

GEOMETRICAL BREAKTHROUGH IN CONTEMPORARY ARCHITECTURAL DESIGN: META-MATERIALITY AND FRAGMENTATION

A B S T R A C T

The study relates two historical categories that were not previously associated in this manner. One concerns the role of geometry in the transformation of space in the Gothic architecture, where geometric line made the position of physical forces visible for the first time. The second transformation that sees the release of anxiety in challenging the perspective was done in Mannerism by instrumentalisation of the metaphor using visual means of deformation and figuration. Today we experience both historical moments in a modified form of appearance, still trying to give a formal character to the matter of materiality. As it is not possible, this approach has resulted in fragmentation in the absence of a unitary radical critique of modernity. Fragmentation and meta-materiality of contemporary architecture today represent a possible conceptualisation of space invoking all known forms of dematerialisation and disappearance of the world, including digitisation. Referring once again to the myths of the Tower of Babel, the Fall of Icarus, and the Wizard of Oz, in this experiment myth and discourse persist together, turning into the other and finding themselves in the other. Building architectural position between the extremes of the metamaterial and the fragmentary is a matter of breaking geometry of form and the idea of it..

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META-MATERIALITY AND REALITY

Interest in contemporaneity emerges with the weakening of interest in the postmodern condition. If postmodernity is understood as a cultural state rather than an era, which marks the end of grand narratives following the end of modernism, or as a temporal concept of the cultural logic of late capitalist production, how can we interpret contemporaneity? It could be said that contemporaneity of architecture is defined in terms of the need for a dynamic spatial interaction that enables reactions to changes in the context. For the reaction to be possible, the question of time must be central in relation to the dynamic continuity of architecture. In it, time is the context – a condition for discursive contingency. Contingency of architecture relies on the fact that things can be different than they are.¹ For this reason, the question of form becomes the question of time, while the perception of time is visible in disconnected and discontinuous fragments, though of the same totality. The growing fluid sense of temporality changes the present,² and to be contemporary is to coexist with something else, in relation to which we position ourselves, either as a reflection, or a timeline, but not as a historical position.³ The world of reflections and reproductions, transformations and digital information - the world we live in - has led to the loss of substance of the real in the realisation of the world by abstracting the visual from the space-time concept. Debord interprets fragmentation of the visual experience as an image, in contrast to the reality of lived experience, and the spectacle as a function of the historical development of modernity, that is, the fragmentary experience of the spectacle is defined as the perception *per se*.⁴ Visual experience that results from being overwhelmed by images and information creates fantasies that have no basis in the real. In absolute visibility and transparency of technological appearance, objects become empty signs that describe *the emptiness and absence of the hierarchical organisation of elements*, and as such, they constitute a hyperphenomenon without a game of visible and invisible, all through a distorted view.

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Only the visible gives a constructive dimension to the world. What is not me – what is beyond me – different from me – beyond the boundaries of the body – opens up the question of space or spatiality based on the positioning of the object. I am what is around me, says Wallace Stevens,⁵ while Noël Arnaud, also a poet, argues - *I am the space where I am*.⁶ However, the experience of architecture is also interpreted as an experience of multiple perceptions gathered asone, not only seemingly, coherent totality.⁷ In this sense, the observed object is always just a frame of something ‘partly’ defined - external characteristics that never appear simultaneously and completely. The object

transcends them precisely by being in each of them, so that all appearances of the object are its appearances. They make it present and absent at the same time, taking into account that appearances are never the object of perception itself. It is the infinity carried within itself, given that the set of its characteristics extends beyond fragmentation of its substance, the possibilities just as much as the characteristics.⁸ Thus, fragments of the object can be interpreted as its characteristics, those that are not fully revealed. Their potential includes traces of multiplicity - parts of a whole that is not in the domain of visible, but only in a distant perspective. Therefore, the present fragment always indicates the absence, having a kind of elusiveness.

Behind the virtual reality in all its forms of appearance, the same way as behind every image,⁹ the real has disappeared. This is what fascinates and documents the disappearance of Blank: void, silence, contradictions, and opposites. It is clear that the digital lacks the moment in which it occurs. The digital is destined to fall into a random domain – a fragment of universal pixelation – which has nothing to do with projected distance or its negative.

New conditions of perception defined as a *postmodern hyperspace*,¹⁰ as Jameson argues, interpret the aesthetic experience as a routine of consumerism organised by technology. In it, coherence of the continuity of experience emerges. Thus, visual experience understood as a purely spatial experience signifies a loss of historicity. On the other hand, Virilio addresses historical transformation of the conditions of perception and questions the overcoming of image through the concept of *vision machine*. The machine links the progress with visual experience.¹¹ For this reason, visual experience can also be interpreted as disorientation and dislocation caused by speed – new conditions of perception without a metaphor that turn into a *new spatial logic*, a spatial simulacrum, not only to Virilio. The influence of technology can be easily explained in the example of the history of telescope, whose emergence has been interpreted as a destabilisation of the appearance of what had been outside but present until then. Development of optical instruments and mechanisms for visual reproduction has led to the experience of a shifted view and expansion of the geocentric horizon of perception.¹² In the same way, the visibility of reality always indicates something beyond, something that can never fully manifest itself. The character of perception is based on incompleteness, the moment when we become aware that there is infinitely more than we can see. In this regard, perception turns into intention to see something.¹³ Literal application of this principle turns the world of visible into the visibility of autonomous images: visual experience in its fragments. Virilio, Debord, and Baudrillard thus argue

that the world has lost its future permanently due to its total visibility, without mystique and seduction, because it is never blurred, never ambiguous, never distant, and precisely for this reason, because of the impossibility of grasping its capacities and dispositions, it is incredibly empty and worthless. If we go back to Berger, who argues that the way of seeing includes what is seen, the question of intention, even the question of object itself, remains outside such evaluation.

I was modern because of the method and not the form. Because form is the one that gives longevity to art, enables it to break away from modernity of its time, and launches it like a torpedo into the past and the future (Fig. 1).

- Marcel Duchamp (Interview by Achille Bonito Oliva, 1977)

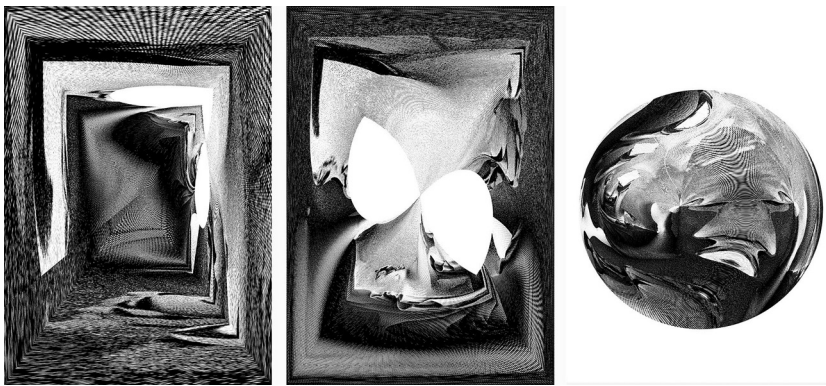


Fig. 1. Trompe-L'Oeil: Realistic in Ilusion, Master thesis, Life is a Dream (Calderon), Open air theatre, Natural core of Belgrade, Luka Grgić, (Tutors: Milenković, Čuković Ignjatović, Milojević, University of Belgrade - the Faculty of Architecture, 2020)

ARCHITECTURE IN GEOMETRY

The connection between geometry and architecture is unbreakable because the first has always been the very language of the second. The discovery of geometry in the Renaissance was a symbolic moment that marked the beginning of identifying the discipline of architecture beyond the crafts. This basically means that the middle of the fifteenth century announced the separation of architecture and its emancipation through approaching speculative sciences and philosophy. On the other hand, the essence of geometry has enabled architecture in modern era to be understood in its totality and to be developed in accordance with norms and using only its own language - separate from the idea of transforming reality. Nevertheless, unlike sculpture and painting, architecture has never gained the status of the so-called liberal art.

We are not sure, although it is likely, that Brunelleschi (1377-1446) was the first to prove the exact mathematical method of perspective in a plane, and whether this method factually existed in the construction of horizontal and vertical projections given that written accounts appeared only later.¹⁴ However, Masaccio's (1401-1428) frescoes already show a recognisable coherence of space that indicates a constructive method carried out 'as a rule' and uniformly.¹⁵ Panofsky argues that the emergence of systematic depiction of spatial depth that the Northern painting discovered empirically, using the methods of the Italian Trecento (Duccio and Giotto) in the Italian Quattrocento (Brunelleschi, Donatello, Masaccio), was uncompromisingly determined by reference to mathematical theory. In the mid-1430s, there was unambiguously described system that was at the time used primarily as a *costruzione legittima*, which was based, as Panofsky states, on a completely new principle, although presented as an improvement of what had already been known in painting.¹⁶

Filippo Brunelleschi, who was responsible for its initial application, is also the first known independent professional figure. In this sense, we can state that the subject of architecture appeared on the horizon of the European Renaissance together with geometric perspective. Once again, from the Renaissance onwards, this discipline has been something absolutely different from the crafts industry developed in the Middle Ages, while its constitution involves a shift of object from the built or material one to the ideal – the subject of thought and reflection. Such application of geometry not only elevates the artistic representation of space to sublimation of scientific knowledge, but it enables the idea of architecture as *cosa mentale*, whose understanding is often imbued with Neoplatonic thought and promoted by humanists and philosophers from Alberti (1404–1472) onwards. Prominence of the ideal, with the basis in drawing and geometry, enabled the emergence of the so-called 'paper architecture' two centuries later, represented by fantastic works of Piranesi (1720-1778) or Boullée (1728-1799). If the entire domain of the representation of object character is accepted, there is a relatively safe basis for forming the modern concept of disciplinary autonomy.

Architecture, like any other modern discipline, signifies an imaginary entity. Its vague boundaries and dispersion, according to Tahl Kaminer, are 'constituted by the accumulative effect of real institutions, organisations, and products.'¹⁷ No matter how diffuse and elusive in its appearances and character, architecture remains an instrument of a generalised, central power of prescribed language and norms. This excludes what would be absolutely the same or absolutely different: our comprehension of architecture is not without limitations, but it has

a primary empirical condition and limits of possibilities. In this way, its central domain is protected, preceding any idea or theory of an explicit form. The discipline of architecture has a certain geometric and perspectival awareness, a specific understanding and world view – a place and time in its canons - the issues and perceptions raised in debates. Its elusiveness is comparable to the elusiveness of object.

Discovery of the mathematical method of perspective in a plane, and the subsequent consolidation of architectural drawing and geometry, was not only the basis of its transformation, but also a hint of modernity. Once the systematic space was achieved as a specific expression of what was taught by the theory of knowledge and natural philosophy at the same time, partial spatiality of the Scholastic view was replaced by the construction of central perspective. Its infinite extension, with the centre in an ‘arbitrarily’ assumed point of view, would result in the lines of abstract thought that breaks with Aristotle’s view. Abandoning the notion of closed universe built around the centre of the Earth and the celestial sphere as the absolute limit,¹⁸ function of the Renaissance perspective becomes comparable to the function of modern criticism. The subjective impression has been so rationalised through the perspective that it could form the basis for the construction of this very (objective) modern (infinite) experiential world. The space that has already been united in the aesthetic image in the late Gothic period has been systematically united based on the natural formula of opposition to the Earth’s gravity.

The central perspective from the Renaissance has been only technically improved and facilitated later. This is due above all to its exactness and stability of visual representation, where all figures are included without exception in a unique and unlimited system of size relations. Shaping of such a completely rational, which means infinite, homogeneous, and continuous space, required a bold abstraction of reality. In order to express the totality of content, it, in Panofsky’s words, ‘negates the difference between the front and back, left and right, body and the medium (...); it disregards the fact that we do not see with one fixed eye, but with two constantly moving eyes.’¹⁹ In addition, the visual field includes a spheroidal plane of projection, which means that the perspective does not take into account a ‘huge’ difference between the real projection and mentally determined visual image. Hence, perspective, not so much the result as the definition itself – is the instrument of abstraction – the objective in which homogeneity and infinity that are completely unknown to mental experience are achieved through the representation of space. Thus, perspective transforms the space into mathematical and logical one, it implements consistently

the constructive and real space of Euclidean geometry. Once established, perspective has become a visual tool that links the language of architecture with geometry for good. Separating the subject from the object, it reduces the phenomena to stable, exact rules, but it also makes them contingent upon the individual given that how it will consequently appear depends on a subjectively determined central point, freely chosen. On the one hand, it announces a triumph of the distancing and objectifying a sense of the real, while on the other, it strengthens subjective tendencies towards the power to negate the distance. Subjective power is manifested not only as the systematisation and stabilisation of the external world, but also as the expansion of inner sphere of the self.

Architectural drawing has a specific, peculiar status in this regard because as a representation of an object that does not exist yet, it hardly fits in the Renaissance category of mimesis. Nevertheless, it relies on the idea of semblance. In the sixteenth century, the projection tends to resemble, while in the seventeenth century Classicism, it tends to be identical with the representation of the future object. The manner in which the discipline functions, as well as the manner in which architecture perceives itself, is largely shaped by the relation to the drawing technique (projection) and the projection of reality.²⁰ The ambivalence of the perspectival method further destabilises this order, raising the very problem of meaning: the claim of ‘the object confronts the ambition of the subject.’²¹ There is no doubt that this nineteenth century paradigm could be expressed only through well-known historical oppositions - formalism and rationalism, individualism and collectivism, but also through free will and established norms. The tendency to perceive architectural drawings as notations, sets of abstract functions and instructions rather than complete representations, as argued by American philosopher Nelson Goodman in the late twentieth century, has resulted in insufficient divergence from the classical representative content of architectural drawing. Naturally, its theoretical disintegration has begun even before the early modern discourse, but this aspect has been still retained and tacitly accepted in practice. This means that our perception of architecture is still governed by dialectical oppositions, such as the one between form and programme, or appearance and function. Hidden in the aspect of representation, projections remain undisturbed by the practice or courage of architects.

This may be the reason why the issue of geometry is wrongly linked to the object because together with the idea of determining what it is, there is a recurrence of the mentioned dialectical oppositions. More important question is what it means, not only to the space surrounded by it, but also as a moment of stylistic history and a symbolic form of spiritual significance. In this sense, for certain

epochs it is important not only whether they have a perspective, but also what kind of perspective they have.²² In early modern architecture, whose language and norms remain inextricably linked to constructive geometry, regardless of their transformation, there is a ‘secret history’ of divergent relations: turning a work against its own geometric truth. Every decadence initiates three categories: truthfulness, unity, and purposefulness. The first equals the breakdown of certain structural logic. The second degrades the unity of space. The third fragments the directed, anticipated, and finalised temporality.²³

Since a three-dimensional object casts two-dimensional shadow, we should be able to imagine the unknown four-dimensional object whose shadow we are (Fig. 2).

- Marcel Duchamp (Regions which are not ruled by time and space, TV interview by James Johnson Sweeney, January 1956).

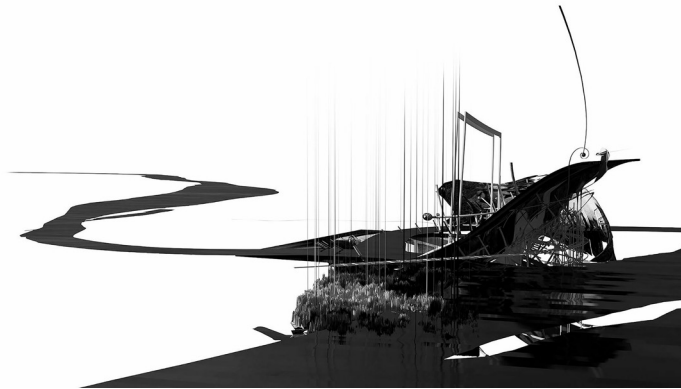


Fig. 2. Trompe-L'oeil, Final project, Life is a Dream (Calderon), Open air theatre, Natural core of Belgrade, Luka Grgić, (Tutors: Milenković, Čuković Ignjatović, Milojević, University of Belgrade – the Faculty of Architecture, 2020)

BETWEEN SCALE AND PROPORTION

The proportional system as a principle of shaping has had a greater significance in architecture than in other arts since architecture primarily works with models in relation to the immediate content of reality. For this reason, in the sudden prevalence of digital production, the loss of the Module could be equated with disappearance of the Ideal. The lost substance tacitly transcends into the model of representation. Thus, before any shaped content, the idiom of authenticity shapes architecture, adapting it to the ideology of use, even when it tends to

oppose it the most. Some (special) fragments acquire a (special) value as part of material truth because their empirical accessibility deceives with almost physical closeness. Incomplete or over-emphasised figures combine in them the metaphysical and specific. Full of pretensions to the Ideal, they actually do not go beyond the standardisation of the world they refer to.

Stratification of space in open fragmentation hides the logic of a system that uses its opposite as a principle of organisation. This means the disintegration of the linear geometric code to impressions that speak of themselves, and at the same time, the beginning of the disappearance of style. Perhaps it is precisely thanks to the projected linear geometry, leading to the emancipation of drawing, that nonlinearity and curvature of the image of our times no longer has the constitutive value of architectural knowledge.

Due to optical constraints, such as lateral deformations and subjective distance from projection, the so-called *prospectivae artificialis* loses its character of a craft and becomes solely a matter of artistic form. Restoring its scientific value through the early modern discourse of applied geometry corresponds with restoring faith in the integrity and purposefulness of the model-truth contained in the fragment of architecture.

On the other hand, geometry still does not exclude the possibility of systematic abstraction of physical and metaphysical space of the Deleuzian position and material being of the object of architecture. The presented figures would otherwise remain a void in content – Descartes' void with ideal proportions – Deleuze's memory of something that no longer exists – Kasirer's issue of the difference between body and the medium – once again, Cartesian *quantitative continuum*. Does this mean that geometry really abstracts spatial material?

Architecture generates a continuous experience in heterogeneous space, and according to Deleuze, there are only separate effects. Architecture based on geometry breaks with the economy of *mimesis* because it does not produce copies (icons) but models (simulacra), and thus does not repeat, but constitutes the order. In contemporary times, but only by losing the pretension to realise its own ideas about the world, it has the possibility of turning to creation of alternative world models.

Rather early, in the early twentieth century, Duchamp realised that the world cannot be repeated, but only represented, duplicated, negated or quoted, in the way characteristic of language mechanisms. His 'Large Glass' is a challenge of

perspectival ambiguity: optics, geometry, and mathematics lose their value of conceptual abstraction when they are used by the narrative. The Renaissance believed in the value of interpretation because the language formulated contents that were within space and time. What was visible was also fully comprehensible. Hence the justification for its condensation of reality.

A modern-day fragmented narrative has its historical parallel in uncontrolled exterior (literally and phenomenally) that only confirmed the internal architectural order. Triumph of the construction of rational perception of the domain of reality and an appropriate sense of it has always required acceptance of the disposition of true reality. As before, today it also seems more real than reality itself: anti-geometric experiment in which myth and discourse still persist together, turning into the other, and finding themselves in the other. The inability to imagine that mathematical sense in architecture can be expressed by means other than geometry originates from the fact, as Spengler argues, that the so-called written mathematics is identified with the broader view and cumulative thought of civilisation.

However, a sense that lies in the abstract basis of numbers could be realised sensorily in some other way, but never without a new instrument, never separated from technology, never without methodological uncertainty. In this way, we can observe the similarities and dynamics of the modern era with the Gothic and Mannerism. Incompleteness of form that is characteristic of every dynamic style only intensifies the impression of infinitely restless movement in which the balance is only temporary. This is the origin of modern affinity for incomplete, fragmentary, and only suggested.

In Mannerism, it is a matter of another kind of incompleteness that results in fragmentation of a geometric nature. Since that era, all great art has something fragmentary in itself, certain external and internal incompleteness, reluctance to say the last word. 'There is always something left over for the spectator or reader to complete. The modern artist shrinks from the last word because he feels the inadequacy of all words - a feeling which we may say was never experienced by man before Gothic times.'²⁴

Each form is the projection of another form according to a certain vanishing point and a certain distance (Fig. 3).

- Marcel Duchamp (Regions which are not ruled by time and space, TV interview by James Johnson Sweeney, January 1956)



Fig. 3. Trompe-L'Oeil, Final project, Life is a Dream (Calderon), Open air theatre, Natural core of Belgrade, Luka Grgić, (Tutors: Milenković, Ćuković Ignjatović, Milojević, University of Belgrade – the Faculty of Architecture, 2020)

Mannerism has been neglected, in a similar way to the Gothic, by the classical theory of architecture. Architecture that is based on a pure geometric idiom can only see irregularity in it. However, Mannerist architecture makes a real deviation from the Renaissance principle of completeness, closest to the one in contemporary architecture. Nouvel does it by repeating, with the curvature in one dimension – in which the anxiety that prevents direct relationship with things is released. Bofill uses oversizing to position the object in counterpoint to the landscape.

In a similar manner, Perrault attempts to control the internal content of architecture through geometry. Barragan questions the visibility of pure geometry using colour, including figuration as a necessary reference system. Manneristic collapsed perspective indicates the disappearance of rigid distance separating the present from the past and the future as well as the form from vague materiality. The metaphor becomes the main means of expression; open forms appear without structure. There is a tendency towards atectonic form, voidance of the volume, while construction tends to use attenuation to represent works as drafts, i.e., mental images.

Oliva interprets the tension in relation to integrity as an attempt to functionally express parts of the internal content. For him, to form means to block the movement completely and take away the tendency of object towards integrity – to use at the same time the possibility of a formal blockage in the metaphysical language space. In contemporary representation of architecture, transparency has withdrawn in favour of masks and scenography. Language is activated against the archetype, the inability of language to speak of itself except through

tautologies. In contemporary times, architectural position is achieved between the extremes of the metamaterial and the fragmentary – in broken geometry of form and the idea of form.

My work is dry in relation to technique (Fig. 4).

- Marcel Duchamp (Interview by Dorothy Norman, 1956)



Fig. 4. Centre for Image and Sound, Kosančićev venac, Belgrade, M1 Design studio, Kemal Hasanagić, (Tutors: Milenković, Mojsilović, University of Belgrade - the Faculty of Architecture, 2020)

ARCHITECTURE IN FRAGMENTS

Contemporary architecture rejects the idea of totality in terms of continuity and fluidity, turning to the fragmented experience of spatial gaps and its structured narratives. The narrative itself, which is included in the vague dialogue of spatial fragments, becomes a narrative of discontinuity. In terms of such discontinuity of both space and time, conditioned by the compression of distance and the speed of contemporary life, the sequences of future memory emerge, blurred and not rooted in space and time. If architecture still survives as a system of metaphors (as Derrida once argued), and as a form of writing and a form of life, fragmentation is a logical outcome of the idea of general in individual, irrespective of its elementary materiality and linguistic function. Literally, it is an intention visible in its wake. In Baudelaire's words, if the *universe is nothing but a store of images and signs*, it could be said that fragmentation is a new study of modernity. As always, there are technology, institutions, symbols, and forms of new representations based on the myth of the Tower of Babel, the Fall of Icarus, and the false Wizard of Oz, the inevitable deconstruction of integrity that is already known. Fragments become elements used for the

interpretation of reality - a radical critique of contemporary society - the genesis of multiple layers of perception and experience of the impossible. It could be said that architecture survives only if it negates the form that is expected of it. If it negates itself and transcends its own framework, architecture emerges as an expression of this deficiency, defect, incompleteness, always leaving something out, reality or concept. Relating to overlaps between images and narratives, layers of the appearance of architecture include the polyvalence of what the object really is, and what becomes as its reflection. Such overlaps lead to decomposition of objects, systemic dematerialisation and variability of its geometry. If the appearance of variability is free from pure spatial definition,²⁵ then variability can be understood as an intensification of experience.

Different forms of transformation of spatial categories, as defined by Deleuze long ago, are processes of constant becoming and they carry the idea of infinite potential as a model of survival of architecture and 'the right to new.' The differences still serve to conceptualize spatial categories in terms of their fragments and interpretations beyond confirmed formulations. If the duration is both the future and the form of its change defined by speed, transcendence, ease, and transition from one state to another, can it be said that architectural contemporaneity becomes the capacity of architecture to enable multivalent content in itself.²⁶ In this case, we renounce in advance the possibility of omnipresence of the concept of the world. Its textures in traces tend to exist autonomously, only in relation to one another, reaching the meaning that is always somewhere outside - beyond the material world we know, in a position from which the other is not only the visibility of potential, but also its reality

NOTES

- 1 Jeremy Till, *Architecture Depends* (The MIT Press, 2009), 55-61.
- 2 Sylvia Lavin, *Flash in the Pan* (Architectural Association Publications, 2015), 174.
- 3 Paul Rabinow, "Beyond Ethnography: Anthropology as Nominalism", *Cultural Anthropology* 3(4): 355-364. http://anthropos-lab.net/wp/publications/2009/10/fs_anthro_of_contemp.pdf
- 4 Guy Debord, *Society Of Spectacle* (Detroit: Black&Red, 1983), 7.
- 5 Wallace Stevens, *The Collected Poems of Wallace Stevens* (New York: Vintage Books, 1990), 86.
- 6 Gaston Bachelard, *The Poetics of Space* (Beacon Press, 1994), 137.
- 7 John Hendrix, *Theorizing A Contradiction Between Form And Function In Architecture* (Routledge, 2013), 166.
- 8 Renaud Barbaras, "Invisibility at the heart of appearance: on perception, art and desire" in *Paradoxes of Appearing: Essays on Art, Architecture and Philosophy*, ed. by Michael Asgaard Andersen (Lars Müller Publishers, 2009), 169-185.
- 9 Jean Baudrillard, *Why Hasn't Everything Already Disappeared?* (Seagull Books, 2009), 32.
- 10 Frederic Jameson, *Postmodernism or the Cultural Logic of Late Capitalism* (London: Verso, 1991), 18.
- 11 Paul Virilio, *War And Cinema* (London: Verso, 1994), 33.
- 12 Jelena Mitrović and Vladimir Milenković, "Arhitektura kupole: mapiranje nebeske dubine." *Theoria* 1, no 63. (2017): 163-175. <http://www.doiserbia.nb.rs/img/doi/0351-2274/2017/0351-22741701163M.pdf>.
- 13 John Berger, *The Ways of Seing* (Penguin, 1992), 5.
- 14 In: "O slikarskoj perspektivi" (*De Prospectiva Pingendi*, c1474), Piero della Francesca
- 15 We refer here primarily to the fresco 'Holy Trinity' located in the in the Dominican church of Santa Maria Novella in Florence, dating from 1427, shortly before the artist died.
- 16 Erwin Panofsky, *Rasprave o osnovnim pitanjima nauke o umetnosti* (Bogovađa: Samostalno izdanje, 1999), 144-180.
- 17 Tahl Kaminer, *Architecture, Crisis and Resuscitation: The Reproduction of Post-Fordism in Late-Twentieth-Century Architecture* (Routledge, 2011).
- 18 Erwin Panofsky, *Rasprave o osnovnim pitanjima nauke o umetnosti* (Bogovađa: Samostalno izdanje, 1999), 144-180.
- 19 Erwin Panofsky, *Rasprave o osnovnim pitanjima nauke o umetnosti* (Bogovađa: Samostalno izdanje, 1999), 146.
- 20 Tahl Kaminer, *Architecture, Crisis and Resuscitation: The Reproduction of Post-Fordism in Late-Twentieth-Century Architecture*. (Routledge, 2011).
- 21 Erwin Panofsky, *Rasprave o osnovnim pitanjima nauke o umetnosti* (Bogovađa: Samostalno izdanje, 1999), 144-180.

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- 22 Ibid.
- 23 Fridrih Niče, *Volja za moć* (Dereta, 2012).
- 24 Arnold Hauzer, *Socijalna istorija umetnosti* (Beograd: Kultura, 1966), 224-226
- 25 Vladimir Milenković, *Arhitektonska forma i multi-funkcija* (Beograd: Zadužbina Andrejević, 2004), 15.
- 26 Hans Ibelings, *Supermodernism: Architecture in the Age of Globalization*. (NAi Publishers, 1998), 9.

BIBLIOGRAPHY

- Bachelard, Gaston. *The Poetics of Space*. Beacon Press, 1994.
- Baudrillard, Jean. *Why Hasn't Everything Already Disappeared?* Seagull Books, 2009.
- Barbaras, Renaud. "Invisibility at the heart of appearance: on perception, art and desire." In: *Paradoxes of Appearing: Essays on Art, Architecture and Philosophy*, ed. by Michael Asgaard Andersen, 169-185.
- Bergson, Anri. *Materija i pamćenje*. Fedon, 2013.
- Bourriaud, Nicolas. *Formes de vie. L'art moderne et l'invention de soi*. Denoël, 2009.
- Bourriaud, Nicolas. *L'exforme*. Presses universitaires de France - PUF, 2017.
- Delez, Žil. *Razlika i ponavljanje*. Beograd: Fedon, 2009.
- Gavrić, Zoran and Bjelić, Branislava, ed. *Marcel Duchamp: Spisi – Tumačenja*. Samizdat Bogovađa, 1995.
- Hauzer, Arnold. *Socijalna istorija umetnosti*. Kultura, 1966.
- Hendrix, John. *Theorizing a contradiction between form and function in architecture*. Routledge, 2013.
- Ibelings, Hans. *Supermodernism: Architecture in the Age of Globalization*. NAI Publishers, 1998.
- Jameson, Fredric. *Postmodernism or the Cultural Logic of Late Capitalism*. London: Verso, 1991.
- Kaminer, Tahl. *Architecture, Crisis and Resuscitation: The Reproduction of Post-Fordism in Late-Twentieth-Century Architecture*. Routledge, 2011.
- Latur, Bruno. *Nikada nismo bili moderni*. Mediterran Publishing, 2010.
- Lavin, Sylvia. *Flash in the Pan*. Architectural Association Publications, 2015.
- Milenković, Vladimir. *Arhitektonska forma i multi-funkcija*. Beograd: Zadužbina Andrejević, 2004.
- Mitrović, Jelena and Milenković, Vladimir. "Arhitektura kupole: mapiranje nebeske dubine." *Theoria* 1, no 63. (2017): 163–175. <http://www.doiserbia.nb.rs/img/doi/0351-2274/2017/0351-22741701163M.pdf>.
- Niče, Fridrih. *Volja za moć*. Dereta, 2012.
- Oliva, Akile Bonito. *Ideologija izdajnika*. Svetovi, 1989.
- Oliva, Akile Bonito. A.B.O.M.D., Svetovi, 1977.
- Panofsky, Erwin. *Rasprave o osnovnim pitanjima nauke o umetnosti*. Bogovađa: Samostalno izdanje, 1999.
- Rabinow, Paul. "Beyond Ethnography: Anthropology as Nominalism." *Cultural Anthropology*, no.1 (2009): 355-364.
- Renaud Barbaras, "Invisibility at the heart of appearance: on perception, art and desire," 169-185. In *Paradoxes of Appearing: Essays on Art, Architecture and Philosophy*. Ed. by Michael Asgaard Andersen. Lars Müller Publishers, 2009.

-
- Stevens, Wallace. *The Collected Poems of Wallace Stevens*. New York: Vintage Books, 1990.
- Till, Jeremy. *Architecture Depends*. The MIT Press, 2009.
- Vignjević, Ana. Metamaterijalnost: arhitektura i pejzažni kod. Doktorska disertacija. Univerzitet u Beogradu - Arhitektonski fakultet. 2016.
- Virilio, Paul. *War and Cinema*. London: Verso, 1994.
- Wingham, Ivana. *Mobility of the Line: Art Architecture Design*. Birkhauser Verlag AG, 2013.
- Ricoeur, Paul. "Architecture and narrativity." Translated by Eileen Brennan, Robbie Carney and Samuel Lelièvre. *Études Ricoeuriennes / Ricoeur Studies* 7, no. 2 (2016): 31-42.
- Ricoeur, Paul. *Memory, History, Forgetting*. Translated by Kathleen Blamey and David Pellauer. Chicago: University of Chicago Press, 2004.

GEOMETRIJSKI ISKORAK U SAVREMENOM ARHITEKTONSKOM DIZAJNU:
METAMATERIJALNOST I FRAGMENTACIJA

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Studija povezuje dve istorijske kategorije koje ranije nisu bile povezane na ovaj način. Jedna se tiče uloge geometrije u transformaciji prostora u gotici, gde je geometrijska linija prvi put učinila vidljivim položaj fizičkih sila. Druga transformacija koja oslobađa anksioznost u osporavanju perspektive učinjena je u manirizmu instrumentalizacijom metafore pomoću vizuelnih sredstava deformacije i figuracije. Danas oba istorijska momenta doživljavamo u modifikovanom pojavnom obliku, i dalje pokušavajući da pitanju materijalnosti damo formalni karakter. Kako to nije moguće, ovaj pristup je rezultirao fragmentacijom u odsustvu jedinstvene radikalne kritike modernosti. Fragmentacija i metamaterijalnost savremene arhitekture danas predstavljaju moguću konceptualizaciju prostora, pozivajući se na sve poznate oblike dematerijalizacije i nestajanja sveta, uključujući i digitalizaciju. Pozivajući se još jednom na mit o Vavilonskoj kuli, Ikarovom padu i Čarobnjaku iz Oza, mit i diskurs opstaju zajedno u ovom eksperimentu, pretvarajući se u drugog i nalazeći sebe u drugom. Izgradnja arhitektonske pozicije između ekstrema metamaterijalnog i fragmentarnog je stvar razbijanja geometrije forme i ideje o njoj.

KLJUČNE REČI: FORMA, GEOMETRIJA, MATERIJALNOST, META-MATERIJALNOST, NEDOVRŠENOST,
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