbusier called '*objects á reaction poétique*', a collection of objects from which he drew aesthetic research, e.g. the crab shell used as a device to resolve the structure of the roof or the clipping of a hydroelectric dam section found in the architect's file entitled "*documents preparation Ronchamp.*" (Pauly, 2008, pp. 59, 72–73). Other objects or constructs are brought into play *a posteriori,* from the appreciation of the work by others, after the fact, e.g. the association of the chapel with archaic pre-historic structures like the Dolmen (Providência, 2022, p. 40). Some memories were intentionally embodied into the fabric of the chapel, i.e. the reuse of the pre-existing chapel's rubble into the walls of the new chapel and the 'Pyramid of Peace' memorial constructed on site. Finally, the material produced by the architect also forms additional objects of memory – sketches, annotations, models, etc. Providência (2022) notes:

> "[Ronchamp] was conceived under the sign of metamorphoses of memory and appears as a particular case of objects of memory, *memorabilia*, as a resource in the design process. For Le Corbusier, a collector and persistent producer of memories associated with his experience, these objects take on various shapes and configurations. […] To these physical objects, be they a collection of pipes or stones, we will have to add the visual elements and notes produced by the architect himself, such as journal annotations, collected postcards, photographic records of travels or plastic experiments, architectural design drawings or constructed models. They are referred to in previous narratives or incorporated in the publications made, extending the concept of memory object to all objects built by the architect himself." (Providência, 2022, p. 20)

I have illustrated the sources of memory in this particular case; although this does not represent a complete inventory of all potential sources, it demonstrates the sheer variety of how memory can be appealed to and embodied in a work of architecture. Applying this to Bergson's schema involves an effort to not make these memories stagnant representations, which are then somehow abstractly applied to a design. On the contrary, we must consider these memories transient images in constant flux, providing an openness for new memories to be continuously added and brought forth. Such an understanding of architecture brings it closer to the idea of the event rather than the notion of an object. If we consider the variety of durations as distinct rhythms, we can conclude, as Bergson did, that the slowest rhythms, almost imperceptible, begin to coincide with perception, i.e. with matter itself. Architecture becomes an "aggregate of images", never entirely matter or idea, never entirely actual or virtual, but the intra-relationship of all durations, i.e. time. I propose the following diagram, which applies Bergson's schema to the chapel at Ronchamp; however, with the note that such a static diagram merely represents another whose movement is ceaseless.

4. Conclusion: Architecture as an 'Aggregate of Images'

Bergson proposes a genuinely active memory that participates in the present and the future's making. The past is no longer just an ephemeral idea or representation of a mental state; it has agency. We appeal to memory-images from the present, condensing them from the virtual state and effectively actualising them. An object is not only what we afford but also what we bring and gather – a constant movement effectively extending memory into the world. Bergson's schema preserves a high degree of indeterminacy. Indeterminacy is the very fabric and nature of reality; it is the plasticity, openness, and production without a foreseen result. "Plasticity means developing across time so that time, rather than space, becomes the organising principle." (Bell, 2004). Through this creative movement between different durations, true novelty emerges, and the design process becomes a truly iterative and creative gesture, not a series of abstractions. Through a Bergsonian understanding, architecture becomes more understood as an unfolding event with its own durations instead of a stable, immutable object. Such an understanding opens new avenues, not just for appreciating the built environment but, more importantly, for the epistemology, production and design of architecture.

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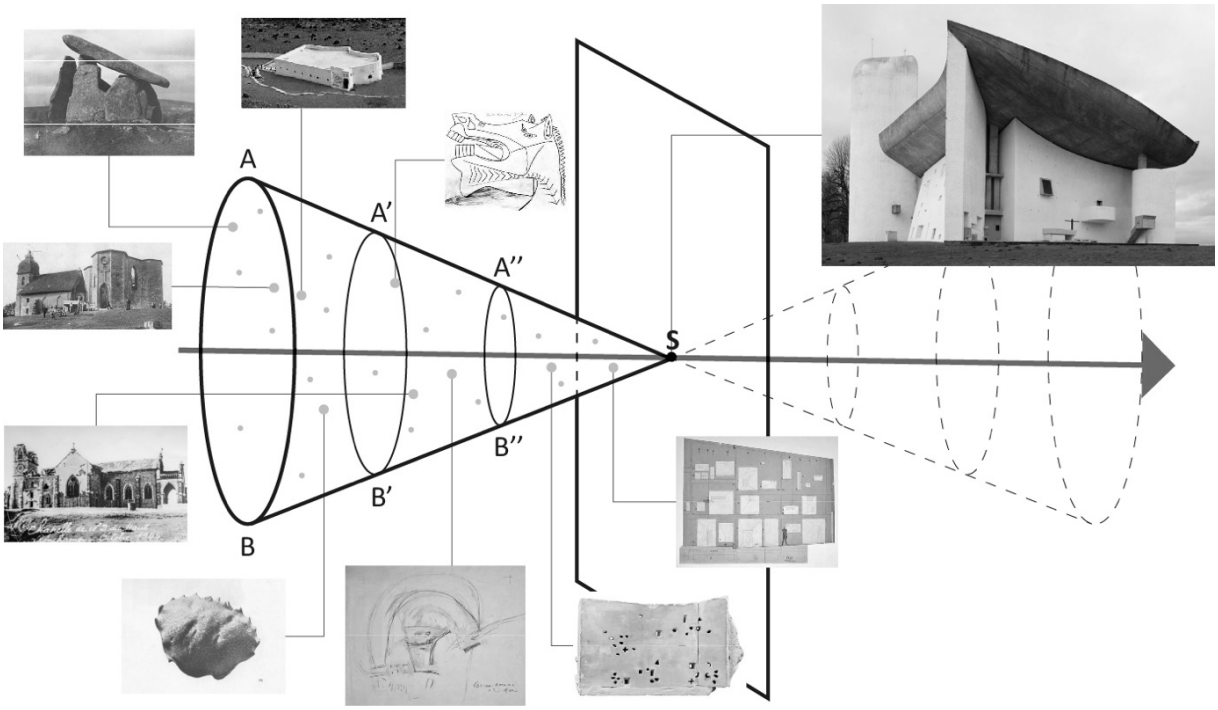

Figure 3. Memory cone diagram of the chapel in Ronchamp

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Unveiling Geographies Through Infrastructure: The Mantua-Peschiera Branch Line as a Palimpsest

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The research paper titled “Unveiling Geographies Through Infrastructure: The Mantua-Peschiera Branch Line as a Palimpsest” presents key findings from my doctoral research, presented in May 2021. The original thesis, “The Mantua-Peschiera Railway as a Case Study for a Historical Analysis Method and Regeneration Project,” explored an innovative historical data-driven method to develop a regeneration project for the abandoned railway line.

This paper highlights the distinctive characteristics of the Mantua-Peschiera railway, using it as an exemplar of neglected branch lines and advocating for the recognition of their significance in studying geographical areas as historical palimpsests. Through meticulous analysis of archival materials and railway history literature, the research underscores a detailed understanding of branch lines and their intrinsic connection to the *Paesaggi Umani* (the Human Landscapes) they traverse.

The study draws attention to the infrastructural nature of railways as connectors of places and people, emphasising their initial role in the colonisation of landscapes. Today, we face the challenge of “decolonising” these landscapes, particularly in Italy, where abandonment has led to vast inland areas dwindling in population. The PhD thesis argues for a reinterpretation and revitalisation of these spaces, moving away from a legacy of colonisation towards a sustainable and engaged reintegration with the surrounding environment.

The outcomes of this analysis are showcased through representations that illustrate the complex coexistence of past and present. By treating the Mantua-Peschiera branch line as a palimpsest, the paper reveals the physical remnants of the railway and the layered human narratives embedded within it. The ultimate goal is to elevate the discourse around abandoned railway lines, transforming them from relics of the past into active architectures in the narrative of regional development and community cohesion.

This contribution to the field sheds light on the potential of historical branch lines as catalysts for regional transformation. It provides a framework for similar studies to improve heritage preservation actions with contemporary infrastructural demands.

1. The Mantua-Peschiera railway

The idea to construct a railway line between the city of Mantova and Peschiera del Garda in the Pianura Padana area was promoted by local initiatives shortly after the unification of Italy in 1861. In 1879, local engineer Giuseppe Benati led the effort with a general proposal, starting a long and debated history of financial proposals and requests for funding from the central government. The main parties involved were represented by Municipalities and Provinces affected by the railway’s route, which saw in the new infrastructure the possibility of new opportunities for developing the local economies of the Valle del Mincio (Mincio’s valley). While the local public offices advanced the discussion at the Ministry of Transport, on the other hand, public

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opinion asked for its realisation through the press, as testified by several articles in the local newspapers of the time.

The development of the project proposal was a lengthy process, with discussions starting in 1890. By 1905, the project *Progetto di Massima per la Ferrovia Economica a scartamento ordinario Mantova-Peschiera* was formally designed, driven by the aspirations of the *Consorzio per la Ferrovia Mantova-Peschiera* (Consortium for the Mantova-Peschiera Railway). The proposed project closely resembled the eventual construction of the line, yet no documentary evidence survives today aside from historical photographs and cadastral records. The surviving documents, including the only remaining graphical depiction, serve as a textual reference, pinpointing locations, waterways, and roadways by their original names—vital for orientation and understanding the places at that time.

In the wake of establishing the *Società Anonima Ferrovia Mantova-Peschiera* (Mantova-Peschiera Railway Company) in 1913, the group secured a concession from the Italian Ministry of Transport to construct and operate the railway. This agreement included a guarantee of a per-kilometer subsidy over a fifty-year period. However, the project faced setbacks, including difficulty securing funds and the outbreak of the First World War, delaying construction until 1921.

Figure 1. Federico Marcolini: the Ferrovia Mantova-Peschiera and its proposals, 1:25000 orig. scale, General Plan, Ing. Arvedo Arvedi, 1905, Archivio di Stato di Mantova, Fondo Camera di Commercio, Parte Seconda, Busta 286, Courtesy: Archivio di Stato di Mantova.

Following successive extensions, the line was completed only at the end of the 1920s and then entrusted in sub-concession to the *Società Anonime Elettrovie Romagnole* in 1932 with a modification of the concession pacts by the state in 1934, the year in which the line was inaugurated and activated using locomotive with steam propulsion. The activation had to wait until 1934 due to the discussion regarding the authorisation for circulation on the Mantova Sant'Antonio section owned by FS (*Ferrovie dello Stato*).

2. From Theory to Tracks: Stanislao Fadda's Railway Manuals and Their Impact on the Mantova-Peschiera Branch Lines

Thanks to the concession regulations of 1879[1], not only was the Mantova-Peschiera railway constructed, but many other *ferrovie secondarie* (branch lines) were also developed, following processes similar to the one just described (Briano, 1977).

Almost all initiatives for constructing branch lines had local communities as their initial promoters, represented by public interest such as Municipalities and Provinces. Indeed, the legislation's goal was to promote new lines to complete the railway network of the Italian Kingdom, proposing economical construction and operation systems for all those railways that did not have the characteristics of main lines.

While the diffusion of secondary, or more precisely, »economic« railway (branch lines) networks were spreading, on the other hand, engineering was the reference discipline for their construction. The practice was also related to the numerous railway manuals, authentic practical guides for constructing and formulating projects and related works (Purcar, 2007). This practice, common to all railway constructions and especially, as Maggi suggests (2003), for the realisation of branch lines, often referred to a series of 19th-century publications that owed much to the French contributions of the second half of the 19th century[2], to which Italy only at the turn of the two centuries managed to contribute, also becoming a technological reference, thanks mainly to the experiences gained from the construction of the Gotthard and Frejus tunnels or other ventures linked to the very rugged morphology of the Italian territories, which forced engineers to continuous experimentation (Bigatti & Canella, 2014).

One of the most exhaustive texts regarding railways is the multi-volume collection by engineer Stanislao Fadda titled *Costruzione ed Esercizio delle strade Ferrate e delle Tramvie* (Construction and Operation of Railways and Tramways), started in 1887 and continued until 1912, published in Turin by the Unione Tipografico Editrice (UTET). The unstudied work presents itself as a true railway encyclopedia consisting of innumerable chapters written by a dense group of experts, 8,000 pages of text with 10,000 figures and more than 900 plates (lithographs) and an album composed of 100 tables. Ing. Fadda's work, like the manuals in general, strongly emphasises how each element contributes to the definition of the railway itself, a unitary system and architecture in which the absence of one of its elements prevents the correct functioning of the whole.

1 Law No. 5002 (Baccarini) of July 29, 1879, for the construction of new lines to complete the railway network of the Italian Kingdom, proposed the use of economical systems of construction and operation for all those railways that did not have the characteristics of main lines.

2 The reason for this direct reference to French scientific literature is due to the ability of French engineers not only to create significant railway works but also to write project reports aimed at a series of publications designed to share experiences for a faster technological development of new communication routes

Among the numerous volumes published with Fadda as leading editor, we find the one titled *Ferrovie Secondarie ed Economiche* (Secondary and Economic Railways), signed by Eng. Luigi Polese. Here, regulations, reference techniques, and some best practices for designing secondary railways are collected and probably taken as a reference for creating many branch lines of the national secondary network.

The manual aimed to guide the practice of engineers in applying the industrial conception, typical of the second half of the 19th century, imposing the consideration of railway initiatives among the industrial initiatives to achieve maximum profit with the minimum expense. At the same time, the promotion of the development of such enterprises was also due to the importance of railway networks in post-unification Italy, presenting the train as "the most powerful means of communication and transport known" (Polese, 1899, p. 5). Engineers were required to engage with a more entrepreneurial dimension, a necessity that the railways became carriers of. Alongside the drafting of the technical project, they, therefore, found themselves needing to take into account economic issues, that is, on the one hand, the expenses to be faced in their various articulations, which had to include everything from the costs required for facilities to reimbursements for expropriations to landowners, and on the other, the profits that could reasonably be expected from the initiative. The choice of one route over another, as well as the option for an alternative technological solution, weighed on the costs of the line and, in the long term, guided and influenced its design.

Within this logic, perhaps it is the branch lines, such as the Mantova-Peschiera, called »economic«, that best embody this industrial ideal since they were "intended to serve less significant centres in terms of population and production, must shed the characteristic imprint of the major lines, and consequently, an economy in operating expenses must necessarily be imposed given the very limited traffic and the modest benefits that can be expected from their operation" (Polese, 1899, p. 2).

Their economic nature promotes their development, especially in the more inland areas of the peninsula, convincing everyone "of the necessity and convenience of adopting them where the peculiar conditions of the localities impose them, as they perfectly meet the true and real needs of the small industrial and commercial centres", also emphasising the "public service character" (Polese, 1899, p. 4) that these railways had.

The name *Ferrovie Secondarie* (branch lines) pertains to a classification of railways we find already at the end of the 19th century, inspired by foreign manuals that Polese recalls in his publication (1899). Based on this distinction, the railways were therefore identifiable as:

Primarie (Main Lines): «those that are necessary so that no part of the State's territory is placed outside the greater radius of action of a railway» (Polese, 1899, p. 8)

Secondarie (Branch-railways): «those that, branching off from a main line, connect the greater radius to the lesser, and bring, under the direct action of a primary line, the countries that only felt the indirect action» (Polese, 1899, p. 8).

Locali (Short Traffic Railways): «those that, detaching from a primary or a secondary line, facilitate transport only within the smaller circle of the line from which they branch off» (Polese, 1899, p. 8).

3.»Opere d'Arte«: Living Spaces

In the volume written by Engineer Polese for the series edited by Engineer Fadda, it is interesting to note how railway facilities are referred to as *Opere d'Arte* (Piece of Art) (Polese, 1899, p. 13). From a technical point of view, the track and all its components are part of the *infrastruttura* (infrastructure) as they are necessary for the roadbed. At the same time, everything related to the operation of the line is indicated as *soprastruttura* (railway facilities), and it is presumed that it may change over time (Polese, 1899, p. 94). The economic nature of the branch lines, as repeatedly mentioned, requires excellent optimisation of the railway service and involves elements of the railway facilities to offer an economy in which the expenses of realisation and management are reduced to a minimum. However, the term *Opere d'Arte* clarifies that these elements should also be considered differently from those pertaining to the infrastructure, perhaps because they are tied to aspects not exclusively technical that involve other functions, such as that of private and public places.

Nerve centres of such facilities were the stations, with their small freight yards, often reduced to simple loading and unloading platforms, if not to a single track, from which goods could be unloaded and loaded onto ox-drawn carts. In addition to stations, along the route, there were small stops serving hamlets scattered in the countryside and crossing keeper's houses for the control of intersections with vehicular roads and fundamental to ensure the maintenance of the line (Fadda, 1889–1912, p. 1).

Geometric chronotopes that leave a footprint in the place and enable us to identify "the time of nature and the time of human biology" (García Nofuentes & Martinez Ramos e Iruela, 2022, p. 2). Such architectures propose a recognisable order, "offering a precise explanation of the differences between the circumstantial factors of its creation and its essential issues." (García Nofuentes & Martinez Ramos e Iruela, 2022, p. 3).

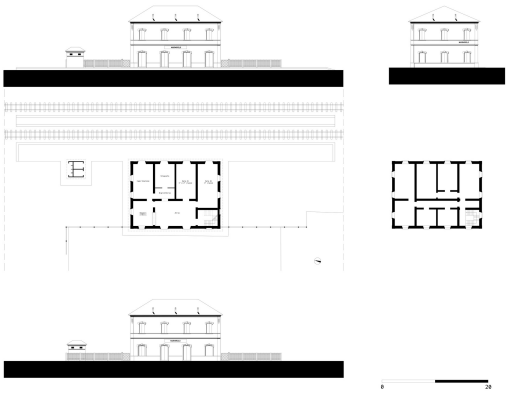

Figure 2. Federico Marcolini: the train station of Marmirolo along the Mantova-Peschiera railway. 2019.

The line was populated not only by *Opere d'Arte* but by those who inhabited them. Cassola well describes many lives tied to work in his book "Ferrovia Locale" (Local Railway), where the multiple stories of the protagonists share the railway as a place of living, work, and everyday life (Cassola, 1968). The characters of specific architectures, because this is what it is about, although standardised as far as all lines pertaining to the Main Lines were concerned, became surprisingly varied regarding the concession railways, thanks to the great freedom the companies had in realising the granted projects. Their economic nature only pertains to exceptional pieces of art. Still, they adopt the same systems of ordinary railways with differences mainly in the simplicity of details "or rather, in the absolute lack of everything that smacks of decorative or monumental things from which the works of art of the secondary railways must be exempt" (Polese, 1899, p. 113).

A scarcity of resources contributes to adopting collective intelligence, "which represents one of the values of vernacular architecture" (Rosaleny-Gamón, 2022, p. 3).

Despite the call for simplicity in architecture, engineers enriched the impeccable functional machine with moderate decorative features often taken from residential building manuals to soften the buildings by combining the function of a public building with that of a residential one (Assirelli, 1992). Indeed, until not many years ago, railway architectures were designed to house entire family units whose members, as Cassola still reminds us, actively participated in the life of the lines. Thus, the station master, the crossing keeper, the labourer, the deputy, and all those who animated those places, often lost in the territories of our Peninsula, became part of the social life of the villages and the countryside, figures as characteristic as the teacher and the priest. Moreover, railway architecture's»figurative« features were meant to indicate cultural and social significance and emphasise their territorial impact (Colleanza, 2007, p. 9). In line with the established role, the figurative features were increasingly simplified, leading to the signal cabin, one of the smallest elements among railway architectures. A perception of the collective imaginary that perished due to its disappearing but also to the changes in the landscape of the environment (Rosaleny-Gamón, 2022, p. 3).

As described in the manuals, the Mantova-Peschiera railway had essential facilities, with five stations and their corresponding goods warehouses in the larger urban centres, one stop with a loading and unloading platform, and two simple stops corresponding to some hamlets, five gatehouses at significant crossings, and a locomotive depot, all distributed at close intervals over a length of 34 km. The signage was absent and replaced by the tireless effort of the railway workers who, in thirty years of work, could guarantee a service, which, already after the Second World War, suffered from a lack of funds for maintenance (Pedrazzini, 2023). This is confirmed by a simple comparison between the first photos of the railway in service preceding the Second World War and those of the 50s and 60s, showing how the *Opere d'Arte* and their areas of competence were heavily degraded and, in some cases, downgraded in some of their functions as part of the facilities and thus more easily subject to actions of economy and service optimisation.

4. Technical Reports as Gateways

Infrastructure is not only made of technical elements but also places of living. All this is gathered in the text of technical reports attached to preliminary projects, now kept in the archive of the Ministry of Transport, where, in addition to the listing of the technological characteristics of the route and the sizing of the *Opere d'Arte* there are precise descriptions related to the geography of places and those *Paesaggi Umani* (Human Landscapes)[3] described in the *Touring Club* guides or the editions of the magazine *Le vie d'Italia* from those years (Lonati, 2011). Restitution of an imagined journey that, for those who were passengers, was made up of a double dimension: that within the railway carriage and that related to the framing of the windows open to the landscape and their perception altered by the speed of travel.

Authors like Schivelbusch (1980) or Marc Desportes (2008) have addressed the perception that these evolutions have had on the spatial framework, starting from the ex-

3 Within "Paesaggi Umani" by Toruing Club, Umberto Bonapace referes to the human landscapes as places "deeply shaped by human work". Within the volume, a series of images represented the extent of the landscapes and invited to dive into a journey through the Italian territories to admire "the endless range of interventions that humans have made on the environment" (Bonapace, 1977, p. 9). At the same time, the change already underway was denounced, in which "the resurgence of erosive phenomena, the expansion of scrub and forest at the expense of poor crops, the abandonment of the most disadvantaged centers (in the mountains and hills), are plain for all to see" (Bonapace, 1977, p. 10) and that today are the main description of vast areas of Italian territory.

perience of railway travel and a viewpoint that from the train observes all that is interior and the relationship it establishes with the external panoramas: "during train journeys, in fact, a new gaze is forged which we could define as panoramic and whose understanding imposes as a reference the contemporary forms of expression, such as photography or painting" (Desportes, 2008, p. 85).

From the confines of the compartment and the isolation of reading, the landscape that could be seen from the geometric frame of the window is a landscape that can only be observed: "a landscape crossed according to a mechanical shift and not encountered with one's own movement" (Desportes, 2008, p. 110). The literary landscape of novels, the texts in guides, and the engravings within them offered an invitation to discover the places beyond that quick snippet seen from the window. A series of snapshots of a journey, perhaps like the one collected in the book 'Viaggio in Italia' by Luigi Ghirri and Leone (1984).

Using Hugo's poetic description, the journey can be imagined as "a magnificent motion that must be felt to be appreciated of unheard-of rapidity. The flowers along the railway are no longer flowers but stains or rather stripes of red or white; there are no more points, only lines; the wheat turns into long blonde hair, the alfalfa into long green braids [...]; occasionally, a shadow, a shape, a spectre standing, appears and vanishes like a flash beside the door; it is a railway worker who, as is customary, salutes the train" (Gély, 1987, p. 611).

The traveller becomes a spectator who does not partake in the action of the journey. If, on the one hand, the view from the window is characterised by the constant change that seems to shift focus to the distant horizon, on the other hand, the traveller has the opportunity to capture a fleeting detail in sharp clarity.

"To say that nothing can be seen from the window of a compartment has become a commonplace [...]. It's true that an inattentive eye sees only a hedge or a line of telegraph poles. But after training myself for three years, getting into the habit of looking, I have made reports and sketched landscapes [...] from the window of a carriage. However, I do not advise describing a foreign country solely from the window of a carriage, because the condition for doing so is simply to know everything beforehand. The autopsy then becomes merely a confirmation of what we already know" (Strindberg, 1889, p. 108).

Following the instructions in the Technical Report for the Project of secondary railways like the Mantova-Peschiera, "it is now possible to rewrite an imaginary of the Mantua-Peschiera journey. A journey characterised not by the mere technical description of the railway but one in which the territory and its various landscapes are introduced: quoting ancient and partly forgotten place names and monumental features of the built environment that have disappeared or transformed profoundly and creating a hypothetical itinerary that, like the imaginary of the railway itself with its layout and its artefacts, is made up of traces, whether they are still recognisable or have completely vanished" (Marcolini, 2021, p. 205).

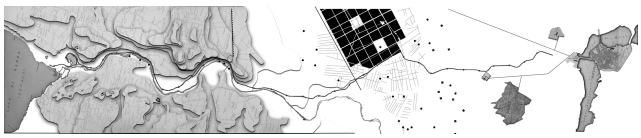

Figure 3. Federico Marcolini: The graphic representation of the Mantova-Peschiera Journey, 2020.

Figure 4. Federico Marcolini: the graphic representation of the Mantova-Peschiera Panorama, 2020.

This is a reading as Marco Belpoliti did for "Pianura" (2021), or the journey by the heteronym of Vittorio Magnago Lampugnani, Vittorio Valori Perduti (Triennale di Milano, 1987), observing places guided by the works of ancient connoisseurs or by historical documents such as maps, plans, paintings, photographs, etc. It is a complex gaze, laden with different experiences and made from an "I observe" suggested by Gregotti (2014), and understood as a subjective view of a geography that, starting from the places listed in the technical report, looks beyond those individual facts to be able to understand the territory beyond the window, and that, where stations or stops are present, offers itself for discovery (Marcolini, 2021).

Engineer Arvedi's description for the Technical Project Report of the Mantova-Peschiera railway contains a brief but significant description of the Mincio Valley and its river. An image that no longer exists except as profoundly altered, where the river's blue waters "pass quickly under the arches of the Visconteo Bridge" (Arvedi, 1905), which at that time was still interrupted. The ruin, an ideal subject for a pastoral scene of the late eighteenth century, was home to gardens and meadows where shepherds brought their flocks to graze. Throughout the first half of the twentieth century, it was a favoured subject of some local photographers like Giovetti and Calzolari[4]. Descending the river, the description swiftly mentions the towns brushed by the river and, upon reaching Mantova, describes the city as it was: an island surrounded by waters like the depicted image in the XVIth century fresco by Ignazio Danti in the Vatican Palaces. To support the description, a 1:25000 scale map was created, the outcome of a probable reworking of an old

4 Nowadays, the rich heritage of images these photographers left is stored at the Archivio di Stato archive in Mantua.

late nineteenth-century IGM - map (Military Geographic Institute), which, cleansed from the analytical excesses of the military technicians, represents what was essential of that territory to highlight the designed line better. A drawn journey, where the two-dimensionality of the map complements the generous technical project report in which some of the built environment was also cited as if to underline their value and importance. The landscapes were multiple and often similar to those described in the surveys of the late nineteenth century, in which, leaving the city of Mantova, "after crossing the lakes on two sides, and the reeds and marshes that still dishonourably surround the city from the others, the lands present themselves with an aspect that is characteristic of all those of the province's lowlands, both for the conformity of the system and for how they are cultivated with varying diligence" (Magri, 1879). A province always agricultural, as demonstrated by the fairy tales collected by Isaia Visentini at the end of the nineteenth century, which Calvino describes as characterised by a "dominant peasant colouring of the Mantuan narrative folklore" (Calvino, 1970), where well-known heroes of familiar tales are transformed into the inhabitants of those places, where Hercules is a labourer, or the three little pigs become three sisters. Mantuan stories populate the minds of those who live in these places and which the railway has certainly seen built, and that some curious photographer did not fail to immortalise, perhaps struck by that "great" white tongue of broken stones on which until the '50s a passenger convoy pulled by a steam locomotive would pass. Those who would have taken the train for Peschiera would have found the possibility to purchase a first or third-class ticket. Starting from Mantova, the first stretch would have been on the Mantova-Verona tracks, but at Sant'Antonio, it would have left the long Habsburg railway to begin a slow journey, made of many stops where the Mantuan countryside still offered suggestions tied to the nineteenth-century descriptions of some foreign travellers who, having visited the city of Mantova, ventured beyond the lakes, northwards, in search of the ruins of La Favorita or the Bosco Fontana Hunting Lodge (Cf. Schizzerotto, 1981). Along the route, beyond the changing images that could be enjoyed from the window, one would have seen railway workers busy at the stations or in the few signal boxes present. A life not directly known but which we can imagine to be similar to that described by Guido Sostaro in the memories related to the Suzzara-Ferrara railway, where being a railway worker was a privilege compared to those who worked the land (Sostaro, 2009). It is a journey to discover a real country, made of people who have redeemed this territory, and which is sought to be reconstructed starting from the only "exhaustive" document left: the Preliminary Project of Engineer Arvedo Arvedi from 1905 (Arvedi, 1905). Like a literary trace, the document has allowed the identification of a selection of "territorial objects" that are part of the historical fabric of the territory and which Eugenio Turri defines as "indelible data, incorporated into the territorial fabric" (Turri, 2002). The "mental" journey, a condition of a hermeneutic activity, sees the Mantova Peschiera route divided into four parts, where each is introduced by a section of the map corresponding to the concerned stretch, alongside an excerpt from the corresponding Technical Project Report. The documents are then accompanied by a series of zenithal photographs taken in the summer of 2019 with the help of a drone, on which the disappeared route has been redrawn in the form of a dashed line or double continuous line. The images are taken from a height of 70m and provide a snapshot of what remains of the route described by Engineer Arvedi, which has been given a geographical reference in the cartographic productions. Along the routes, it was then chosen to "dwell" on themes taken and deduced from the representation of the early twentieth century as emerging or cited in the project report: the system of suburban villas north of Mantova, the countryside between Marmirolo and Salionze, the Visconteo Bridge of Valeggio, and the complex of Austrian forts around Peschiera. Places described by connoisseurs such as photographers and historians who have produced precious documents made of memories that in the research are evoked in the form of text, capable of returning a subjective reality through architecture and whose documents have been consulted and selected here. Furthermore, a map has been produced to which the Railway Panorama of the Mincio Valley is connected, which, in the form of a collage, creates in elevation the metonymic profile of the identified microgeographies in which the dimension of railway travel returns and which, as defined by Marc Desportes "forges a new gaze that we could define as panoramic and whose understanding imposes as a reference contemporary forms of expression, such as photography, painting, ..." (2008, p. 85).

5. Conclusion

This research has unveiled the multifaceted relationship between railways and their surrounding landscapes, emphasising the physical and narrative connections they forge. Through the lens of the Mantova-Peschiera branch line, this study has sought to capture the essence of railway travel and its enduring impact on collective imaginery and identity.

The necessity of a detailed examination of such a minor element of the railway network is underscored by the ambition to envision its regeneration. The underlying thesis of this paper is to explain the architectural significance of these lines further, advocating for their conservation and preserving their *Infrastruttura* and *Soprastruttura* with its *Opere d'Arte*.

The research underscores the economic constraints that have historically shaped their development by recognising the unique character of the Mantova-Peschiera railway and its counterparts. These constraints have necessitated the ingenious use of local resources and afforded specific creativity in designing the elements of the railway infrastructure.

This study has been enriched by the historical and technical insights assembled from archival documents, which simplified the reconstruction of the railway's history. The contributions of railway manuals, particularly those by Engineer Stanislao Fadda, have been instrumental in this endeavour.

As railways evolve, the passenger's experience remains unchanged as a spectator of the shifting landscape. This constant is a thread that runs through the narrative of railway travel, from its inception to the age of high-speed trains and beyond, the realm of futuristic concepts like the Hyperloop.

The paper delves into juxtaposing the tangible railway infrastructure with the elusive panoramas glimpsed from train windows, mapping an interlaced journey from Mantova to Peschiera. It is a journey that reconstructs a subjective reality, informed by cultural memory and the relics of the land's history, where architecture stands as a testament to a shared heritage.

These narratives, inspired by diverse perspectives, contribute to a methodology that narrates places' physical and lived experiences. In the case of the Mantova-Peschiera, they present the line as a palimpsest, where the territory becomes a text layered with meaning and ripe for interpretation.

Figure 5. Federico Marcolini: the stop of Salionze alongside the Mantova-Peschiera railway, 2019.

In sum, the journey along the Mantova-Peschiera railway is an invitation to rediscover and reimagine the valley's landscapes. This hermeneutic exploration stitches together historical documents and the enduring marks upon the land. It proposes a re-engagement with these 'archaeological' traces, envisioning a future where the historical significance of railways is celebrated and integrated into the contemporary fabric of the territory.

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'Gesture' as a Subject of Doctoral Research in Architecture: Evidence-based Intuitions on a Complex Relationship

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References to the notion of 'gesture' within the context of Architecture lie ubiquitous in the discourse and practice of the discipline. This does not mean that one should take this connection for granted. In fact, the critical overview of an extremely diverse body of evidence, collected for the purpose of the author's doctoral research, challenges one's thesis with the burden of defining both the subject and the field of inquiry at the same time. Thankfully, this very overview also shows objectively that 'gesture', seen broadly either in terms of narrative or literal embodied action, tends to act as an autonomous entity in and of itself, evading the prescriptive definitions that stem from narrow conceptual or epistemological frameworks, and positioning itself instead in a more universal functional role as a generator of 'architectural' value.
On the other hand, the persistent dialectic relationship between 'gesture' and 'Architecture' shows that both entities can be seen as entangled, formulating a unified field of research as they oscillate between a virtual state and an actualized one: the one can inform our perception of the other and vice-versa, within the premises of an open bet that creates meaningful content for discourse once it reaches an outcome. Through this functionalistic scope of view, one can conceive of an "architectural gesture", equally as an "Architecture of gesture", in the terms of a self-sustained field of research that takes advantage of the synthetic nature of reality, instead of relying on borrowed epistemological abstractions for its legitimization. Within this context, Architecture is shown as an exemplary field of reference for the study of 'gesture' at the level of doctoral research, as it provides for grounded insights from a standpoint that affords one with genuine opportunity to create an original contribution to knowledge.

1. Introduction

This paper is reflecting this author's PhD research, which was completed and defended successfully in December 2022 at the National Technical University of Athens, School of Architecture, in Greece.[1] Arguably, it was 'not a normal PhD',[2] as it addressed a subject that was very hard to pinpoint in a structured and epistemologically concrete manner, especially since the academic framework of Architecture itself either relies heavily on borrowed epistemolo-

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1 Psilopoulos, 2022

2 As noted in public by the viva examination committee; personal recollection.

gies to substantiate its claims, or falls into the category of what Groat & Wang refer to conveniently as "Logical Argumentation".[3] It also took this researcher 22 years to finish (!), which is by no means a normal timeframe to do one's doctoral thesis.

The project came off from a genuine question: while the notion of 'gesture'[4] lies ubiquitous in the discourse of Architecture, studies around it are revealed to be fairly diverse in context and rather shifting from what we'd normally expect as premises for Architectural Theory. In fact, although the term does tend to be used rather freely in various architectural descriptions,[5] research about it usually borrows its conceptual and methodological framework, as well as its scope of interest, from fields external to the discipline; such as Cognitive Research, Anthropology and Social Studies, History and Historiography, or Philosophy. This does not lay far from a behavior most familiar to Architecture,[6] but it still leaves an urgent question waiting to be answered: if these approaches describe a 'gestural' entity that is structured exclusively within their own conceptual and /or philosophical frameworks, are we still referring to an idea of 'gesture' that is universally understandable, or are we actually referring to *different* entities that lay claim to the term 'gesture' legitimately, albeit in different terms? Oddly enough, empirical evidence or scholarly publications alike have shown that scientists, scholars, or even plain practitioners, present themselves confident about knowing 'what gesture is'—but arguably without really taking into consideration ideas or conceptual formulations from a point of view that is exterior to their own argumentative premises.

2. 'Gesture' as a subject of research in Architecture

This combination of blind certainty and fundamental disregard about external viewpoints on the same (?) subject created the main drive of this author to pursue a PhD on the topic. Following the meticulous collection of evidence that connected 'gesture' to arguments relative to the field and practice of Architecture beyond reasonable doubt, the question that rose ultimately was whether there was indeed *a meaningful hidden matrix*[7] laying behind all these scattered instances, that informed and engulfed them into a meta-level survey; and, if so, whether we could we speak of it as a single overarching entity in its own right.[8] This idea made sense, not only from an empirical standpoint (i.e. that it really doesn't make sense to discuss a manifest reality of the field from within a conceptual and epistemological *in vitro*),[9] but also because we found consistent evidence that 'gesture' tends to evade deterministic ontological classifications and prescriptive behavioral modelling, acting more akin to a 'black box' which only yields meaningful results after the event that makes them meaningful is actualized.[10] In the end, our 22 years' worth of research showed that gesture can be studied as a factorial entity that exists in a virtual state, where the product of Architecture is yet to be materialized, and an actual state all the same, where the 'gesture' of architecture takes part in a discourse that develops around an actualized end result.[11]

Quite fittingly, Architecture itself can also be shown to be a non-deterministic field of research that oscillates between theory, practice, and historical evidence, as well as between grounded arguments and intuition—namely, an actual state and a virtual state.[12] In analogy with gesture, it also appears consistently throughout history to establish itself upon fundamental questions on human condition and

3 Groat & Wang, 2013: chap. 1,11; While not directly referring to Groat & Wang, Friedman describes a similar framework in the context of Design Studies. 2003: 512–513

4 The reader should note that 'gesture' will henceforth appear either in single quotations to indicate it as an abstract notion, or without, to indicate that it is taken in its actual lexical meaning.

5 See, e.g., "(...) in the controlled gesturality of Garces and Soria (...)" de Solà-Morales, 1997, p. 114; also see: Megson, 2017; Owens, 2011; Slessor, 1995

6 See, e.g., Cuff, 2012; Plowright, 2014; Verschaffel, 2012; similar evidence can be found in Kostof (ed.) (2000); see also: Ballantyne, 2005; Fisher, 2015; Harries, 1987; Harries et al., 2018

7 That is, besides a mere cognitive linguistics association between embodied practice and architectural ideas that falls into the category of metaphorical language. See: Johnson, 2010; Lakoff & Johnson, 2003; for a collective overview of arguments around the same theme see, e.g., Gibbs, 2008; with specific regard to gesture see, e.g., Cienki & Müller, 2008; the same idea is found to play a role in the design process; see, e.g., Casakin, 2007; also: Cila, 2013; Coyne et al., 1994, etc.

8 See Psilopoulos, 2014; cf. Ritzer, n.d.; Tennis, 2008

9 Such concerns have been manifest in the recent history of architectural epistemology (or, at least, attempts to define one); see, e.g. the Portsmouth Design Methods in Architecture Symposium of 1967. Vardouli, 2014

10 E.g., Herold & Stahovich fail to achieve a direct predictive alignment between gesture and an actual reference object, unless the object itself is already concretely defined and materialized; see 2011: 252; this proably explains also how Magalhães & Pombo fail to create a syntactic association between gestural form and the content it creates in architectural sketches. 2013; On the opposite side, Murphy shows that gestural activity lies in direct relationtship with co-temporal formulations and externalizations of thought: 2003; 2004; 2005; 2012; the temporal aspect of this argument is addressed philosophically in a most fascinating manner in Verschaffel, 2001, pp. 19–21

11 E.g., such as the dispute around the « geste architectural » of the Centre Beaubourg in Paris, France, now known as Centre Georges Pompidou. See Psilopoulos, 2022: chap. 5.3; cf. 2018. This is where historical research usually comes into play.

12 See Verschaffel, 2012; cf. Cuff, 2012; see also: 1991; Kostof (ed.) (2000); Plowright, 2014

the construction of meaning;[13] spanning from Vitruvius' *Ten books on Architecture* "(...) as the promulgator of canonical rules and paradigmatic form",[14] all the way to Architecture's claim towards autonomous expression and artistic merit,[15] or genius and authenticity.[16] With regard to 'gesture', the Modern era—as it evolves from the exaltation of the *avant-garde* onwards—stays consistent to the theme as a means of externalizing architectural meaning, as it does not negate the rhetorical quality of Architecture (or, at least, the exploitation of that potential by several theorists and practitioners in the discipline),[17] nor does it stray from the perpetual questioning and critical restructuring of fundamental meanings to satisfy its existential agony.[18] Similarly, per Manfredo Tafuri's critique, 'gesture' can be seen arguably as a meaningful legitimizing factor for his "timeless, a-historical Gallery of Famous Buildings",[19] as it has been found to stand often for a self-sustained 'feat' of Architecture.[20]

This problem of legitimization ultimately becomes really important if one means to outline Architecture as a reference field for their research on 'gesture'. Indeed, the enormous variety of theoretical approaches born out of contemporary architectural practice demonstrate that, far from a universal theory of pluralism, what is considered valid these days depends largely on one's frame of reference and their own special interests.[21] To that end, Daniel Charles argues that the only certain universal condition is indeed 'this inescapable necessity', which is inscribed in the very *name* of Architecture:

> Architecture comes from the Greek archè, the beginning, the commandment, or the principle, and tektonikos, the carpenter or builder; and, as it happens often, the conjunction of the two words inflects the meaning of each to give rise to an unexpected overall meaning: archè makes "tecture" more than just a building.[22]

An 'archè' is not building *per se*, it is always a supplement that turns tectonics into Architecture. Oddly enough (or, maybe not?), here we find a most enticing reference to gesture mirroring the idea, through the words of Ludwig Wittgenstein:

> Architecture is a gesture. Not every purposive movement of the human body is a gesture. Just as little as every functional building is architecture. (MS 126 15r: 28.10.1942) [23]

In principle, Wittgenstein's aphorism[24] evokes the essential nature of Architecture by connecting it to the essential nature of gesture. Structurally, the phrase works through its distinctive function: it proposes to show us what architecture is, by telling us what it is *not*. There are several other implications to this quotation, especially within the context of the essentialist aesthetics of the era, as well as Wittgenstein's own personal involvement with Architecture for the purpose of designing his sister's *Palais Stonborough* in Vienna, of which several ideas seem to show up on the way towards his *Philosophical Investigations*.[25] And yet, we cannot escape the fact that gesture assumes here the role of a legitimizing 'Archè', one that we can see repeatedly on several occasions once we interpret all these 'gestural' characterizations we find widespread on architectural discourse[26] for their normative function.

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13 Throughout history, gesture has been treated as a carrier of fundamental—or, elemental—meaning, ever since the original treatises of Quintillian or, centuries later, Bulwer. See: 2001; 1644; cf. Kendon, 2004, 2007, 2013

14 Which is founded on the archetypical idea of the 'natural state' of man within their physical environment. Palladio, 2002; Rowland, 1999, p. 15; Serlio, 1996; the same idea also applies later on Perrault, 1993 etc.

15 E.g., such as the ones introduced by the Revolutionary 'Architecture Parlante' of Ledoux, Boullée, and Lequeu. See, most prominently, Ledoux, 1804; cf. Baridon, 2019; Groult, 1999; Kaufmann, 1943, 1952; Molok, 1996; Vidler, 2002, 2006; see also: Verschaffel, 2012

16 Choay & Guiraud, n.d.; McMahon, 2013; Middleton, 1992; Picon, n.d.; Taylor & Levine, 2019; Wittkower, 1973

17 J. Macarthur & Stead, 2012, pp. 126–128

18 See, e.g., Habermas & Ben-Habib, 1981; cf. Childs, 2008, p. 18; Jordán, 2020; Spiridonidis & Vogiatzaki also touch on this issue. 2020

19 (...) that "deduces its meaning and value from its very place there"; see Verschaffel, 2012, p. 168; cf. de Sola-Morales, 2000; Leach, 2007; for evidence of such an understanding of 'gesture'see, e.g., Moravánszky, 2007

20 Collard, 1998; Looseley, 1997; cf. Pula & Perna, 2023

21 (...) that range from 'subjective' phenomenological approaches to 'objective' structural approaches, and carrying examples that are grounded in normative principles as diverse as as ecology, algorithms, digital technologies and computers, commodification and media, neoclassicism, regionalism, new investigations into historicism and neo-humanist ideas, technologisism, materialism and tectonics, and even the current trail of generative AI assisted architectural composition. See Fisher, 2015: para. 16, with a few additions of our own.

22 Charles, n.d.: para. 3; our translation from the original French.

23 Wittgenstein, 1998a, p. 49

24 For it is nothing but an aphorism if we take it at face value, given that the phrase exists simply as a notation in Wittgenstein's notebooks rather than taking part in a structured argument. Some notable attempts were made to connect this argument to a broader theory, out of which we consider Verschaffel's critical essay as one of the more structured. 2001; cf. Psilopoulos, 2013a, 2013b

25 The theme is discussed extensively on this author's doctoral thesis, but there is hardly any room to go over it here. See Psilopoulos, 2022: chap. 1.1, 1.3; For Wittgenstein's involvement with architecture see Leitner, 2000; cf. Engelmann & Wittgenstein, 1967; see also: D. Macarthur, 2014; Paden, 2007; Topp, 2004; for the philosophical arguments that stem from this involvement see Wittgenstein, 1994, 1998b; 1998c

26 Cf. note 5, above.

Figure 1. Palais Stonborough, Vienna (1928); L. Wittgenstein και P. Engelmann, architects. Source: Leitner, 2000, p. 57

Charles argues further that this is a necessary condition for transcending the mythic element of the cosmos and creating a world that carries semantic weight. As he says, once given an order of origin, "the world is ready to be seen (...) [as] theory: a spectacle".[27] This creates a homogeneous space—Charles uses the term 'Agora'—which is by definition available to all who participate in the activity of seeing it and acknowledging it.

> The Archè, as "beginning and authority devoid distance", offers a fixed point of reference around which space, as a field of relations, consists in a grid of images that refer to an archetypal "to make visible" (theory, history). Thus, a unification of knowledge is achieved; a coherence: an isonomy. Architecture can be seen therefore as "a unity of isonomic relations, offered to display (as a spectacle, as a representation), and in which we are offered to see, immanent, an efficiency without the separation of an origin" (D. Payot). We are far from the "simple house" we originally assumed: the Archè satisfies this order, through a display and a spectacle (appearances), and an imputable origin—that is, as a triple complement [of the word tectonics].[28]

It is therefore conceivable to develop a valid and academically grounded inquiry around an 'Architecture of Gesture', provided that we can find sufficient amount of evidence to spur such a discourse. Thankfully, the world is rich of such tokens; it's just that people will most often take them for granted and rather build further arguments upon them, instead of questioning their fundamental relationship with Architecture first.

3. 'Gesture' as a legitimizing factor in Architecture

As it so happens, the problem in developing a doctoral thesis is that it needs to be backed by credible evidence that validate the question at hand. While this requirement felt incredibly daunting at first, it ultimately proved beneficial to our survey. Indeed, out of a plethora of references to 'gesture' within the context of architectural discourse, very few select paradigmatic cases fulfilled the criteria we set for the purposes of clarity, within our methodological framework:[29] This necessary distillment of evidence proved fortunate, as it revealed 'gesture'—consistently and beyond reasonable doubt—as a point of origin towards the creation of a certain value that is attached to instances of Architecture.

As we discussed earlier, tokens of this sort were found in extremely diverse fields. Each in their own right, created a universe of notions and ideas that arguably established the question of a relationship between 'gesture' and Architecture in vivid, albeit manifestly different colors. For the purposes of classification, this evidence was distinguished between those that refer to a discourse that develops within the actual process of design, namely *before* the actualization of the end product of Architecture, and those who refer to a discourse that develops *after* the actualization of that product, usually within the context of a narrative that extends to the point of a metaphysical quality or myth.[30] Even so, 'gesture' was constantly found to act as a token of validity, be it in terms of functional creativity—e.g., in the case of face-to-face collaboration in design meetings and gestural imprints on architectural sketches—or narrative interpretations on the themes of 'genuineness', 'originality', 'exercise of power' or 'aesthetic affect'.[31] Not only so, but it also looked *persistently* to evade fixed prescriptions and translations, as if it were, in and of itself, the source of value, born out of some sort of mystical or elemental condition that supports the creation of meaning. As a result, our critical interpretation of our findings created an evident difference between the notion of "theme", used to describe the function of 'gesture' within a specific context, and the notion of "value", which was used to describe a persisting

27 Charles, n.d.: para. 4; as per note 20, above.

28 Op. cit.; cf. Payot, 1982. It should be noted that both 'geste' (in French) and 'chironomia' (in Greek) share the idea of 'nomos', a principle that is used to create proper order (see, e.g., in the French word 'gestion').

29 Namely, a] to carry content that creates a valid object of study within the premises of our stated research question, on the provision we take it at face value, without having to resort to liberal interpretations in order to create meaningful arguments; and b) to showcase an exemplary relationship between Architecture and 'gesture' that is constituted within an identifiable field, or that exists within an adequately self-sustained body of knowledge, which is capable to explain this relationship within its own boundaries. Psilopoulos, 2022, pp. 30–41 ('General Introduction to the Subject of the Thesis', sec. ii)

30 For the first part see Le Corbusier, 1955; for the second part, see in relation Wogenscky, 2006

31 Psilopoulos, 2022: chaps 2–5; this reflects the main body of the dissertation. A final chapter is also offered, that examines the mechanism upon which such an entity may be outlined ontologically—see chap. 6

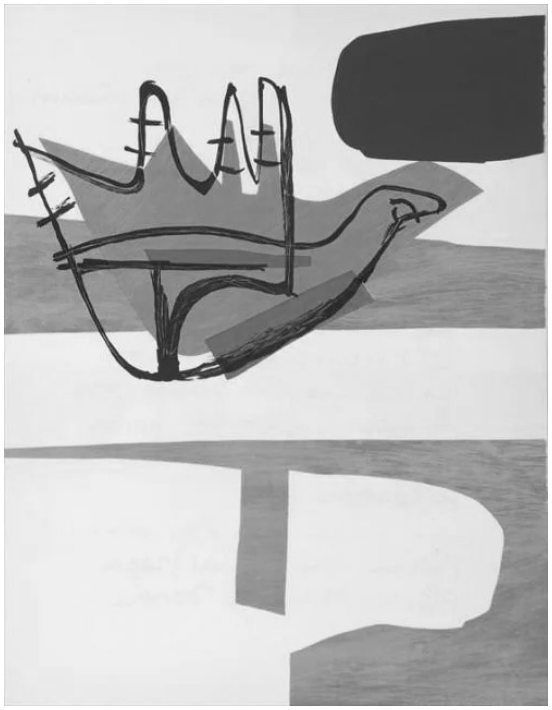

Figure 2: PlaceholderFigure 2. « (...) Pleine main j'ai reçu / Pleine main je donne ». Excerpt from the poem «Offre» by Le Corbusier. Accompanying lithograph on the opposite page (shown above), also by Le Corbusier.1955:144-5

mechanics where 'gesture' is shown as important for the creation of meaning in Architecture.

The premises of contraposition between those two classifiers, eventually solved for this author the mystery why architect and academic Federico Soriano chooses to explain 'gesture' to the reader of the *Metapolis Dictionary of Advanced Architecture* by referring directly, and without any other contribution of his own, to an excerpt from a lecture Federico Garcia Lorca gave in 1928 on poetry:

> The imagination of men has created giants to attribute the construction of great caverns and enchanted cities. Reality has later shown that these great caverns were really made by a drop of water. By the pure drop of water, patient, and eternal. In this case, as in so many others, reality wins. More beautiful is the instinct of the drop of water than the hand of the giant. The real truth beats the imagination in poetry, that is, imagination itself discovers its poverty. Imagination logically attributed to giants what seemed like the work of giants; but scientific reality, poetic to the extreme and outside of logic, puts truth in the clean, perennial drop of water.
>
> Because it is more beautiful that a cave is the mysterious whim of water, linked and ordered by eternal laws, than the whim of giants that have no more reason than imagination.[32]

Same as with a doctoral thesis, the reader needs to do some work in order to decipher Soriano's argument; the text itself does not provide for normative descriptions, as one would expect to find in a Dictionary entry.[33] The title of Lorca's lecture is "Imaginación, Inspiración, Evasión", which manifestly translates to "Imagination, Inspiration, Evasion". In his argument, Lorca presents the poets' resort to imagination as an evasion from the true poetic nature of reality. Imagination draws from reasoning; therefore, it is delimited by one person's capacity for theorizing within a certain context. Ultimately, this becomes a feeble attempt to bring reality down to one's own measure; to impose human order onto the true nature of the world, to make it manageable. Of course, nature—in this case—stays agnostic to this very human reaction of fear against what's inconceivable. But, at the same time, it also remains laid bare before our eyes, to see and grasp for its own merit. Reality, in its purest form, is shown to be more poetic than a poet's imagination; therefore, the poet is invited to rid themselves from fear and draw inspiration from what's truly beautiful.[34] If we take Soriano's entry at face value, 'gesture', within the context of Architecture, is like that.

4. Conclusion

The concept of 'gesture' seems to occupy a particular position in the discourse of Architecture as an idea that serves to validate the 'truth' of an architectural work, while also maintaining its position as an inescapable embodied practice that manifests during its production. This notion has been examined in this author's doctoral thesis both in terms of an actual aspect of cognitive action that architects exhibit during the design process, as well as a constitutional narrative that relates to the finished product of architecture.

If we were to examine, however, 'gesture' as a singular entity in the context of these instances alone, it would create an unmanageably diverse field of study with a suffering epistemological clarity. At the same time, it simply does not make sense to claim that all of these instances substantiate ontologically different entities of 'gesture', especially since all of these manifestations consistently tend to reveal shared traits and functional mechanics, including a most evident disregard for normative or prescriptive definitions. This suggests the potential of 'gesture' to be considered, in and of itself, as an autonomous entity.

32 This is Soriano's translation, as it appears in Soriano, 2003; for the original text see Laffranque, 1953, pp. 334–335

33 Such attempts that venture to offer a 'dictionary' definition of 'gesture' in the context of Archietcture are offered by Gänshirt, 2007; Porter, 2004

34 Anderson, 1991

For the purposes of this paper, we attempted to show 'gesture' as a legitimizing factor in the discourse of architecture, especially with regard to an elemental quality that we generally found attached to it, either on its own or within the context of Architecture. Furthermore, once we consider that Architecture itself makes for a variable framework of reference, same way as 'gesture' concretizes itself upon the circumstances and context of its manifestation, we proposed it could be argued that not only 'gesture' can be thought of as an archetypical entity within the field of Architecture but also that Architecture can be conceived of and discussed in terms of 'gesture', very much like a *recto-verso* understanding of the two entangled entities. Such being the case, the benefit of doing research on 'gesture' upon these terms would very much inform our understanding of Architecture in general, as the same would also apply vice-versa.

To this point, we maintain that Architecture can serve as an exemplary field of reference, given that its practice and documentation can fluctuate most freely between cognitive action and narrative, physical tokens, and ideas. Within these premises, it makes sense to argue that theoretical research on 'gesture' with regard to its relation to architecture—in our case at a doctoral thesis level—not only creates a genuine and original contribution to knowledge, but also informs our understanding of architectural discourse on the subject at a most fundamental level.

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