

# Speed and Madness: An Interpretation of architectural Form based on Futuristic theory

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**Abstract.** Futurism as a word to describe the general trend of modern design, the desire to create a kind of prophetic architecture. Futurism is not a style, but an open way of building; It has been reinterpreted by different generations of architects over the decades, but often with striking shapes, dynamic lines, strong contrast and the use of advanced materials. Through horizontal comparison of architectural works with significant futuristic features in different regions, this paper makes a formal interpretation of architectural works from the perspective of futurism theory to explore the influence of futurism on the formation of architectural forms.

## 1 Introduction

In the early 20th century, under the influence of the avant-garde movement, designers observed and applied new concepts of dynamics and mathematical logic in their works. Avant-garde art is being systematized, mathematized and mechanically reproduced; at the same time, this rationalization is being questioned as art becomes entangled with European mechanisms of increasing dehumanization, war and destruction. The separation between art and technology is fast disappearing, but in other areas of the arts, such as literature and painting, this biomechanical "synthesis" is harder to achieve and the break with tradition is more hesitant. Futurist art nouveau sensibility includes not only criticism but also assimilation of technology and its processes. The machine metaphor is mobilised to represent technomania and technophobia about the future. Artists, in particular, who call themselves futurists, approach their craft as technologists, constructing their artworks through new technologies that fuse aesthetics and function. Futuristic themes, styles and approaches reflect the latest scientific and technological developments, and machines become the primary objects of their fears and aspirations.

Since Cezanne opened the chapter of modern art, art has been inseparable from the expression of ideas. The strong influence of modern industry divides architecture into pre-industrial "Archeological Architecture" and post-industrial "Technical Architecture".<sup>[1]</sup> However, the ideology of denying industrialization and mass machine production against the historical trend avoids the overflow of "materialization phenomenon", but it also falls into the utopia of self-escape. The turbulent social environment brought about by the two world wars and the gradual alienation of the global postwar economic pattern pushed modernism to the forefront of The

Times. But modernism is not just another style, it is a new way of thinking, focusing on social functions and specific needs, but not simply imitating nature. A large number of painters and architects live in this chaotic and bizarre historical era. The traditional conservative style can no longer meet the needs of artistic expression. Only the anti-traditional art forms and styles can break the shackles of history and times. These works abstractedly reflect the experience of depression and despair, the sense of crisis of modern western capitalist culture and civilization and the new orientation of urgent change.

In the Declaration of Futuristic Architecture, St. Elijah strongly criticizes the retro, emphasizing that modern science, technology and industrial transportation are forced to innovate human spiritual life due to the change of human material life.<sup>[2]</sup> Futurism was widespread in Italy from 1911 to 1915 and spread throughout Europe during World War I. Only the natural contours and shapes of architecture give people the pure beauty of lines and volumes; Buildings will be rugged as machines.<sup>[3]</sup> It is not difficult to see that the perspective of "futuristic" architecture is one-sided and extreme, and it also clearly and unequivocally points to the most profound reform. Contemporary art often expresses the desire to change the real world, which requires the support of powerful ideas. Every way of thinking and artistic expression that can inspire those who dream of future innovation audiences is simply called "futurism". Art cannot transcend The Times forever, but is only a tool of The Times. Nowadays, digital technology gives architects greater freedom to explore new architectural styles. Computer-aided technology can easily connect the concepts of dynamic, structure, fragmentation, gestalt and so on to complex architectural styles, and also push us to move forward to new structural forms and architectural expression techniques.<sup>[4]</sup>

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## 2 Futuristic architecture in Italy and Europe

Italy as European ancient history as well as the birthplace of Renaissance, who was known as "art", but the view in the future, it is the tradition handed down from the accumulated art make Italy in the past, the weight of the golden age stalled, crushed the decadent boring traditional drag down the step into the new in Italy.

In Marinetti, Celebrating the impact of violence, slaps and punches, this is the biggest difference between futurism and other modernist trends. From the beginning, it was tied to politics. On a spiritual level, futurism is about expecting genuine emotional responses -- celebrating cities, machines, war -- and wanting to make everything new through blood.

### 2.1 Lingotto Factory - Giacomo Matte enrolled - Trucco

Located in the Milifonti district of Nice, Italy, the Ringeteau factory is recognized as "the world's first futuristic building". North American industrial buildings give designer matt LuKe inspiration, decided to "in production technology and production mode of the emerging industrial technology to expand capacity," the goal as a starting point, made the first reinforced concrete structure building in Italy, such a highly modern, strength, future-oriented construction caused a great sensation. The Lintaw Automobile factory not only plays an important role in the history of modern architecture, but also is listed as one of the important industrial heritages in Europe.



Fig. 1. Lingotto Factory, in 1928.

The Ringeteau plant is about 500 meters long and five stories high. This is the first precedent for a modular reinforced concrete building based on three constituent elements: repeated columns, beams and floors. Its architectural space sequence is equivalent to a strict automobile production line, from production to precision machining.<sup>[5]</sup> Industrial buildings embody a strong sense of time and simplicity. The strong sense of volume and strong guidance of linear space reflect the simple and rough design concept of industrial buildings at that time and the machine aesthetics of the industrial era.<sup>[6]</sup>

### 2.2 Graz Art Museum - Peter Cook/Colin Fournier

The Graz Art Museum is located on the Grazmur River in Austria. The Art Museum intervened in the historical town in a distinctive and unusual way. Its exaggerated shape, non-European geometry and strange texture of the surface immediately caused a huge controversy at the beginning of its establishment. Graz people affectionately called it "friendly alien" and regarded it as "an invitation from an experimental object".<sup>[7]</sup> The architect Peter Cook wanted to have this "bubble" and then have somebody stand there and watch something happen to them; Go and see what it is.

In a sense, the Graz Gallery is more closely associated with Baroque churches and walls: as if part of the same conspiracy to see every aspect of its prosperity up close.<sup>[8]</sup> It makes the exploration of an art gallery an unbalanced dynamic experience that contributes to the unpredictability of the space, and it luxuriously offers two ways of appreciating the artwork: one that is casual and effortlessly glides over the traveller, and the other that is more focused as it penetrates back to the ground. The free form structure of the art museum shows fluidity, nonlinearity, organicity and continuity. The spatial form aspect interprets the Blob theory of Greg Lim. The "friendly alien" devours everything with its traveler, like a giant Hoover, like the belly of a whale, evoking distant memories and unconscious desires of being devoured by dragons since childhood; It's a black hole in the belly of a whale where people can find all kinds of things. This is also what makes the Graz Art Gallery most special -- a place that fulfills the desire to find out about yourself the surprising and unexpected, the strange confrontations, the things that sometimes haven't been fully digested.



Fig. 2. Kunsthau Graz

The Graz Art Gallery defines the beginning of a building that resembles nature not only in form but also in behavior, and that, with the help of robots and artificial intelligence, may one day become truly active and respond to environmental forces and human needs and desires.<sup>[9]</sup> The biggest potential advantage of the gallery's plan is that it has no fixed substance, and the museum has no permanent collection. Not having to tailor the building to any particular function is very liberating, and it may make the gallery more like a chameleon, always changing its appearance, whether externally through its programmable electronic facade, or internally to adapt to the fresh needs and styles of

each short exhibition, facing the public each time with a new experience of architecture.

### 3 Soviet Union and Eastern Europe

It was in the Soviet Union that futuristic architecture really flourished. The Bolshevik Revolution not only overthrew the rule of Imperial Russia, but also liberated people's minds. The biggest feature of Soviet architecture is to witness the healthy development of futuristic architecture. On the other hand, it is a new generation of building techniques and architectural logic caused by new materials and new technologies caused by the industrial revolution, which seeks a complete break with tradition, innovation and independence.

Unlike the Western world, Soviet architectural design had a new interpretation of futurism. This type of architecture was called "Stalinism" and had a unique flow and beauty. This is a type of architecture full of "alien character", breaking the rules and constraints in the old architecture, overcoming the inherent basic form of architecture as much as possible, and appearing in a serious and solemn form. The overall architectural style is more different, focusing on the artistic image of the building, building structure and composition, pay more attention to the building capacity, the development of all cast-in-place various industrial system buildings, such as assembly and cast-in-place combination.<sup>[10]</sup>

With passion and vitality, the architecture excites the great passion for the socialist ideal and the exploration of the universe. This state of selfless passion also has its detachment, is a radical and unbalanced reality. These buildings are not only neo-futuristic visions of future urban development, but also ideological cybernetics - these buildings are seen as ideal vehicles for creating a new world.

#### 3.1 Druzhba Sanatorium - Igor Valikievsky

Described as a "utopian resort", Druzhba Sanatorium is a complex site with a reinforced concrete core supporting the floor slab to create a rigid circulation tower to support the entire building. This very creative technique later became one of the new directions for the development of slope, landslide and other areas. All the elements of the building, including the floor, horizontal and longitudinal walls, serve as the structure, and a massive five-story monolithic honeycomb beam solves the problem of having no structural elements to support it.

This approach of "raising the ground building and letting nature flow underground" is called "spatial city Law". This design approach determines the relationship between the building and its surroundings -- nature as the first component: creating a large-scale environment by connecting nature to people and making space for individuals within the natural environment.<sup>[11]</sup> This is why Druzhba is called a "spaceship". The design of the interior Spaces follows two principles: first, the use of natural light and visual connection with nature, no visual barriers in the main room, lounge and swimming

pool; Secondly, sunlight and sunshine as an important natural index of recuperation architecture fundamentally affect the whole structure. The concept of "wholeness" is applied to every gap of the space division, and the boundary between public and private parts becomes the focus of the design: For example, the sleeping area, in contrast to other activity areas, is obviously its boundary as a closed public area located within the outer boundary, and one is alone in his bedroom with the nature he retains, then the public part that actually occupies the center becomes the dominant place on the whole.



Fig. 3. Druzhba Sanatorium

#### 3.2 Institute of Robotics and Technical Cybernetics/State Scientific Center -- S. Savin, B. Artiushin.

The order and system created in the special period of the Soviet Union grew up on the edge of a number of futuristic buildings belonging to machinery and the universe, with strange shapes detached from reality. Created a strange urban landscape and "abnormal" architectural form.



Fig. 4. RTC

The center of the building at the Cybernetics Institute for Robotics and Technology (RTC) resembles a mechanical white tulip, on which the light form of the flower is presented alongside the weight of concrete and machinery; The sharp edges of the concrete building resemble the structure of an accordion. The building, from space function to architectural form, reflects the Soviet Union's spiritual pursuit of space travel everywhere and the importance of the Soviet Union's position in space competition. The institute is not only

the leading institution in the field of robotics in the Soviet Union, but also a well-known example of Soviet architecture. It is an architectural expression of Russia's dominance in space travel research.

Fueled by the science fiction culture of the space race, the Soviet Union fell in love with a surreal force. In the avant-garde and futuristic dream, the architecture also pursues a new innovation that expresses the architecturally vibrant and gravity-defying universe and speed, their forms depicting a future that represents speed and light.<sup>[12,13]</sup>

## 4 Japan and Asia

After the Second World War, the world economy gradually recovered, the living standards kept improving, and the number of young people with higher education increased rapidly. At that time, the war was over, and the peaceful world made people feel relaxed, happy and energetic. Young people faced the possibility of great changes in society with full passion and optimism. At the same time, severe social unrest and the Cuban missile crisis underscored that technology would produce visible change. Crises and challenges coexist, opportunities and tribulations go hand in hand. The re-division of the world pattern led to the emergence of an ideological wave of "anti-modernism" among European architects, which was deeply recognized by local architects after being spread to Japan and catalyzed a utopian architectural school -- "Metabolism School".

The concept of large building metabolism guided the architect's transition from a natural "space" to a "fluid environment". In addition, the focus of social and economic growth is to combine the development of engineering and technology with the construction of information society to create a new living environment in which social information infrastructure no longer builds Internet and communication platforms in new forms, thus depleting the natural environment.

### 4.1 Shizuoka Press and Broadcasting Center -- Kenzo Tange

The Shizuoka Shimbun Tokyo Branch building, built in 1967, is located on the corner of the Ginza district of Tokyo, next to the road. The floor area of the building is relatively small compared to other office buildings because the core is distributed in the center of the building, with offices hanging as branches and extensions on both sides of the core. This layout breaks the rigid layout of traditional office buildings, and the service facilities such as elevators and stairs are located in the core for easy use. The core tubes can be continuously replicated and connected by corridors, thus forming a structural form with the core tubes as the skeleton and the offices as branches. The building can be replicated and grown like a cell. This is also one of the main features of "New city thinking" by Kenzo Tange, a representative of the "metabolic school" at that time.

Behind the idea of metabolism is a strong premonition of the disappearance of "eternity" and the

confusion and constant exploration of time and the future. The alienation of public thought in the age of consumption brings indifference and irrational thinking on the destruction and extinction of architecture, which makes architects hope to arouse people's thinking on life and death through the time element embodied in architecture. In order to break this "time curse", architects introduced growth, change, metabolism, process, mobility and other time factors into the city and architecture, in an attempt to use the change of time to clarify the cycle of each element. In terms of long-term factors, mobile equipment and short-term factors, the gradual transformation of outdated components is emphasized to form phased links. In another sense, architecture can achieve "permanence" in constant renewal and alternation.<sup>[14]</sup> All the architects of the metabolic school wanted to show "the future design of the future world," and the physical and mental ravages of war made people try to reconcile a general sense of cultural anxiety with the "happiness of survival."



Fig. 5. Druzhba Sanatorium

### 4.2 Lingotto Factory - Giacomo Matte enrolled - Trucco

The design concept of Bangkok Grand Kyoto Building is "create a floating living space in the city". The biggest feature of the building is the integrated living space wrapped under the sculptural building outline, which is presented by the "pixelated" expression technique, which not only achieves continuity and unity inside and outside, It also projects the image of human life and activities to the distant place in a conceptualized way. The towering volume not only transforms Bangkok's skyline, but also becomes a landmark of the city, reflecting Bangkok's rising status in the global cultural sphere.

The idea behind MahaNakhon was to bring the life of the city to the tower in a dramatic spiral motion; The tower is open to the public from the base to the top. The path of human activity moves from the open public square to the private interior of the building, to the open tower platform, and up the pixelated shaft to the top floor of the building, returning to the public sphere. Not only is this a project deeply rooted in the city and the public sphere, and claiming to be an active part of it in an expressive way. The design breaks away from the

traditional tower type of a strangled monolithic base, with both planned and spontaneous cultural activities, as well as a safe space to retreat from the hectic street life; To respond to unfinished or unfinished urban construction with an "erosive" geometry. The gray space brought by "erosion" becomes a living space facing the city, combining indoor and outdoor, and awakening a harmonious living attitude.



Fig. 6. King Power

## 5 Conclusion

If futurism is considered to be the construction of a building, there is a high probability of no formal or explicit composition, because the basic characteristics of futurism are impermanence and transience. "The rapid development of science and technology is the most crucial reason for the dramatic changes in contemporary thought, followed by changes in human society and the natural world." The contemporary avant-garde architects have opened up the creation method of interdisciplinary integration on the way of seeking architectural creation, and explored the development of the architectural discipline from the avant-garde architecture and experimental architecture.<sup>[3]</sup>

As a kind of world art, architecture is endowed with the richness of material entity form first. It needs a unique way to face modernity and future, recognize the unique conflicts and ambiguities of modernity, overcome them through these contradictions and express various conflicts and uncertainties in modern life.<sup>[15]</sup> The courage and boldness to break the present and stride into the new context represented by futurism is what we need most in modern design.<sup>[17,18]</sup> It is true that futurism had its time limitations and bias at the beginning, but perhaps it is this almost crazy "stubbornness" is its most fascinating.

By pursuing speed, strength and time, futuristic architecture achieves anti-historicism. Long lines are often used to symbolize movement and change, vitality and expressive force, urgency and lyricism of time, and strive to make the architecture belong to the modern era. Futurism brings the design pursuit and value judgment of "breaking the present". The sense of the

future brought by architecture reflects the visual image presented by the broken visual and auditory symbols of architecture, which causes the heterogeneous changes of the spatial form of architecture such as fragmentation, conflict, dislocation, variation, dynamics and instability.<sup>[16]</sup> Since its inception, futurism has been characterized by movement, speed, a sense of ascent against gravity, tilt, asymmetry, and nonlinearity. After more than 100 years of development and change, the spirit of futurism has been supplemented and re-developed.

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