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AVANT-GARDE IN THE AGE OF AI? INTELLECTUAL AND EMOTIONAL PREMISES OF CONTINUITY

AWANGARDA W DOBIE SI? INTELEKTUALNE I EMOCJONALNE PRZESŁANKI CIĄGŁOŚCI

Abstract

This article examines contemporary trends in architecture and culture through the lens of traditional historical paradigms. It focuses on the evolving systems of aesthetic evaluation and shifts in the mental frameworks of both creators and audiences, driven by the digitalization of the environment and the proliferation of next-generation media. The study analyzes methods for verifying aesthetic judgments and explores the changing criteria used to assess stylistic expression in artistic practices. Particular attention is given to the impact of large language models and artificial intelligence on expert assessments and the broader implications for cultural identity.

Keywords: tradition, style, artificial intelligence, digital media

Streszczenie

Artykuł przedstawia analizę współczesnych tendencji w architekturze i kulturze na tle tradycyjnego pojmowania historycznych rodowodów. Głównym wątkiem rozważań jest zmiana, jaka dokonuje się w systemach oceny, a także w indywidualnych odczuciach twórców i odbiorców pod wpływem cyfryzacji środowiska i ekspansji mediów nowej generacji. Badaniu poddano metody, jakimi weryfikowane są osądy estetyczne oraz kryteria oceny stylu wypowiedzi artystycznej. Zasygnalizowano również wpływ rozwoju dużych modeli językowych i sztucznej inteligencji na opinie eksperckie oraz poczucie tożsamości kulturowej.

Słowa kluczowe: tradycja, styl, sztuczna inteligencja, media cyfrowe

1. INTRODUCTION

The evolution of Western architecture has long been grounded in a tradition that prized intelligibility and logical structure. Rooted in the classical legacy of ancient Greece and Rome, architectural design emerged from the Pythagorean worldview, where geometric reasoning served not only as a practical foundation but also as a source of intellectual legitimacy. As architecture evolved from a craft to an art form, its practitioners were expected to rely on forms and processes that could be rationally justified. Geometric principles—such

as the theorem of similar triangles or the properties of circular chords—were essential tools, enabling scaled documentation and precise construction techniques¹. Architectural elements were first derived from basic geometries, then manipulated through proportional systems and projection techniques, ultimately subjected to functional evaluation and categorized into stylistic frameworks. Mathematical reasoning shaped both the creation of built forms and the theoretical discourse surrounding them.

Throughout its history, Western architecture has maintained a strong connection to intellectually justified design, even as emotional and expressive dimensions began to emerge more prominently in the twentieth century. While the subjective experience of space—whether from the creator’s intent² or the user’s perception³—gained importance, it was still often analyzed and supported by empirical frameworks, such as environmental psychology. Even modernist architecture, in its rejection of ornament and historical references, upheld a rigorous internal logic based on proportion, structural clarity, and material expression.

Today, however, architecture may be entering an unprecedented phase. The foundational principle of explainability, central to the domain of shaping space, is increasingly challenged by shifts in the creative process. The widespread integration of artificial intelligence, the overwhelming availability of information, and the diminishing control of the individual author over the final outcome have begun to reshape architectural production. As algorithmic tools become more influential and accessible, the ability to trace causality or justify design choices in traditional terms weakens. This moment invites reflection: Are we witnessing a rupture in architecture’s long-standing contract with reason, and what does this mean for its cultural continuity?

2. STYLE PREMISES, TYPOLOGY

The early typological frameworks of European architecture, rooted in the legacy of Ancient Greece, were fundamentally ordinal and abstract in nature. At their core lay mathematically demonstrable models—idealized forms that served as the conceptual foundation for architectural creation. Through a process of transformation based on fractional proportions, these models gave rise to increasingly complex architectural details and compositional schemes. The resulting configurations often evoked anthropomorphic or zoomorphic associations—not as a product of empirical observation, but as outcomes of sophisticated manipulation within the domain of descriptive geometry.

This original architectural typology may aptly be termed Pythagorean, reflecting its deep entanglement with mathematical rationality and the broader intellectual tradition of Greek science and art. This typological paradigm dominated architectural theory and practice until the emergence of new intellectual currents in the Enlightenment.

The Enlightenment, propelled by advances in the natural sciences, introduced a fundamentally different conceptualization of architectural typology. Marc-Antoine Laugier, in particular, proposed a groundbreaking hypothesis⁴: the origins of architectural form could be traced to primitive, “genetic” structures found even in the most rudimentary shelters. In contrast to the

¹ Vitruvius, *O architekturze ksiąg dziesięć*, Państwowe Wydawnictwo Naukowe, Warszawa 1956.

² P. Zumthor, *Thinking architecture*, Birkhäuser, Basel 2010.

³ K. Kuma, *Anti-object*, Architectural Association, London 2013.

⁴ M.A. Laugier, *Essai sur l'architecture*, Chez Duchesne, rue S. Jacques, au Temple du Goût Paris 1753.

abstract formalism of the Pythagorean tradition, Laugier’s architectural anthropology sought the roots of regular forms in the cultural and natural environment rather than in pure geometry.

While Laugier laid the philosophical groundwork, it was his intellectual successor, Jean-Nicolas-Louis Durand, a student of Étienne-Louis Boullée, who systematized and extended this approach⁵. Durand’s typological method culminated in the publication of a comprehensive architectural atlas that presented building components—plans, sections, and elevations—in standardized scales. These elements were classified both according to their geometric configurations and their functional roles. In doing so, Durand’s work mirrored the scientific natural atlases of the Enlightenment, elevating architectural typology to the status of empirical, taxonomic inquiry.

This typological impulse experienced a decline during the early modernist period, when formal innovation and functional rationalism overshadowed historical reference. However, it resurged powerfully in the post-World War II era, particularly through the work of architects such as Robert Venturi and Aldo Rossi. Rossi’s manifesto at the 1973 Milan Triennale marked a pivotal moment in architectural theory, inaugurating a neo-rationalist movement grounded in typological reasoning but oriented toward the historical and urban evolution of form.

In Rossi’s theoretical framework, architectural types were not derived from abstract principles but rather studied as emergent entities shaped by their milieu—the urban environment in which they persisted and transformed⁶. This shift represented a fundamental departure from Pythagorean logic. Architecture was no longer conceived primarily as the product of intellectual construction, but as a phenomenon embedded in time, place, and socio-cultural processes. The typological object became a lens through which the entire life-cycle of architectural forms could be understood.

Over the subsequent two decades, the neo-rationalist trajectory inspired further theoretical developments. In the work of Rob Krier⁷, for instance, typology gained increasing autonomy, eventually functioning almost as a generative language—a permutational “alphabet” of architectural elements. This conceptualization reinforced the role of typology not only as a classificatory tool but as a dynamic system of design thinking, capable of both referencing tradition and generating innovation.

3. DESIGN BY THE RULES

While typology has served as a valuable tool for interpreting and preserving architectural tradition, its focus has largely centered on the morphological characteristics of built forms. Alongside typological classification, architectural discourse has also pursued deeper inquiry into the generative mechanisms behind the emergence of architectural types and compositions. This line of investigation—rooted first in logical reasoning and later extended through algorithmic frameworks—has enabled the analysis of how architectural forms evolve and interconnect within complex systems.

Architectural orders, as morphological schemas, are inherently rule-based constructs. In an algorithmic sense, they are generated through sets of formalized instructions that ensure

⁵ J.N.L. Durand, *Recueil et parallele des edifices de tout genre*, Paris 1801.

⁶ A. Rossi, *Architecture of the city*, MIT Press, Cambridge 1982.

⁷ R. Krier, *Architectural composition*, Edition Axel Menges, Stuttgart 2010.

internal consistency, repetition, and therefore recognizability. In ancient Greece, such rules were often derived directly from Pythagorean mathematics. They governed both form-making processes, anchored in descriptive geometry, and compositional strategies, which relied heavily on proportional relationships and harmonic ratios⁸.

As architecture developed, so too did the complexity of its design methodologies and representational tools. The increasing sophistication of geometric operations and documentation practices led to a corresponding expansion of underlying rules. However, these rules were frequently applied intuitively, without explicit articulation within theoretical discourse. Nonetheless, their presence can be discerned through retrospective analysis aimed at reconstructing typological algorithms. Notably, George Hersey and Richard Freedman⁹, through the application of shape grammar, decoded the architectural language of Andrea Palladio. Their work produced generative tools capable of producing plans and elevations conforming to the stylistic logic of Palladian architecture.

The study of architectural rules holds greater potential than mere historical classification or stylistic recognition. It offers a framework not only for understanding past patterns but also for generating new designs, modifying existing systems, and critically evaluating architectural performance. This perspective is central to Christopher Alexander's *Pattern Language*, a theoretical construct that prioritizes logical design instructions over purely intuitive or aesthetic choices. Alexander's methodology has significantly influenced design thinking, promoting the systematic organization of spatial knowledge.

In contemporary practice, the principles underpinning rule-based design have found robust expression in digital environments. Simulation, parametric modeling, and optimization technologies now facilitate the creation of architectural solutions that adhere to predefined principles. These tools enable the generation of design families based on shared parameters and support performance analysis across diverse criteria. As a result, rule-based design is no longer confined to theoretical exploration; it has become an operational paradigm in the digital age, shaping how architecture is conceived, developed, and assessed.

4. GENERATIVE PROCESSES, IMITATION, LARGE LANGUAGE MODELS

The architectural tradition has historically been shaped by a framework of rational continuity. Through education and deep cultural grounding, architects have gradually expanded the architectural lexicon—evaluating morphological patterns, refining rule systems, and inventing new tools and typologies. Design solutions have typically emerged through a deliberate synthesis of inherited and newly developed patterns, tailored to the demands of specific contexts. Each architectural response was a product of informed reasoning, where creativity was directed by logic, tradition, and accumulated expertise.

In recent decades, however, architecture has begun to encounter a new paradigm—one shaped by developments in artificial intelligence, particularly in the field of machine learning. Among the most transformative of these innovations are large language models (LLMs), which have introduced novel opportunities to depart from conventional design methodologies.

⁸ J. Słyk, *Źródła architektury informacyjnej*, Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2012.

⁹ G.L. Hersey, R. Freedman, *Possible Palladian villa*, MIT Press, Cambridge 1992.

The conceptual origins of such generative systems trace back to the 1960s, with early explorations into autonomous agents capable of navigating closed rule-based environments, such as chess. These early models focused on pattern recognition, decision-making logic, behavior optimization, and human-interpretable knowledge extraction.

It was not until computational power advanced sufficiently to handle vast datasets that machine learning entered widespread application. For architecture, the most consequential breakthrough has come through the development of natural language-based models. Since the early 1990s, institutions like IBM, Google, and OpenAI have pursued the ambition of crafting the most effective human-computer interface—leading to the emergence of increasingly sophisticated LLMs. These models are designed to absorb the full breadth of human language and to engage in meaningful, context-aware communication based on linguistic structures.

Crucially, because machine learning models operate on numerical data at the core, the form of input or output—whether text, image, vector, or numerical array—is not inherently restrictive. This multimodal capacity allows LLMs to integrate diverse information types, provided they are accompanied by appropriately structured metadata that links them to a linguistic framework. This convergence opens new potential for creative domains, including architecture.

Architectural design using LLMs represents a significant shift in process. Instead of meticulously defining generative rules, analyzing their parameters, and constructing custom design tools, architects can now engage in a more intuitive workflow: initiating generation from a broad reference corpus—regional or global architectural heritage—via natural-language prompts. Design outcomes are produced iteratively, with refinements applied through dialog-like calibration rather than fixed procedural programming. The process becomes one of associative synthesis, drawing from the vast archive of existing architectural patterns rather than constructing them step-by-step from first principles.

Despite this promise, current AI tools remain limited in their capacity to generate fully integrated architectural solutions. There is a noticeable absence of robust models that operate on detailed, three-dimensional digital building data, and the available volumetric reference datasets are not yet sufficient to train such systems effectively. Nonetheless, these constraints appear to be temporary. Advances in geospatial data acquisition, photogrammetry, and 3D scanning are rapidly expanding the available corpus of digitized architectural forms. It is foreseeable that in the near future, multimodal LLMs will have access to comprehensive spatial data, enabling them to interpret, replicate, and innovate upon traditional architectural typologies in three dimensions.

When that threshold is crossed, architecture will face a transformation already underway in fields such as visual arts, graphic design, music, and literature. The role of the human creator, the meaning of authorship, and the criteria for evaluation will need to be redefined in light of AI's generative potential. This impending shift calls for a critical reevaluation of creative processes—not as a rejection of tradition, but as an evolution of how we access, manipulate, and extend it through emerging technologies.

5. INNOVATION, AVANT-GARDE

From a theoretical perspective, avant-garde art has traditionally been understood less through its formal qualities and more through the ideological, psychological, and behavioral

dispositions of its creators. Renato Poggioli emphasized this interpretive framework by prioritizing the attitude of deliberate dissent over the morphological or semantic analysis of the artistic work itself¹⁰. He described the avant-garde as characterized by a conscious stance of opposition—a desire to position oneself outside prevailing social norms and aesthetic conventions. For Poggioli, this impulse often arises from generational conflict and a drive to confront and overturn the status quo. In this view, the avant-garde does not conform to any singular aesthetic or structural program; rather, it manifests as a state of mind and a reactionary force against established tradition.

Considering such a definition, the application of artificial intelligence in the creative arts—particularly machine learning models such as large language models (LLMs)—raises important questions. A common critique posits that AI, by its nature, cannot originate truly novel ideas. It functions by identifying and recombining patterns from preexisting, human-created data, seemingly precluding any capacity for authentic innovation or subversive intent. If we adopt Poggioli’s lens, AI lacks the subjective agency and oppositional consciousness typically associated with avant-garde movements.

Nonetheless, this does not foreclose the possibility of simulating avant-garde characteristics within a digital framework. The architectural tradition itself contains patterns of formal rupture and deliberate discontinuity—structural analogs of conceptual dissent. Once such patterns of formal “otherness” are identified and codified, it becomes possible to program generative processes that emulate the mechanics of innovation, even if they do not stem from conscious rebellion.

Pioneering work in this domain was undertaken in the 1970s by George Stiny and James Gips¹¹, who explored the digital formalization of aesthetic systems within a structuralist paradigm. Their research sought to distill the rules and underlying principles of style, categorizing artistic systems as constructivist (focused on expression-based order), evocative (based on interpretation and semantic resonance), or composite (blending features of both). They also developed algorithmic approaches to aesthetic evaluation, including a framework for assessing novelty.

According to Stiny and Gips, the coherence of an aesthetic object is inversely related to the length of the input phrase that defines it within a rule-based system, while its richness or complexity corresponds to the length of the output phrase describing it. In other words, simpler generative rules may yield more intricate outcomes. They further suggested that principles of information theory—specifically entropy—can be used to measure artistic uniqueness¹². If the descriptive phrase of an artwork has a low probability of recurrence within the environment, the work can be considered more unique or innovative.

While it is still too early to claim that we possess a fully operational framework for the digital identification or generation of avant-garde architecture, many of the building blocks are already in place. LLMs can process and model the architectural tradition, learn and reproduce typologies, and simulate formal variation. They can be trained to recognize and manipulate patterns associated with aesthetic systems and to produce outputs with varying degrees of novelty and coherence.

¹⁰ J.A. Richardson, *The Theory of the Avant-Garde by Renato Poggioli*, “The Journal of Aesthetic Education” 1969, no. 3, p. 169.

¹¹ G. Stiny, J. Gips, *Algorithmic aesthetics*, University of California Press, Berkeley 1978.

¹² *Ibidem*, p. 110.

Importantly, we now possess not only the computational means but also the theoretical tools to evaluate innovation digitally. By employing algorithmic and statistical models, we can begin to quantify aspects of originality, aesthetic value, and stylistic deviation. These developments suggest that while AI may not consciously initiate an avant-garde movement, it is increasingly capable of generating and evaluating work that reflects its formal characteristics—and may thus become a key player in the next phase of architectural experimentation.

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