

# Representation as Mental Projections: De/Re-constructing Casa della Falsità through Sequential Transformations

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**Abstract.** This study investigates architectural representation as a dynamic “mental projection” exploring where geometric logic and conceptual thought intersect. The central research question asks: How can the intuitive, often unpredictable processes behind complex architectural transformations be systematically decoded? Focusing on the “Casa della Falsità” project, the research analyses speculative interventions by five architects, including Alessandro Mendini, Peter Wilson, Haus Rucker Co, Andrea Branzi, and Zaha Hadid. The study employs a reverse-reading methodology, deconstructing these architectural drawings into sequential, rule-based phases. This analytical dissection reveals the critical tension between geometric projection, defined as formal and traceable operations, and mental projection, characterized by subjective and irreducible intent. The results demonstrate that while architects like Mendini adopt legible visual languages, others, such as Hadid, rely on abstraction that defies strict geometric rationalization. Consequently, this research positions representation as a vital epistemological tool. By listing these transformative operations, the study proposes a pedagogical framework for reading drawings as spatial narratives, repositioning the architectural representation as an active site of knowledge production.

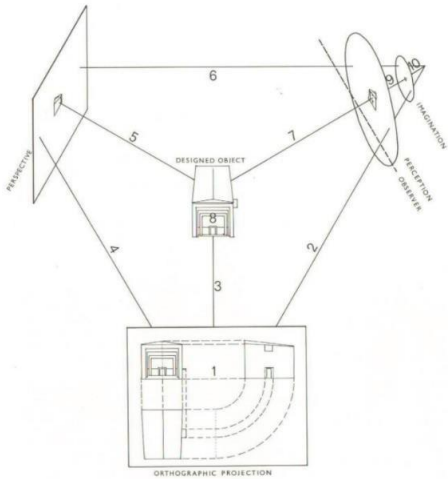
## 1 Introduction

This paper explores transformation as a representational process, positioning drawing and modelling as cognitive and generative acts through which architectural ideas are projected, negotiated, and reconstituted. Robin Evans argues that projection is a transitive operation [1]. It has no fixed starting point, can reverse, change direction, and circulate across different domains. In his “Projection and its analogies” diagram (Fig. 1), Evans maps the transitional relations between drawing, object, observer, and image. By doing so, he demonstrates that space is constructed both mentally and physically. Particularly in route (2), he explains that when ideas move from mind to page, the process involves both visual and motor activity; projective space is therefore inseparably bound to mobility and imagination. In routes (8),

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(9), and (10), he emphasizes that form is not fixed and that visual perception plays a crucial role.



**Fig. 1.** Projection and its analogies [1].

Alberto Pérez-Gómez cautions against reducing drawing to a neutral instrument of descriptive geometry, arguing instead that representation embodies symbolic and poetic intentionality, mediating between embodied experience and abstract order [2, 3]. Expanding on this discourse, Mario Carpo highlights how the digital turn has further destabilized the presumed transparency between drawing and building, shifting architectural authorship toward algorithmic and rule-based systems [4]. Within this theoretical framework, transformation can be understood as a projective negotiation between mental imagination, geometric structuring, and systemic reproducibility.

Rather than approaching transformation as a mere formal manipulation, this research interprets it as a sequential and rule-based operation that exposes the interplay between mental intent and geometric logic. By analysing representational transformations in the Casa della Falsità project, the study investigates how complexity and unpredictability emerge within iterative systems of reconstruction, and whether these systems can operate independently of subjectivity. Thus, the paper seeks to understand how rule-based transformations mediate between indeterminacy and control, and how varying degrees of transformation affect architectural meaning, reconstructability, and functionality.

### Research Questions:

- How can the complexity and (un)predictability of representational transformation processes be decoded or systematized?
- Can the final interpretation or any intermediate phase of a transformation be re-generated through rule-based methods, beyond the designer's subjective intention?
- What sequential steps or operations are required to formulate this unique final state of transformation?
- To what extent can these rules make the final representation reproducible while preserving its subjective character?
- Is there a correlation between the degree of transformation and the threshold at which a project becomes (un)buildable or (non)functional?
- What distinctions emerge between the transferability of material relations (geometry, tectonics, matter) and immaterial relations (concept, representation, intent) within rule-based transformation processes?

Grounded in these questions, this study unfolds as a sequential exploration of transformations, emphasizing that each final form represents a frozen moment within a continuous process of becoming. Drawing inspiration from Cubist artworks -where multiplicity and simultaneity are expressed through fragmented perspectives- and from M.C. Escher's mathematically structured visual transformations, the research examines how subjective representational series can be formalized through objective rule systems. In this context, Tschumi's *Manhattan Transcripts* provides a theoretical framework for reading architectural representation as a field of sequential operations, while Oliver Byrne's visual interpretation of Euclidean geometry offers a methodological model for articulating

transformation processes with sequential and rule-based system. Finally, through a series of experimental reconfigurations and layered mappings of the Casa della Falsità project, the study proposes the formulation of transformative rule sets that mediate between mental projection, geometric logic, and representational intent.

2 Sequential Deformations

As a temporal discontinuation of the dynamic process of becoming, each form serves as a frozen image of an ongoing journey [5].<sup>†</sup> The architectural form similarly represents a temporary crystallization of this process, translated into material reality through representation. Within this continuum, architectural drawing assumes a critical mediating role.

Although the drawing process consists of complexities itself, it should be emphasized that sketching, as an indispensable part of architectural drawing, transforms the drawing surface into a battleground where every trace is manifested. As Tipene notes, this transformative capacity of the sketch exposes the tension between order and uncertainty, turning the act of drawing into a confrontation with the unknown [6]. In parallel with this, Tepavcevic and Stojakovic state that rather than a representation of a single object, a drawing acts as a trace of the ongoing and evolving perspectival mutations [7].

It is assumed that the relationships between the in-between phases of forms/ representations (one frozen situation of a transformation), temporality (time, fluidity), gradual or dramatic transformations, movements in time, and superposition or separation of these different aspects during different times which is the similar idea behind the production of cubist paintings can be counted as the elements/methods to make a form non-configurable and unpredictable for sequential phases. To address this complexity, such processes can be analysed systematically. For example, Craig S. Kaplan's work entitled "Metamorphosis in Escher's Art" categorizes six modes of transition, M. C. Escher's artworks include crossfade, abutment, growth, and interpolation [8] (Fig. 2). Given these techniques, Kaplan envisions a "metamorphosis toolkit" for designers to benefit from these algorithmic transitions. Based

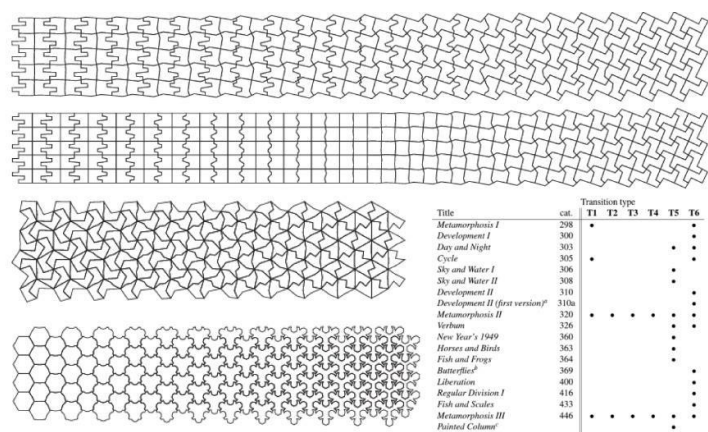


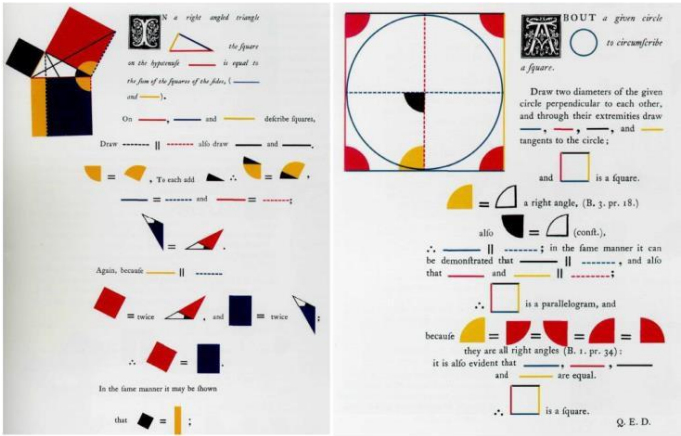
Fig. 2. Inspired by Escher's metamorphoses and transition types, Kaplan's isohedral tiling designs [8].

<sup>†</sup> Jede form ist das erst arrte moment bild eines prozesses. Also ist das werk haltestelle des werdens, und nicht erstarrtes ziel". Merz, no. 8/9 (Hannover, April/July 1924). Designed and edited by El Lissitzky and Kurt Schwitters. Retrieved from: <https://www.moma.org/slideshows/43/796>. Translation: "Every form is the frozen instantaneous picture of a process. Thus, a work of art is a stopping place on the road of becoming and not the fixed goal."

on these, this research explores how new geometric metamorphoses can be formulated and depicted.

Bernard Tschumi’s Manhattan Transcripts can be regarded as a research laboratory with characteristic vertical and horizontal sequences combined with set of internal rules to explore the potential of sequential transformations and make their operations legible. Each frame of transcripts follows another repetitively, additionally, disjunctionally, insertively, or fading. Framing manipulates the sequence, and by distorting, compressing, or displacing them through montage or editing techniques, they become unique representations. They are developed with subjective implementations with objective rules [9].

Mathematics teacher Oliver Byrne’s coloured diagrams can also assist in understanding sequencing and describing complex relations. Byrne deconstructs and redraws the elements of Euclid by using coloured diagrams and symbols combined with short texts (Fig. 3) [10]. Each geometrical element is named by specific shape, colour, and orientation. There are definitions starting from irreducible singularities to complexities such as points, lines, angles, segments, boundaries, surfaces, and relations between these elements. These elements are used in visualizing the instructions for drawing Euclidian Propositions, Postulates, and Axioms [11]. Therefore, the dense information becomes representable and communicable, in other words, describable for learners.



**Fig. 3.** Coloured diagrams of Oliver Byrne, in The First Six Books of the Elements of Euclid [10].

This paper aims to discuss the deformation process through the constraints and potentials of representation under these titles: Geometric differences between the fragments of sequential temporal phases, differences in spatial representation between increasing degrees of deformation, and the potential correlations between the degree of complexity and deformation. Despite the constraints of representing one static situation and belonging to one frozen time, representations have the power and potential to reshape reality by altering geometrical and topological relations without concrete reality.

3 Case Study: Casa della Falsità

Focus Furniture Gallery Building is a system of different relations itself. The transformed version of the gallery building as “Casa della Falsità” is also a complex system that adds new layers with new geometric relations and parameters to the existing system. Besides, each interpretation has its own varying degrees of complexity. Bar-Yam asserts that complexity is difficult to understand or analyse since it consists of interconnected or interwoven elements. Complexity is the information required to describe a system [12]. Points, lines, beings, and

relations construct a system by varied numbers and dispositions. A complex system can be described by the formation and distribution of lines, paths, stations, borders, edges, and forms. These systems have space for uncertainties, changes, and dynamism [13]. Representation as a field of transformations and operations has constraints and the potential to intervene in existing situations. Interventions on different types of representation, such as plan, section, and elevation, reveal varying geometrical relations and illustrate varying complex systems. This study aims to reveal the degree of complexity and the hidden geometries between the phases of these complexities.

This study seeks to systematically explain a transformation process with a case study of “Casa della Falsità” known as the “House of Lies and Illusions.” The idea behind this exhibition is to criticize the municipal constraints for changing the spatial organizations of Focus Furniture Gallery in Munich and transform it via representations. In response to constraints imposed by the municipality in 1982, the “Casa Della Falsità” exhibition took place in the existing gallery building, where 11 invited architects/groups transformed the building freely with their “unique” drawings [14].

Hagel, has categorised the drawings into five groups related with their theme or concept: ‘Matrix and Imagery’ (Alessandro Mendini and Robert Maria Steig), ‘Fantasy and Fantastic Gesture’ (Zaha M. Hadid and Stefan Wewerka), ‘The Classical as Quotation and Mannerism as Idea’ (Trix and Robert Hausmann and The Studio Alchymia), ‘Demonstration and Projection’ (Bruno Minardi and Andrea Branzi), and ‘Architecture as a Simple and Complex Message’ (The Haus-Rucker Co., Peter Wilson and The Opera Group) [15].

This research analyses and defines the transformation techniques of these professional architects’ drawings, which have their own style for reconfiguring the existing spatial relations through reverse-reading and rule-based segmentation.

## 4 Methodology: Reverse-Reading and Rule-Based Segmentation

*“Form matters, but not so much the forms of things as the forms between things.”*

Stan Allen [16]

This phase of the research focuses on revealing the hidden geometries embedded in architectural reinterpretations through reverse-reading and rule-based segmentation. It seeks to decode the internal logic of these reinterpretations by identifying sequential transformation rules between the existing state of the Focus Furniture Gallery and its interpreted versions. Each representation, developed by a different architect, embodies distinct layers of visual complexity and hidden geometric relations.

To systematically uncover these embedded geometries, the study establishes a multi-step methodology inspired by Oliver Byrne’s rule-based visual system. This method facilitates the verbal and visual articulation of transformations through geometric logic:

- **Dimensional Hierarchies:** Defining hierarchical relationships among elements by referencing them to one another based on size, position, or alignment.
- **Angular Relations:** Specifying angular values explicitly to articulate spatial shifts when orientation cannot be inferred directly from element alignment.
- **Sub-element Integration:** Integrating verbal rules with visual breakdowns to clarify the internal structures of complex, compound elements.
- **Grid-Based Referencing:** Utilizing scaled grid overlays to accurately locate reference points within intricate or indented (convex/concave) forms, particularly when precise measurements are elusive.

This approach enables a layered deconstruction of complex representational configurations, translating them into rule-based sequences that reveal both the representational logic and the speculative nature of architectural reinterpretation.

4.1 Alessandro Mendini

De Lucchi notes that for Mendini, the act of drawing was an exploration where the message mattered more than the final image. He believed that an elaborate drawing style was the best indicator of an artist’s representational authenticity [17]. Mendini prefers not to intervene in building structurally. Instead, he added a layer of cones placed at equal distances with an angular grid on the floor plan, roof plan, facade, and interior surfaces (Fig. 4-6). While segmenting the transition between the last phase of representation of the building and its initial state, drawing an angled grid to define the positions of the cones with equal distance, determining intersection points, proportional growth-shrink, and radial alignment to establish the perception of perspective in the interior were taken into consideration (See Table 1. Summary of the Casa della Falsità Transformative Rule Set | No.1).

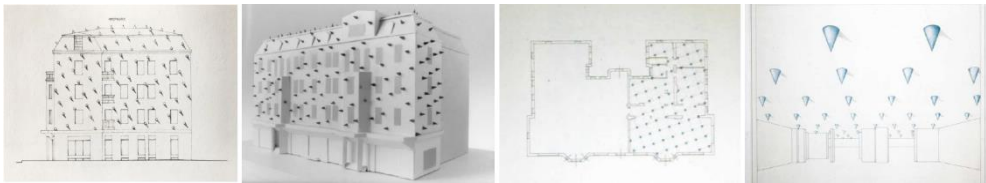


Fig. 4, 5, 6. Alessandro Mendini’s proposals for Casa della Falsità [18, 19].

Table 1. Summary of the Casa della Falsità Transformative Rule Set | No.1.

| Phases        | Transformative Rules                                                                                                                                                                                          |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Phase 0       | Initial state of the Focus Furniture Gallery building/ Casa della Falsità.                                                                                                                                    |
|               |                                                                                                                                                                                                               |
| Phase 1-2     | <b>Draw</b> a parallel line to the facade of the building with X distance. Mark a point at a distance of Y from the left end point of this parallel line.                                                     |
| Phase 3-4     | <b>Draw</b> a right triangle with this parallel line as its base and the marked point as its corner point.                                                                                                    |
| Phase 5 to +n | <b>Apply</b> recursive and abstract projections (Instruction 3 to n+1). These operations involve escalating geometric complexities that reconfigure the building’s essence into fragmented, non-linear forms. |
|               |                                                                                                                                                                                                               |

4.2 Peter Wilson

Peter Wilson’s architectural drawings operate as ‘hybrid and generative fields’ in which architectural form emerges not from descriptive resolution but from the ideogrammatic projection of thought, metaphor, and spatial imagination, resisting literal procedural translation [20]. Wilson transforms the facade through plan and elevation drawings, presenting an intriguing design proposal characterized by compositional complexity and the interruption of orthographic and oblique depictions that create illusions of depth (Fig. 7-10). Besides, he worked on planic arrangements by rotating the inner square salon, generating new spatial potentials like exploring niches or poches. Thus, Wilson awakened new meanings

for viewers [14]. Describing not only the hierarchically largest element of Wilson’s interpretation and its position but also the inner geometric relationships and sub-elements it encompasses has caused difficulties in formulating visual and written rule sets. Each sub-element increased the relationships with its surrounding elements and caused difficulties in choosing reference points to define them. Therefore, it can be said that the more relationships and sub-elements with hidden geometries, the more phases the rule set contains (See Table 2. Summary of the Casa della Falsità Transformative Rule Set | No.2).

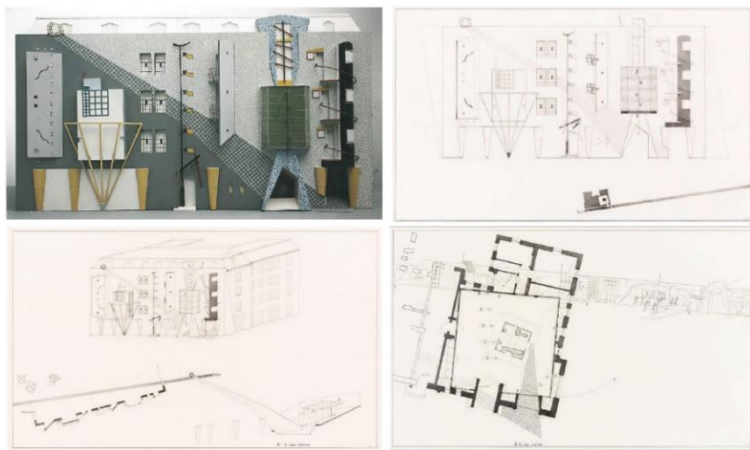
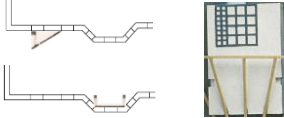
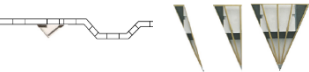


Fig. 7, 8, 9, 10. Peter Wilson’s proposals for Casa della Falsità [14].

Table 2. Summary of the Casa della Falsità Transformative Rule Set | No.2.

| Phases    | Transformative Rules                                                                                                                                                |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Phase 0   | Initial state of the Focus Furniture Gallery building/ Casa della Falsità.                                                                                          |
| Phase 1-2 | <b>Draw</b> right-angled triangles starting from the windows and extending outward. <b>Insert</b> rectangular bounding boxes into the structural bays.              |
|           |                                                                                  |
| Phase 3-4 | <b>Draw</b> secondary triangles from wall midpoints to sequential windows. <b>Define</b> secondary rectangles to explore interior niches and spatial voids.         |
|           |                                                                                  |
| Phase 5-7 | <b>Draw</b> quarters of an ellipse and symmetrically duplicate them over the established rectilinear frames.                                                        |
| Phase 8+n | <b>Apply</b> recursive rotational rules across the facade and plan. These operations create a layered, non-literal representation of the building's original logic. |
|           |                                                                                  |

4.3 Haus Rucker Co

Haus Rucker Co deforms the building mainly on section and creates contrast relations on plans and elevations (Fig. 11-13). Starting with dividing the reinterpreted plan into grids, it can be easier to see the rectangular elements inside. The more radical deformations can be read from the section and three-dimensional model. While architects reconfigure the topological relations on horizontal planes, it seems that different sizes of polygonal surfaces are added as vertical elements and positioned angularly. The grid is rotated 45 degrees, is positioned on the facade, and starts from the first floor ending line. Through the frames created by the grid and the contrast colouring, the relations can be read and described more easily (See Table 3. Summary of the Casa della Falsità Transformative Rule Set | No.3).

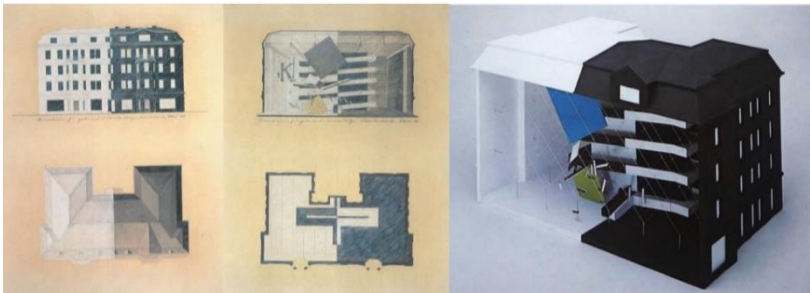
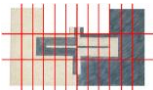
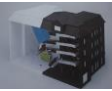


Fig. 11, 12, 13. Haus Rucker Co’s proposals for Casa della Falsità [14], [21].

Table 3. Summary of the Casa della Falsità Transformative Rule Set | No.3.

| Phases     | Transformative Rules                                                                                                                                                                                                                                        |
|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Phase 0    | Initial state of the Focus Furniture Gallery building/ Casa della Falsità.                                                                                                                                                                                  |
| Phase 1-2  | <b>Divide</b> the floor plan vertically into 2 equal parts. <b>Divide</b> the facade into 2 equal pieces.                                                                                                                                                   |
| Phase 3-4  | <b>Colour</b> the two pieces of the facade and their corresponding voids symmetrically as absolute black and white.                                                                                                                                         |
|            |                                                                                       |
| Phase 5-7  | <b>Keep</b> the external silhouette of the building. <b>Draw</b> a schematic section. <b>Divide</b> the two pieces of the building into 3 equal vertical sections.                                                                                          |
| Phase 8 +n | <b>Integrate</b> the fragmented components to create a stark, non-representational volume. The final result manifests as an absolute abstraction of the original architectural identity.                                                                    |
|            |    |

4.4 Andrea Branzi

Branzi's interpretation has layered transformations on plans and elevations. While the vertical elements cover the building's external surfaces, there is vegetation without verticals covering the gaps of the cladding. In addition, there are also curved walls on the floor plan (Fig. 14-17). Starting with drawing grids, which are tangent to the exterior lines of the building, helps to coordinate and define the vertical and curved elements with reference points by creating intersection points, edges, and surfaces. So, it can be said that segmentation is one of the key methods to describe this transformation process. However, the large-scale segmentation is not enough to describe the formation process of vegetation with convex and concave topology with irregular orientations. Fractal geometries or box-counting methods can be used to formulate this kind of complex and hard-to-measured relations more accurately and sensitively. As a result, it can be said that the more irregular and branched configurations in small-scale details, the more extensive and detailed phases the rule set requires (See Table 4. Summary of the Casa della Falsità Transformative Rule Set | No.4).

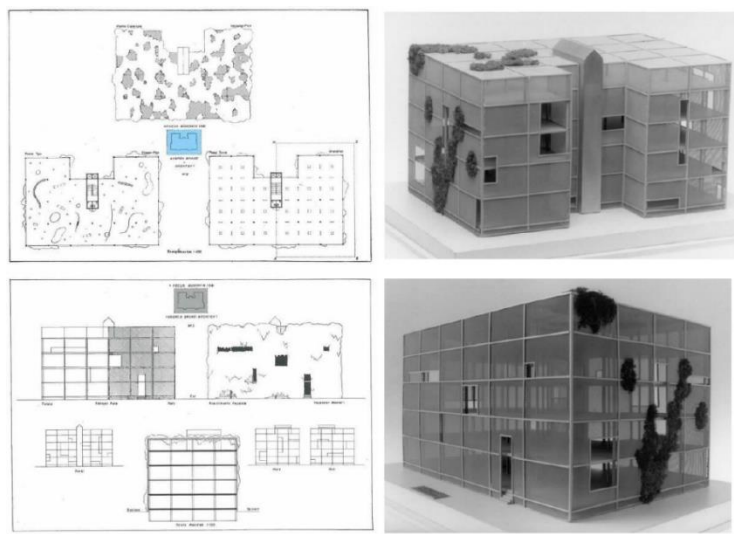
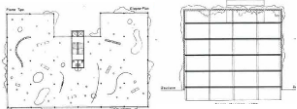
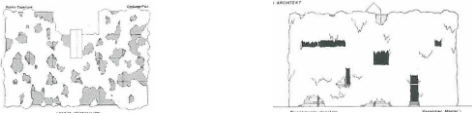


Fig. 14, 15, 16, 17. Andrea Branzi’s proposals for Casa della Falsità [14, 19].

Table 4. Summary of the Casa della Falsità Transformative Rule Set | No.4.

| Phases    | Transformative Rules                                                                                                                                                                                                                                                |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Phase 0   | Initial state of the Focus Furniture Gallery building/ Casa della Falsità.                                                                                                                                                                                          |
| Phase 1-2 | <b>Draw</b> a rectangle tangent to the exterior walls and the attic of the building on both plan and facade.                                                                                                                                                        |
| Phase 3-4 | <b>Divide</b> the rectangle horizontally into 4-5 equal rows and vertically into 4-6 equal columns. <b>Mark</b> the precise intersection points of the grid.                                                                                                        |
| Phase 5-7 | <b>Add</b> a rectangle to the top floor as an extension of the staircase (height = 1/2k). <b>Apply</b> fractal geometry (box-counting method) to define vegetation patterns.<br> |

|            |                                                                                                                                     |
|------------|-------------------------------------------------------------------------------------------------------------------------------------|
| Phase 8 +n | <b>Integrate</b> all elements to form a systematic, grid-based spatial reconfiguration where architectural and organic forms merge. |
|            |                                                    |

4.5 Zaha Hadid

Hadid’s proposal differs from the other examples examined in this research by adding so many layers that mask the original proportions and relations of the building (Fig. 18-20). These interventions almost make the existing Focus Furniture Gallery unrecognizable. Starting with covering the front facade completely with a tetragonal surface and the secondary facade partially with a folded polygonal surface, these surfaces anchored to the building act as a background for following transformations. Vertical, curved, and radial lines can be read from the plan and axonometric drawings. It can be challenging to measure the curving, folding, or intersecting degree by drawing grids like in previous examples since this interpretation has its own irregularity, such as an increased degree of complexity. So, the rule set is continued by combining the verbal instructions with the aid of singular visual geometric elements. The rule set can be constructed easily after finding reference points to relate one element with another. Hadid’s interpretation has a wide range of anti-gravitational geometrical elements, lines to surfaces, surfaces to three-dimensional topologies, while the projection of these elements across different representational planes changes irregularly. As a result, it can be said that reproducing this unique transformation needs many additional phases (See Table 5. Summary of the Casa della Falsità Transformative Rule Set | No.5).

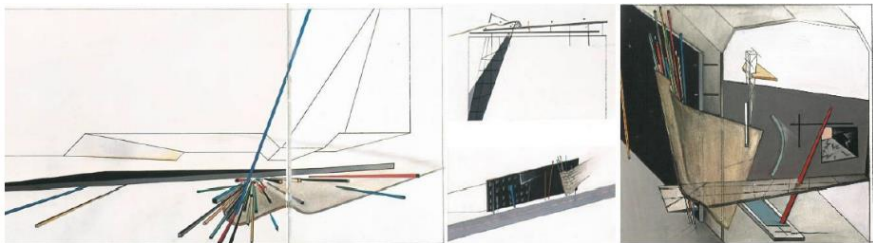
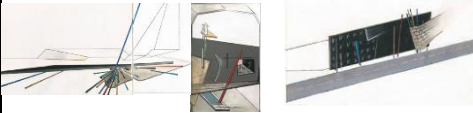


Fig. 18, 19, 20. Zaha Hadid’s proposals for Casa della Falsità [14].

Table 5. Summary of the Casa della Falsità Transformative Rule Set | No.5.

| Phases    | Transformative Rules                                                                                                                                                                 |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Phase 0   | Initial state of the building.                                                                                                                                                       |
| Phase 1-2 | <b>Cover</b> the front facade with a tetragonal surface and the secondary facade with a folded polygonal surface to establish a background for subsequent transformations.           |
| Phase 3-4 | <b>Establish</b> reference points to relate geometric elements.                                                                                                                      |
| Phase 5-7 | <b>Introduce</b> vertical, curved, and radial lines. <b>Deploy</b> anti-gravitational elements ranging from lines to 3D topologies, allowing for irregular projections across planes |

|          |                                                                                                                                                                               |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Phase +n | <b>Execute</b> multiple additional phases of recursive, non-linear transformations. These layers mask original proportions, resulting in an unrecognizable final composition. |
|          |                                                                                              |

4.6 Evaluation: From Rule Sets to a Transformation Toolkit

Inspired by Stan Allen [16], it is observed that field condition is a way to make architecture “inherently expandable” by creating open frameworks that can change from the bottom up. These rule-set examinations reveal several techniques that can be identified as a transformation toolkit for transforming the relations that construct the architectural form. It also shows how expandable this process is through segmentations, deconstruction, reconstruction, multiplication, changing the positions/angles/orientations of the elements, and creating/combining new relations with each other.

5 Conclusion

This research unfolds the deformation process by formulating a set of transformative operations/rules by rereading the two-dimensional and three-dimensional representations of Casa della Falsità as resource material created by five architects/groups in 1982. These five exercises unveil common and different methods for layering and separating this process step by step. When the rule sets are read from bottom-up (phase 0: representation of existing building, initial state to phase n: representation of deformed/transformed building), several inferences emerge, such as the multiple ways of form generation, the dynamic relations among the elements, the uniqueness/unpredictability of final form with respect to the chosen relational route. When the rule sets are read from top to bottom (phase n to phase 0), the difficulty of establishing transition layers between the final state and the initial state becomes obvious. The long chain of the phases shows not only the complexity level by revealing the hidden geometric and topological transformations but also the difficulty level of replicating the exact representation of the building without its designer. This research is an exemplification of infinite variations arising from the same resource.

5.1 Potential Contributions

While the primary aim of the study is to develop an analytical method for understanding architectural representations as mental and geometric projections, the methodology proposed here may also carry implications for design pedagogy. By translating mental projections into traceable, rule-based visual sequences, the process can offer tools to teach spatial reasoning, conceptual clarity, and the interrelation between intuitive thought and geometric articulation. This layered reading of drawings could support pedagogical approaches that encourage students to engage with representations not merely as static, but as structured expressions of architectural thinking.

## 5.2 Further Research: Increasing deformation degrees, complexity, and unpredictability

Stan Allen, in his book "Points+Lines," shows the transmissions between different scales, extending from the diagrammatic construction of a city to the diagrammatic construction of a surface [22]. The strength of these examples lies in how the essential information of a "whole" is maintained as tangible manifestations of reversibility between informational phases. Based on these, this study leaves the following questions for further research: After adding increasing and varying degrees of geometrical relations, to what extent does the last phase of the interpreted building transfer the current state of the gallery building? How effective is it to use complex geometries in different scales in a building, such as turning into a building cladding element or structural material? Is there any correlation between increasing degrees of (spatial) complexity and (spatial) functionality?

## Acknowledgements

This paper emerged from research developed within the scope of the course "Geometry in Architectural Design" in the Architectural Design Doctoral Program at Istanbul Technical University, tutored by Assoc. Prof. Dr. Sema Alaçam during the 2023–2024 Fall Semester. The manuscript has been revised and expanded for this symposium. As a student enrolled in this course, the author would like to thank Assoc. Prof. Dr. Sema Alaçam and the course participants for the discussions that supported the development of this research.

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