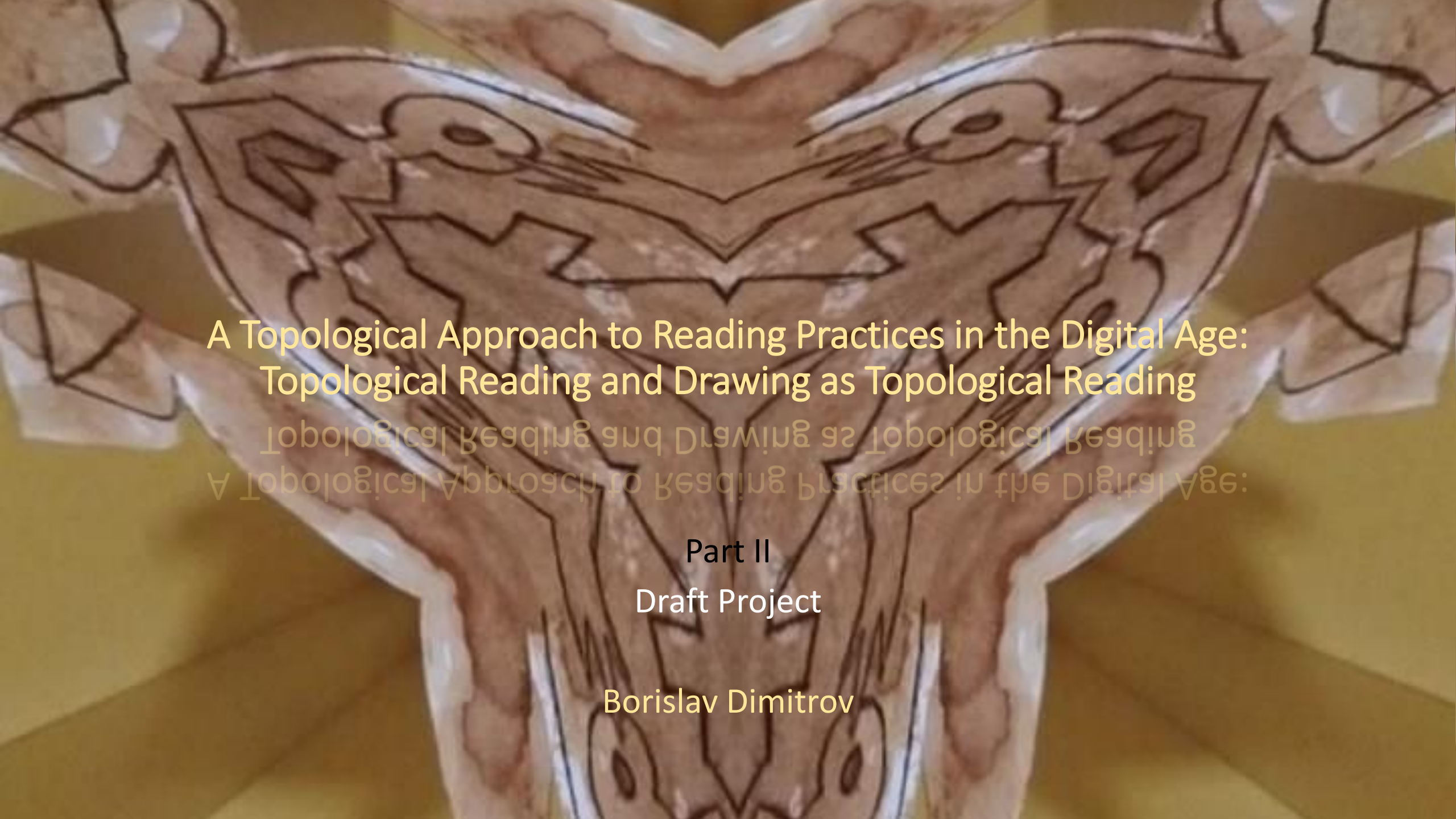


A Topological Approach to Reading Practices in the Digital Age: Topological Reading and Drawing as Topological Reading

Part II

Draft Project

Borislav Dimitrov

Topological Reading and Drawing as Topological Reading

“if topology is defined as the study of those qualitative properties which are invariant under isomorphic transformation, this is exactly what we did in structural linguistics”

Roman Jakobson, Antropology Today, p.311

Topological Reading and Drawing as Topological Reading

“Influence” is no longer the relevant metaphor: we are dealing not with inflow but homeomorphism, the domain of topology, systems of identical interconnectedness. Thus Joyce discerned homeomorphic structures in the Odyssey, Hamlet, Don Giovanni, The Count of Monte Cristo, and his own life. This suggests a grammar of generative plots.”

Hugh Kenner, “The Pound Era”

The concept of ‘literary topos”

The concept of ‘literary topos”

The presence of ‘topology’ in philology and literature is strong in the historical tradition and our currents, first derived from rhetorical notion of ‘topos’ and later directly linked with topology as mathematical discipline.

The concept of ‘literary topos”

In 1948 **Ernst Robert Curtius** (1886 – 1956), German literary scholar, philologist, and Romance language literary critic, published his study Europäische Literatur und Lateinisches Mittelalter, translated in English as European Literature and the Latin Middle Ages.

With his study Curtius introduced the concept of ‘literary topos” as scholarly and critical discussion of literary commonplaces, claiming that much of Renaissance and later European literature cannot be fully understood without knowledge of that literature's relation to Medieval Latin rhetoric in the use of commonplaces, metaphors, turns of phrase, or, to employ the term Curtius prefers, topoi". (Lind, L.R. (1951). "Rev. of Curtius, Europäische Literatur und lateinisches Mittelalter". The Classical Weekly 44 (14): 220–21.)

The concept of ‘literary topos”

Klaus Ostheeren in his study on Curtius (Ostheeren, K., 1998), establishes that “Topological studies in various branches of knowledge, such as law, go back to this original meaning…but literary topology is firmly based on Curtius’s metonymic use of “topos”, wich some scholars traced back to Aristotle. Inaugurating modern topology as a method for historical, cultural and literary research, Curtius transformed the inherited conception of from technique of finding arguments in rhetorical persuasion into the patterns of thought and expression originally found by applying this technique, but now established as inherited and aquitened constituents of literary competence – the indispensable cognitive units and literary production, reception, and interpretation.” (Ostheeren, K., 199, p.373).

Curtius’s rhetorical modes of thought and expression crystalize into patterns or models wich he called topoi, their study being “topological research” or “topology” (toposforshung). Curtius practiced this branch of topology, synchronic or syntagmatic topology, with brilliant results in studies of Divine Comedy.

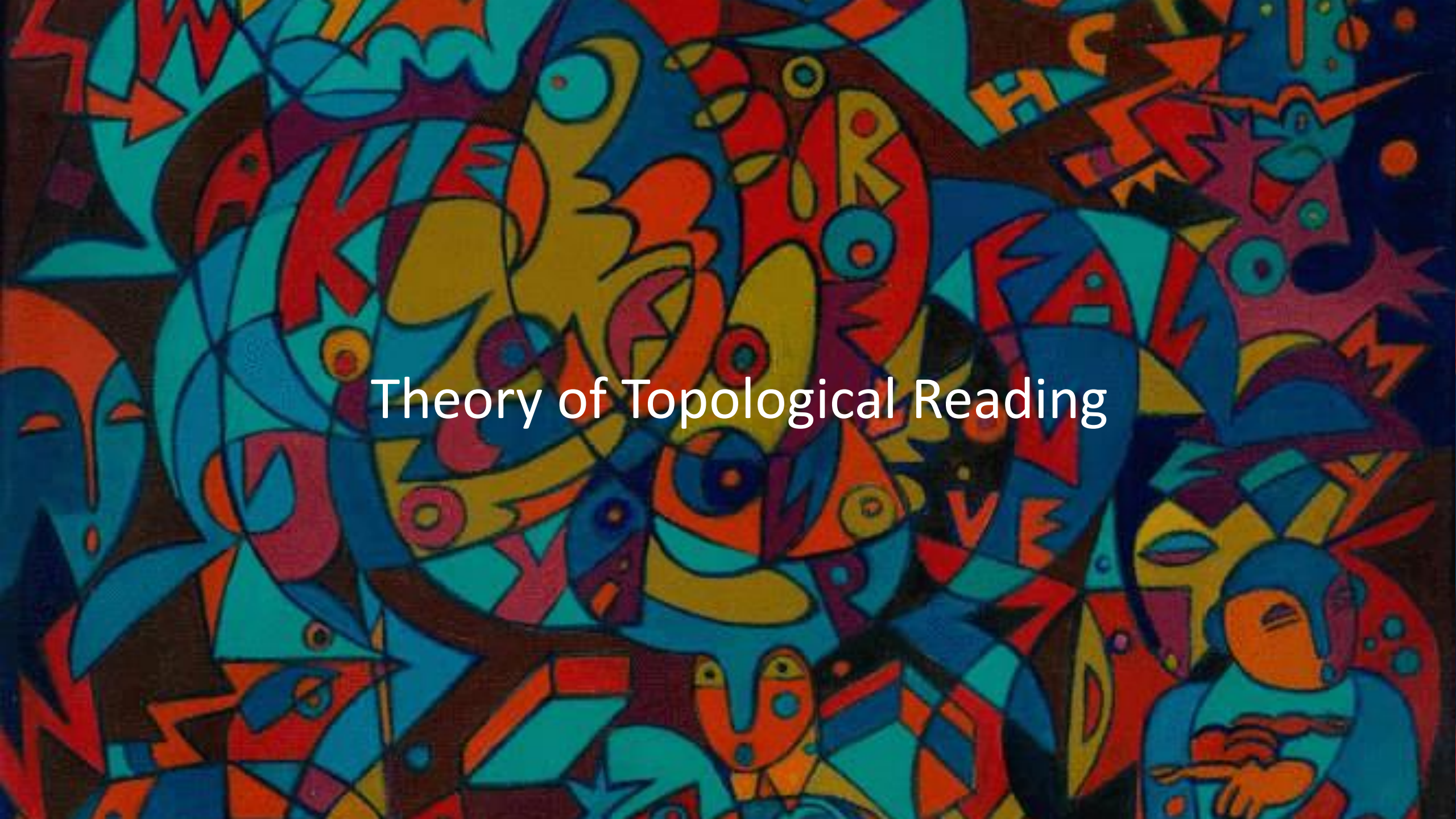
The concept of ‘literary topos”

The importance of Curtius’s rediscovery of topoi and topics extended beyond the medieval studies. In philosophy, sociology, political science, and jurisprudence topology has come to be regarded as a bridge over the historical gap that opened in the eighteenth century Europe, when – for not yet fully understood – topic gave way to logical thinking. (Gelley, A. 1974).

The concept of ‘literary topos”

The links between the Curtius’s ‘literary topology’ and mathematical concepts, similar to the modern topology as mathematical discipline, are not disputable.

Mark A. Paterson in his book Galileo's Muse: Renaissance Mathematics and the Arts, asserts that “the branch of mathematics that deals with spaces like this, spaces that are different from space that we visualize most easily, is called topology. In visualizing a new three-dimensional space, finite but having No edge, Dante has invented a new topological space, the 3-sphere. If this imaginative feat had been recognized in his own time, and if the idea had been pursued and developed, Dante would today be considered one of the inventors of topology, and one of the great creative mathematicians of all time. As it is, he is not even a footnote to topology, which was only invented officially in the eighteenth century, and didn’t really take off until the twentieth.” (Peterson, M., 2011)



Theory of Topological Reading

the ‘topological turn’ in Literary Theory and Textual Analysis and ‘digital humanities”

The spatial turn and ‘topological turn’ in Literary Theory and Textual Analysis (Ernest W. B. Hess-Lüttich, W.B. E. 2012) is associated with the development of linguistics and structuralism.

Topological thinking is presented in the studies of the Russian structuralist Vladimir Propp, in his analysis of Russian folk tales, where Propp identifies 31 constitutive elements.

Levi-Strauss, who has reintroduced the concept of transformation independently and developed it further, refers to Propp in his essay Structure and Form: Reflections on a Work by Vladimir Propp, (1983).

Topology is presented in semiotics of Jurij M. Lotman, in study of the symbolic space in literature as a result of culturally determined sign utilisations.

- Ernest W. B. Hess-Lüttich, (2012) Spatial turn: On the Concept of Space in Cultural Geography and Literary Theory, (Vol. 5; 2012) Journal for Theoretical Cartography (Ernest W. B. Hess-Lüttich, 2012)

Theory of Topological Reading

In contemporary research of the so called ‘digital humanities’, topology is used as a means of modeling linguistic patterns to understand the spatial connectivity of literary texts. One of the best examples in this approach is **Andrew Piper**’s ‘theory of Topological Reading’ (Piper, A. 2013), and his ‘literary topologies’.

According to Piper, “..reading topologically alters our visual and cognitive relationship to the text, it also enables us to reconsider the place of conversion within reading as one of reading’s most historically prominent emotional and affective ideals (as well conversion’s secular correlate, the history of transgressive reading).”

For Piper “..topology moves us beyond our long held convictions of the palpable, the transformational, and the excessive when it comes to reading—the way reading moves us deeply, profoundly, and immeasurably—and toward the likely, the proximate, and the scalar. It moves us from a state of revolution to one of resolution, where reading’s affections and attachments are reinscribed within a perspectival, literaive system.

Conversion (or transgression) no longer serves in an electronic milieu as reading’s primary spiritual outcome, but instead as a theoretical initiation. Translation, a change of state, becomes the condition of topological reading rather than its end. (Piper. A., 2013, p.337)

the “quantitative history of literature”

Franco Moretti, director of Stanford Literary Lab, presented the idea of Literary Evolution.

Within the discipline of ‘digital humanities’, Moretti created the “quantitative history of literature”. In his book Graphs, Maps, Trees: Abstract Models for a Literary History (2005), Morettti used a quantitative approach to the study of literature that includes historical and comparative contexts and charts a cultural geography for literary genres.

Moretti’s other books include Signs Taken for Wonders (1983), Modern Epic (1995) and Atlas of the European Novel 1800-1900 (1998).

Moretti is at work on a five-volume collaborative study of the novel throughout all history and in all forms. In his triptych published in New Left Review —‘Graphs’, ‘Maps’ and ‘Trees’, with subtitle ‘Abstract Models for Literary History’, published later as book, Moretti offers intriguing and innovative approach based on the quantitative history, geography and evolutionary biology.

In his essay „On Literary Evolution”, Moretti uses evolution as a metaphor, linking evolutionary model with this of Darvin. Moretti ended his essay „Maps” with the quotation from D’Arcy Wentworth Thompson’s On Growth and Form: “We rise from a conception of form to an understanding of the forces which gave rise to it [. . .] and in the comparison of kindred forms [. . .] we discern the magnitude and the direction of the forces which we have sufficed to convert the one form into the other”. (Thompson, D’Arcy Wentworth. On Growth and Form. Macmillan, 1943.)

In his last part from the triptych ‘Trees’, Moretti discusses the morphological tree of evolution. He claims that the evolutionary bibliography could be understood as prototype evolutionary science and to think biology in the terms of bibliorgraphy. For Moretti the philogenesis is the base of bibliogenesis.

Becoming topological in vision

Inaugurating modern topology as a method for historical, cultural and literary research, as well as visual art research is grounded on the claim that our visual system is sensitive to global topological properties.

The extraction of global topological properties is a basic factor in perceptual organization and the perception of topological properties has the potential to serve as a unifying principle for visual functional lateralization.

Topological properties are in fact primitive properties of object perception.

As **Lin Chen** established “the topological property of the visual image represents the primary element and is the first to be perceived in form perception.” (Chen, L. 1982), (Chen, L. 2000) .

Evidence for topological perception has long been supported by human visual psychophysical studies of visual sensitivity. (Chen, L. 1982) , also (Lewin, K. 1936) , (Warren McCulloch, W. 1945) , (Piaget, J. & Inhelder, B. 1956), (Piaget J., Inhalder, B. 1958), (Piaget, J., Inhalder, B. 1967) , (Smith, B 1994) , (Rees, J.M. 2010) .

According to Chen, the topological perception constitutes an important element in visual perception and further brain-imaging studies. In addition, Lin Chen’s theory states that the primitives of visual form perception are geometric invariants at different levels of structural stability under transformations. Thus, a more stable property would be more primitive and more important to extract early in the process.

Topological properties are the most stable in relation to other geometrical properties such as projective, affine, and Euclidean properties. In the recent research, Lin Chen and colleagues reported schematic depiction of the left hemisphere's superiority in topological discrimination. (Chen, L. 1982), (Chen, L. 2005), (Chen, L., Zhang, S.W., Srinivasan, M. V. (2003) , (Casati, R. 2000) , (Donnelly, N. 2005) ,, (Smith, P. 2011) .

the deepest core of the human imagination is topological

Peter Murphy asserts that the deepest core of the human imagination is topological, and the human beings see, think and feel 'topologically‘.

Topology is the medium of human creation. Topology allows us to melt distinct figures of forms, shapes, images and thought. (Murphy, P. (2014).

Topology and Topological thinking as tool for creating of meaning is in critical importance for both the reader and the visual artist, allowing him or her to imply in art work the mental act of making equivalence (the same) things that are different or even opposed.

Topology as a mathematical representation of continuity, is the study of constancy in change, the study of the intensive identity of change and not-change. Topology is the study of shapes and place(s) that change and yet through change remain continuous with each other. These shapes and spaces remain connected to each other without breach. Even though they look different, under the surface of appearance they maintain unbroaken an identity with each other. (Murphy, P. (2014)

the deepest core of the human imagination is topological

Topology equates transformation and invariance, alteration and permanence, renovation and solidity, stability, longevity and immovability are indistinguishable from modification, adjustment and variation. (Murphy, P. (2014)

- Peter Murphy, Topeme: Truth. Topology. Cartography, Analogy., The Hydra Dialogues, May 22-23 2014, The Royal Danish Academy of Fine Arts, School of Architecture, Design and Conversation.

Topology and Drawing systems

John Willats asserts that the “drawing systems are systems that map spatial relations between features of scene into corresponding relations on the picture surface”. (Willats, J. 1997) . Within the known type of drawing systems in evolution of culture and art, the drawing system described as ‘primary geometrical’, such as the ‘perspective’; ‘oblique projection’ (commonly used in Hellenistic art, Mediavel art, Persian miniature painting and Chinese art); ‘otragonal projection’ (the basis for most Greek vase paintings, and now utilized in engineering and architectural drawings); ‘horizontal oblique projection’ (typical for naïve American landscape and icon painting); ‘vertical oblique projection’ (Indian painting, Cubist still life paintings), there are drawing systems can also be defined in terms of “secondary geometries”. (Willats, J. 1997) .

Willats, John (1997). Art and Representation: New Principles in the Analysis of Pictures. Princeton University Press, Princeton;

Willats, John (2005), *Making Sense of Children’s Drawings*, Mahwah, NJ,;

Willats, John and Durand, Frédo (2005) Defining pictorial style: Lessons from linguistics and computer graphics’, *Axiomathes*, 15: 3, September 2005;

Willats, John (1997). Art and Representation: New Principles in the Analysis of Pictures. Princeton University Press, Princeton

Topology and Drawing systems

In addition to these known two dimensional geometry of the picture surface - the geometry of the ‘ortagonals of the rectangular objects’ and the ‘oblique projections of the ortagonals’, there are also two further systems that can be defined in terms of secondary geometry. The first, Willats call the ‘inverted or diverted perspective’ (found in icon painting and some Cubist paintings), in which the ortagonals diverge, and the second, and “in some way the more important, is based on topological geometry” found in Children early drawings. (Willats, J. 1997).

In “Art and representation in the Analysis of pictures”, Chapter III, Topological transformation, (Willats, J. 1997, p.71) , Willats states that “In addition to the defining the spatial relations in pictures in term of projective geometry, the other main way of defining the drawing systems is in term of topological transformations.

Topology is often described as “rubber sheet” geometry if a figure printed on the sheet is stretched or twisted, basic spatial relations such as proximity and enclosure will remain unchanged, although the distances between the marks may change and strait lines may not remain straight. These very basic spatial reflections form the subject of topological geometry. Figures or shapes are said to be topologically equivalent (‘homeomorfic’) if they share the same topological properties.

For example a circle and a square are topologically equivalent because in both figures the outline is closed and separates the inside of the figures from the outside in two-dimensional space. Singularly, a closed box and a halbow rubber ball are topologically equivalent because the surface of each separates the inside of the sphere from the outside in three-dimensional space.” (Willats, J. 1997, p.71)

Topology and Drawing systems

The relevance of the proposed with the present research project and works - ‘topological approach’ to drawing is highlighted by Willats’s statement – “There is an extensive literature on projective geometry as a basis from depiction, but although same pictures, such as the map of the London underground clearly preserve topological properties rather than projective properties. I know of no formal account of topology as applied to pictorial representation. In pictures of this kind, spatial relations in the the seize sich as as spatial order, proximity, and interconnectedness are preserved in the picture, but not true shapes or true lengths.” (Willats, J. 1997, p.71).

In addition, Willats recall that “Piaget and Inhelder suggested that the spatial relations in drawing of young children are based on topological rather than projective geometry, and I shall suggests that the spatial relations in some artists’ pictures, such as same of Klee’s drawings, as well as many cartoons and caricatures, can also be described in term of topological geometry. In pictures topological relationships in the scene are represented by topological equivalent relations of the picture surface.” (Willats, J. 1997, p.71).


Child's notion about space is topological

Child's notion about space is topological

Research by Piaget and Inhelder (1956, 1960) suggest that early spatial conceptions are topological in nature.

These basic topological ideas are very general and inclusive, and so give an infant a very broad understanding of his/her spatial world that can be refined with more detailed and complex perceptions.

These perceptions can be described through the features of various types of geometry. The observations gathered by Piaget and Inhelder led them to propose four stages of development in spatial thinking.

Child's notion about space is topological

The four basic topological concepts are as follows:

- Proximity - the relative nearness of an object or event to any other object or event.

- Order - the sequence of objects or events (in time) according to size, colour or some other attribute. For example, if three toys are suspended in a line over a crib long enough for an infant to become familiar with them, he/she will notice if the sequence of the toys is changed.

- Separation - an object, event or 'space' coming between other objects or events. It also involves distinguishing between objects and parts of objects.

- Enclosure - an object or event surrounded by other objects or events, which involves the ideas of inside, outside and between.

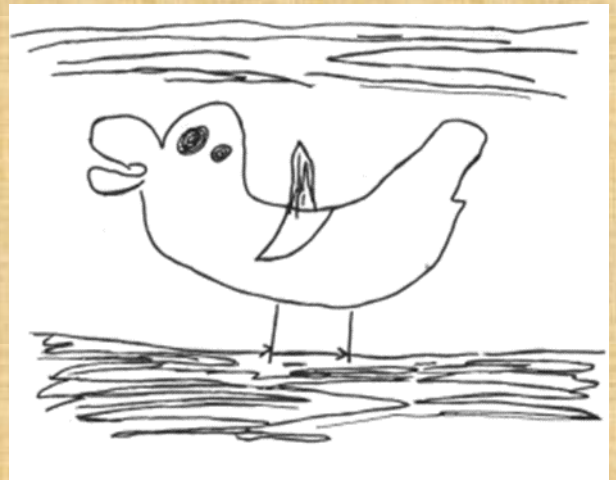
Child's notion about space is topological

- Pre-operational Stage 2-7 years

Children begin to represent spatial features through drawing and modelling. Their topological thinking is evident in their drawings. For example, in the drawing of a duck below, done by a five-year-old, the sky and the ground are represented as separate objects - there is no comprehension of the horizon. Both eyes are drawn on one side of the head because, to the child, the important feature is that they are inside (enclosed within) the head shape (McNally, p.29). As is typical around this age, the child does not yet possess the type of thinking that can be described by Projective Geometry, and which would allow him/her to imagine the other side of the duck.

Child's notion about space is topological

- Pre-operational Stage 2-7 years



Child's notion about space is topological

- **Concrete Operational Stage 7-12 years**

Gradually, between the ages of about 4 and 9 years, the child begins to perceive and represent objects from different points of view and incorporates ideas of perspective. The placement of features or objects in relation to each other and taking account of vertical and horizontal relationships becomes part of the child's way of viewing the world. These sorts of ideas can be classified as belonging to the type of geometry called Projective Geometry. In the drawing of 'Dogs playing soccer', done by a 7 year old, evidence of this type of thinking can be found. When asked why the dogs had only one eye she replied, "The other one's on the other side but we can't see it". When questioned about the numbers of legs drawn for each dog, she explained that the dogs on the left were running so we could see all their legs, but the dog on the right was standing still so two legs were hidden from view (the third appendage is a tail!).

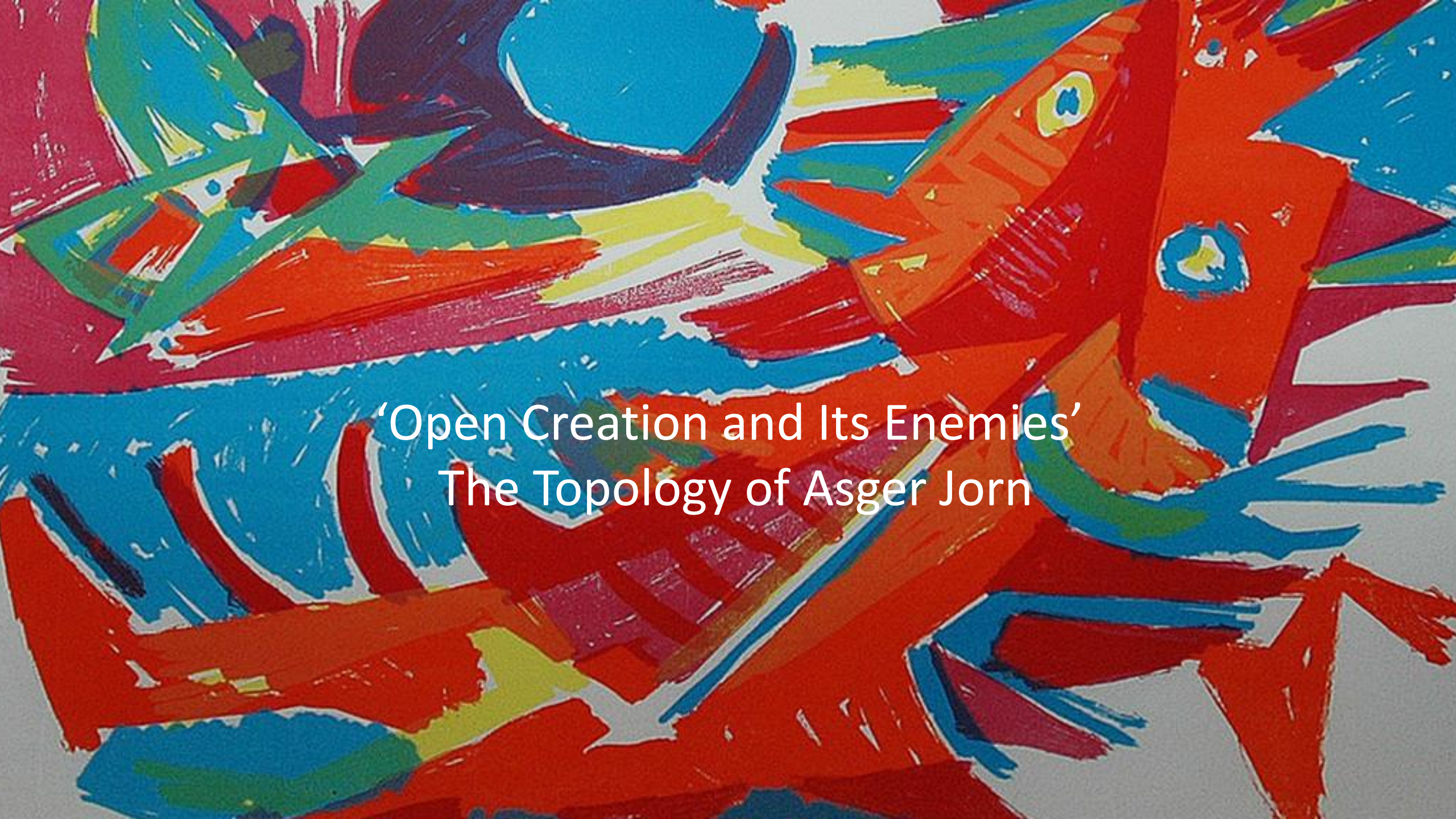
Child's notion about space is topological

- Concrete Operational Stage 7-12 years

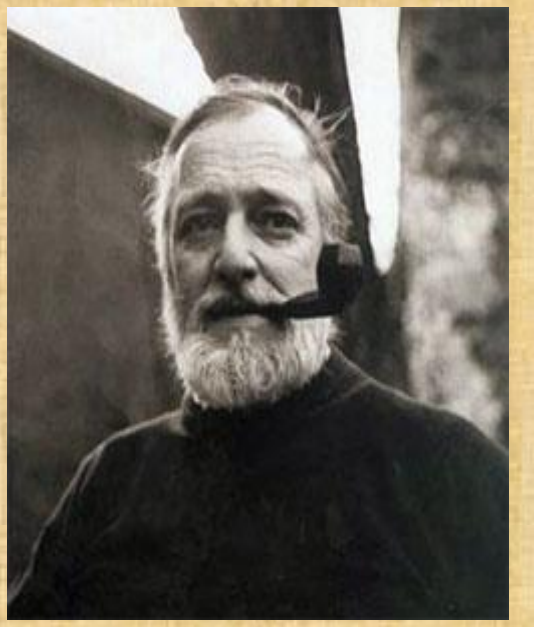
Child's notion about space is topological

- While Piaget and Inhelder suggest that the development of perception as described by the types of geometry are sequential (i.e. Topological, Projective, Euclidean), other researchers believe that all types of geometric thinking continue to develop over time and become increasingly integrated.

- Piaget, J. and Inhelder, B. (1967). The Child's Conception of Space. New York: Norton.Piaget, J., Inhelder, B. and Szeminski, A. (1960).


‘Open Creation and Its Enemies’
The Topology of Asger Jorn

Asger Jorn (3 March 1914 – 1 May 1973) was a Danish painter, sculptor, ceramic artist, and author. He was a founding member of the avant-garde movement COBRA and the Situationist International. In 1954 he met Guy Debord, who was to become a close friend. The two men collaborated on two artist's books, Fin de Copenhagen (1957) and Memories (1959), along with prints, and forewords to each other's work. Jorn participated in the conference that led to the merger of the International Movements for an Imaginist Bauhaus, the Lettriste Internationale, and London Psychogeograhical Association to form the Situationist International in 1957. Jorn applied his scientific and mathematical knowledge drawn from Henri Poincare and Niels Bohr to develop his situlogical technique.



The Topology of Asger Jorn

The most advanced attempt to construct a situationist topology was certainly that developed by Asger Jorn in his writings, paired with the groundbreaking experiments of the Scandinavian branch of Situationism in the Situationist Times magazine edited by Jacqueline de Jong.

Jorn was one of the few Situationists actively engaged in defining what a situation actually is. He does so through a development of Situlogy, a practice based on the mathematical field of topology which he begun to explore in the mid-1950s.

The Topology of Asger Jorn

In a text called ‘Open Creation and Its Enemies’ published in the fifth edition of the Internationale Situationniste journal in 1960, Jorn links the Situationist movement to topology as it was originally conceptualized by mathematician Henri Poincaré under the name Analysis Situs.”

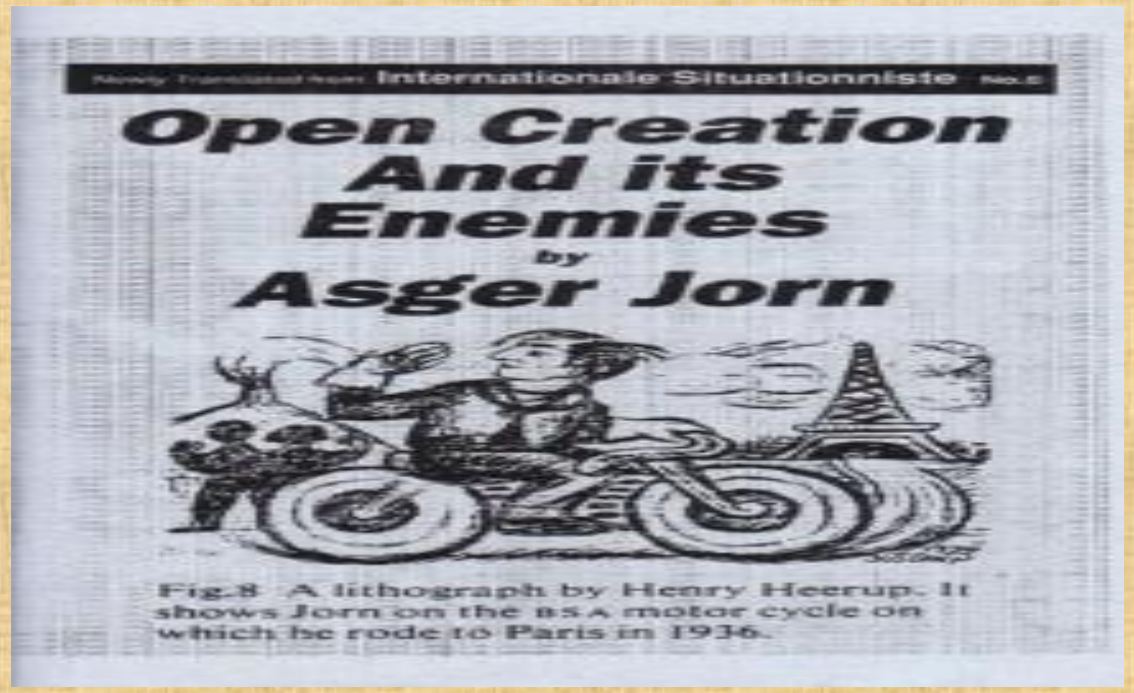


Fig.8 A lithograph by Henry Heerup. It shows Jorn on the BSA motor cycle on which he rode to Paris in 1936.

The Topology of Asger Jorn

According to Jorn, Euclidean geometry is a dead end because it is concerned solely with defining rigid limits of static space, in which time and the observer are absent.

Jorn suggests to ‘set a plastic and elementary geometry against egalitarian and Euclidean geometry, and with the help of both to go towards a geometry of variables, playful and differential’.

Situlogy builds on topology’s theory of equivalence (a sphere is equivalent to a cube, a torus to a cup of coffee, etc.) and completes it by incorporating the transformative dimension of time. It is a tool to study ambiences by applying topological concepts such as morphological equivalence and continuity to certain spaces and forms, but restricting the scope of study to unitary blocks of time and acknowledging that a particular topography is valid within a chronological unit but perhaps not in another.

This is what led Jorn to declare that ‘situlogy is the transformative morphology of the unique’.

The Topology of Asger Jorn

In a sense, by theorizing the situation as a deformable block of space-time, Jorn anticipates a whole branch of performance art based on a practice of the event, coined relational aesthetics three decades later by Nicolas Bourriaud (1998).

Jorn defines the situation more precisely as an entanglement of subjectivity and objective space: 'Situation, overlapping: Two or more situations which exist simultaneously and which have a common part. The person is generally located within this common part' (1963 cited in Wark, 2011, p. 120).

He goes on by outlining topological properties of situations: regions of space-time that can be characterized according to their morphological differentiation and the degree of connection between sub-regions, and appropriated by the subject following relations of continuity rather than boundary. Situlogical practice can thus be conceived as an intervention in the flow of time seeking to isolate a region of space-time and construct a local ontology of the event. It is about dissolving art in everyday life, in life spaces devoted to playing.

The Topology of Asger Jorn

Arguing with Maurice Lemaitre, in his article Open Creation And Its Enemies, Jorn discusses ‘the formula of orientability’.

Jorn quotes E.M. Patterson, the topologist who explains in Jorn’s text, that "the idea of orientablity derives from the physical idea that a surface could have one or two sides. Let us suppose that around each point of a surface - with the exception of the points at the edge (boundary), if there are any - a little closed curve is drawn in a defined sense, whether in the sense of rotation of the hands of a watch or in the contrary sense, having been attached to this point. At this moment, the surface is called orientable if it is possible to choose the sense of the curves, of the manner to which it would be the same for all the points sufficiently close to each other. If not the surface is called non-orientable. All surfaces with only one side are non-orientable."

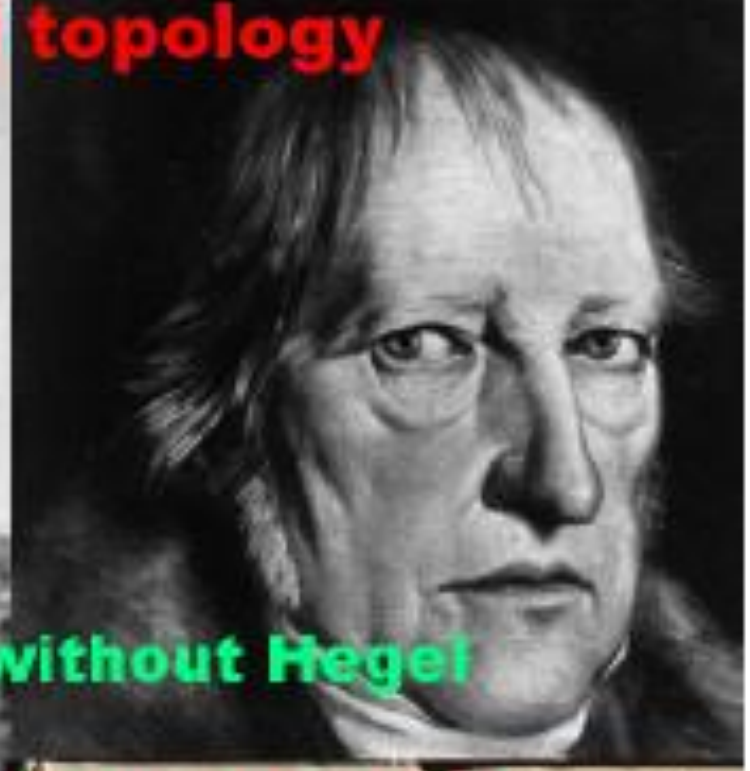
The Topology of Asger Jorn

In ‘Open Creation and Its Enemies’, Jorn introduced the topological homeomorphism :

“what allows the linkage of topology with the general tendency of geometry: the search for equalities, or equivalencies. Two figures are explained as being topologically equivalent, or homeomorph, if each can be transformed into the other by a continuous deformation. This is to say that there is a single figure in transformation”.

Here, Jorn concludes this paragraph with his famous claim that “situlogy is the transformative morphology of the unique.” This claim is not only an artist’s statement, but deep philosophical claim, drawing the main title of Asger Jorn’ life world’s quest, the true state of art of philosophical topology .

verbivicovisual topology



Joyce without Hegel and Vico without Hegel

"Vico's tetrad" constructed by Plato, Tacitus, Bacon and Grotius

JOYCE

TOPOLOGICAL

FW

Donald Phillip Verene 'tetrad'

Hegel, Cassirer, Vico and Joyce

BORISLAV DIMITROV, LL.M, PhD

Borislav Dimitrov is Visual Artist, Philosopher and Lawyer

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https://ariadnetopology.academia.edu/borislavdimitrov

Boris is a lawyer and visual artist, who completed his PhD thesis in philosophy (2016) – 'Topological (in) Hegel', within the PhD Program in Philosophy Taught in English, Faculty of Philosophy, Sofia University "St. Kliment Ohridski", Bulgaria.

He was a Visiting PhD Researcher at Faculty of Social Science, Lund University, Sweden (2014/2015), contributing with lectures on Philosophy of Science for Social Science, introducing his own curriculum on Applied Topological Philosophy and Topological Approaches to Law and Auditing, Phenomenology of Knowledge Spaces, Theory of Knowledge Spaces, and Visualization of Knowledge, Topological Data Analysis.

In 2015, he served as E-Discovery, Document Review Lawyer with Epiq Systems UK, JP Scrafton, and the Institute of Revenues Rating and Valuation (IRRV), London, UK. Borislav has professional interest and well established professional contacts in bitcoin/blockchain applications (decentralized models of communication, market, economy, and law, based on the cryptography) such as smart contracts, crypto law, blockchain application in law and auditing, including IP protection and notary services.

The sources of his artistic influence are literature, philosophy, topological philosophies and topological thinking.

Boris is influenced by Hugh Kenner's claim ("The Pound Era"), that: "Influence" is no longer the relevant metaphor: we are dealing not with inflow but homeomorphism, the domain of topology, systems of identical interconnectedness."

Boris's main project "Icon-o-graphing in visual fable James Joyce' novel "Finnegans Wake" (1999-2014), is in the center of his recent project 'Metalepsis: Topologically Speaking, Seeing, Thinking and Drawing'. He started this project back in 1999 in Toronto, Canada, with few solo art exhibits, and continued the work in Sofia, Bulgaria and Lund, Sweden.

The rest of Boris's art work series includes the artifacts of consciousness, myths and literature, related with the cultural phenomenology of literature like: Orpheus -The Thrace Fabulous (Thracian Orphism), The Epic of Gilgamesh, The Legend of the Golem, Franz Kafka, Samuel Beckett, Hopscotch /Rayuela/ of Julio Cortazar, Vladimir Nabokov, Thomas Pynchon, Herman Melville's Moby Dick, Jonathan Swift…

In addition Boris is interested in blockchain and art relation. With the use of blockchain platforms such as Ascribe and Artbyte (https://www.artbyte.me/members/boriswake/), he introduces limited digital editions of his artwork and paintings embedded in QR/AR Codes, each one with a unique ID and a digital Certificate of Authenticity (COA) to prove provenance and authenticity.

Boris manages Peony Gallery - An Post-physical Exhibition Space – the first crypto art blockchain gallery in Bulgara.

Fourfold of Infinities: The main objective of the present thesis is to demonstrate how Hegel's categories, concepts, language, syntax and semantics, his use of rhetorical power exhibit topological notions and thus the reading of Topological (in) Hegel is open for conceptualization. My assertion with the present thesis is that topological reading of Hegel unfolds true topological system, thus there are reasonable grounds for us to see the doctrine of Hegel, in particular his Science of Logic and Philosophy of Nature as Hegel's Analysis Situs.

Topological (in) Hegel

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Dimitrov

Borislav Dimitrov

Topological (in) Hegel

Topological Notions of Qualitative quantity and Multiplicity in Hegel's Fourfold of Infinities

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