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A UNIFIED NET FOR POLYHEDRAL STRUCTURES: INTRODUCING A NEW 2D FOLDABLE GEOMETRIC UNIT

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Abstract
In this paper, we present a geometric model unifying a series of polyhedra structures. Specifically, we demonstrate the possibility of one specific form of octahedral net comprising eight equilateral triangles, which I name *octafold*, to explain a definite series of polyhedra. It is one of 11 known nets of the Octahedron [Weisstein (n.d.)].

In geometry, a net is the unfolding of a single, simply connected, non-overlapping polygon comprising the faces of the polyhedron as they are attached at their edges [Demaine, O'Rourke 2007]. Polyhedral nets date back to 1525, when the painter Albrecht Dürer (1471–1528) found a way to represent polyhedrons in 2D nets [Malkevitch 2001]. Dürer introduced the notion of *polytope nets* and published nets for some of the Platonic and Archimedean polyhedra along with directions for their reconstruction [Schlickenrieder 1997]. In the half millennium that had elapsed since then, Dürer's nets have become a standard presentation method for describing polyhedra [Schlickenrieder 1997]. In 1971, mathematician Father Magnus J. Wenninger made accessible the world of nets and their folding into polyhedral structures by publishing his book *Polyhedron Models* [Wenninger 1971].

The Octafold unit introduced herein has proven to be the common denominator of many polyhedra and other complex structures and has shown great flexibility when multiplying the single folding unit. Among others, this unified net explains three of the five Platonic solids and several of the Johnson solids. It is thus shown to be a replicable technique for unfolding polyhedra to form a 2D plane whose faces do not overlap. Moreover, the model represented by these two findings can be extended physically by tessellation and may also be applied to other fields of interest.

Despite its ancient roots, the field of nets is considered a relatively new field of research, bringing together the disciplines of spatial geometry and molecular physics and biology, where the concept of self-assembly is significantly powerful [Pandeya, Ewingb, Kunasc, et al. 2013]. Genetic engineers are pursuing a stimulating quest for the rules governing the self-assembly of protein ribbons into complex three-dimensional structures while nanotechnologists are seeking basic folding blocks that can be folded into complex structures [Fernandes, Gracias 2012]. The ability that researchers have achieved in folding basic geometric structures such as polyhedral as well as in self-assembly laboratory experiments using molecules such as those which comprise our DNA, is striking [Smith, Hirst, Love, et al. 2005]. Such potential, however, has not yet been investigated in detail and is only touched upon herein to show the different trajectories it may follow.

Figure 1. (a) The stella octangula (b-c) deconstructed in a spiralling movement into (d) an inner octahedral hollow surrounded by the three-dimensional spiralling-tetrahedral folding unit, from which the (e) two-dimensional spiralling-octahedral polyiamond folding unit a two dimensional is derived.

The Octafold unit of this model is controlled by an attraction-rejection pattern that lies at the heart of the folding and unfolding of these structures. To describe the two elements controlling the folding and unfolding of several series of polyhedra (specifically, deltahedra), I begin by describing the octahedral folding unit. I then describe the attraction-rejection pattern governing the folding unit as well as possible derivative tessellations. With this knowledge, I show how this specific net unifies different polyhedrons and other complex structures.

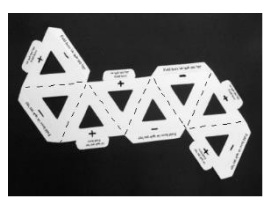


Figure 2. The paper Octafold unit and its magnetic attraction-rejection pattern translated into paper slits and slots (+ and – signs) and seven folding hinges (marked by a dashed line).

THE OCTAFOLD UNIT

The model's basic building block was uncovered while investigating the unfolding process of the *stella octangula* (Figure 1(a)). Eight tetrahedrons were found to unfold in a spiralling movement (Figure 1(b)) leaving an empty space

shaped as an octahedron (Figure 1(c)). This three-dimensional net is the basic tetrahedral unit of the model (Figure 1(d)). Reduced to its two-dimensional form, the spiralling-octahedral folding unit of the model emerges (Figure 1(e)). The model presented herein has been transformed into a paper-based octahedral building unit comprising eight equilateral triangles and seven folding hinges; its magnetic attraction/rejection pattern has been translated into paper slits and slots (Figure 2).

THE ATTRACTION-REJECTION PATTERN OF THE OCTAFOLD UNIT

An indispensable characteristic of the folding unit is its unique attraction-rejection pattern. The folding unit functions as an autonomous unit that can interrelate with other Octafold units or parts thereof in numerous manners forever maintaining its attraction-rejection pattern. This is true whether folding units are tessellated in a two dimensional space or whether they are folded in multidimensional space. For this reason, folding units may be conjoined in whole or partial segments, and partial segments may be symmetrically or asymmetrically truncated. The attraction-rejection qualities of each triangle in the polyiamond folding unit are presented in Figure 3(a), leading to the full attraction-rejection pattern of the folding unit, which is presented in Figure 3(b).

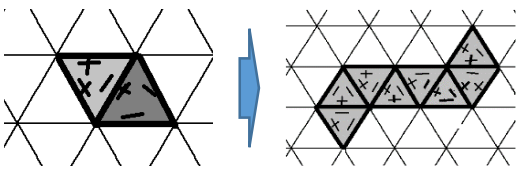


Figure 3. (a) Attraction and rejection relationships between each two triangles of the Octafold unit; (b) the overall attraction/rejection pattern of the folding unit.

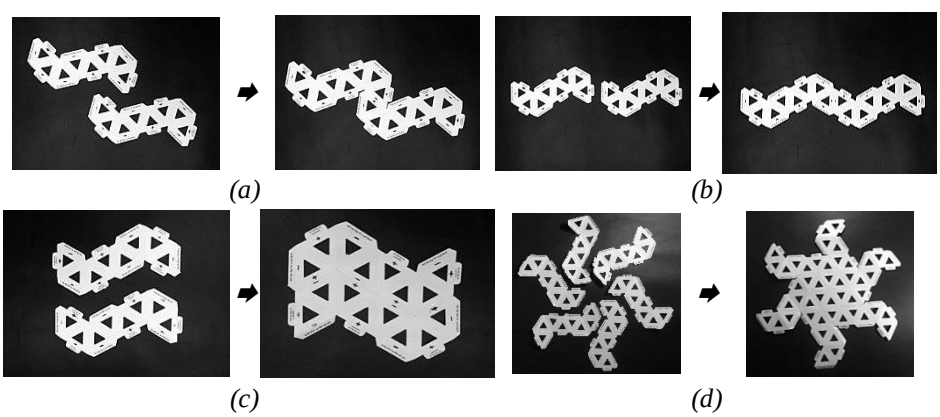


Figure 4. Tessellating the folding unit: (a) A chained helix-like continuum of folding units; (b) horizontal continuum of folding units; (c) vertical continuum of folding units (a) star-like continuum of folding units.

These relationships play a significant role not only in the subsequent folding of the folding unit but also in the manner by which folding units may be connected to each other. The folding unit may be connected to form unit continuums in four different patterns. The

chained helix-like connection (Figure 4(a)) links folding units in a chained sequence where the tail of one folding unit integrates into the head of the next folding unit to form a unique spiraling chain of amalgamated units. The horizontal connection (Figure 4(b)) links folding units next to each other so that they form a rather wide strip of amalgamated units while the vertical connection (Figure 4(c)) links folding units below each other so that they form a rather narrow but elongated ribbon of amalgamated units. Finally, the star connection (Figure 4(d)) links folding units in a star-like sequence next to each other.

THE UNIFIED NET OF POLYHEDRON STRUCTURE SEQUENCES: THE CHAINED CONTINUUM OF THE OCTAHEDRAL FOLDING UNIT

All known polyhedral structures unfold into several different nets. For example, the tetrahedron unfolds into two nets, the cube and the octahedron unfold into eleven different nets each, and the dodecahedron and icosahedron can each be unfolded into 43,380 distinct nets [Pandeya, Ewingb, Kunasc, et al. 2013; Weisstein (n.d.)]. An important question thus emerges regarding the criteria we can employ that determine how we search efficiently for the optimal net among a vast multitude of available nets [Pandeya, Ewingb, Kunasc, et al. 2013]. Lacking the availability of simple pedagogical tools, it has thus far been near impossible to explore this field effectively [Meenan, Thomas 2008]. The model presented in this paper unifies many polyhedral structures by unfolding them into a single net, one of eleven known nets of the octahedronal net, which serves as the folding unit of all these structures. Moreover, the model presented herein allows for a simple and joyful exploration of this rich world of polyhedral structures underlying our very existence and the world at large. It allows both children and adults to experience first-hand these important polyhedral structures, which were left out of school curriculum, as they may be built by hands without any accessories.

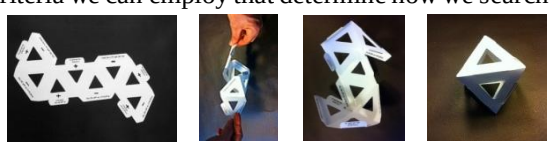


Figure 5. The folding process of one folding unit in to octahedron.

Figure 6. The folding process of two chained helix-like folding units into a Gyro-elongated square dipyramid (J17).

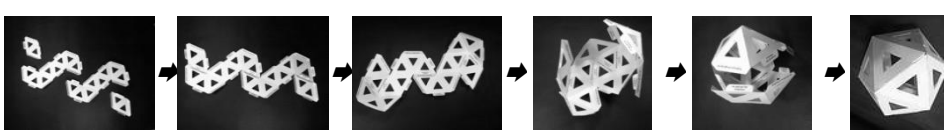
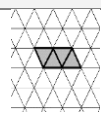
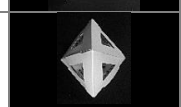
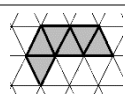
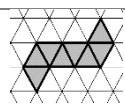
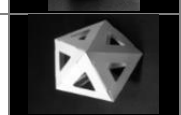
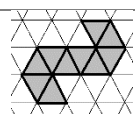
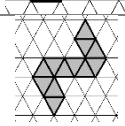
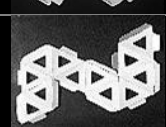
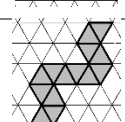
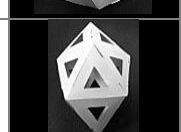
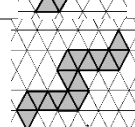
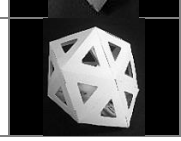
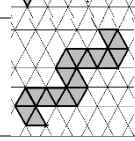


Figure 7. The folding process into an icosahedron of two chained helix-like folding units with symmetrically appended pairs of two triangles on each segments.

In this section, I present the folding process of the chained continuum of the octahedral folding unit. This connection results in a helix-like ribbon. Any segment of an even number of equilateral triangles greater than four may fold into a polyhedral structure. Some of these structures are yet unnamed. When tessellated, the folding unit presented herein allows for a unified and systematic folding of an infinite sequence of polyhedrons in an "evolutionary" movement. Depicts this sequence starting with the smallest polyhedron, the tetrahedron, and growing into more complex polyhedrons. While this paper presents the folding process of helix-like ribbons comprising up to 24 equilateral triangles, the principles described herein are applicable to any length of helix-like ribbons comprising an even number of equilateral triangles. Figures 5-7 show the folding process of various lengths of helix-like ribbons and the polyhedra into which they fold.

Item No.	***Polyhedron name***	***Polyhedron shape***	***No. of facets***	***Unified net***	***Unified net (paper model)***	***Net length in folding units***
1	*Tetrahedron*		*4*			*0.50*
2	*Triangular bipyramid*		*6*			*0.75*
3	*Octahedron*		*8*			*1.00*
4	*Decahedron*		*10*			*1.25*
5	*Rhombohedrum*		*12*			*1.50*
6	*Triaugmented triangular prism*		*14*			*1.75*
7	*Gyro-elongated square dipyramid (J17)*		*16*			*2.00*
8	*Unnamed polyhedron*		*18*			*2.25*

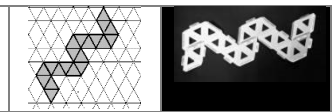
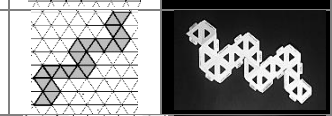
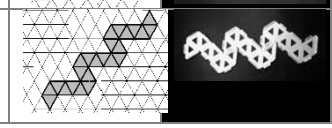
9	*Icosahedron*		*20*		*2.50*
10	*Unnamed polyhedron*		*22*		*2.75*
11	*Hexagonal antiprism*		*24*		*3.00*

Table 1. Specified for each (deltahedron) polyhedron structure in the sequence mentioned above, its name (where known), the number of facets it comprises, the net from which it is folded (both schematic and in the paper model), and the length of the helix-like chained ribbon in relation to the single octahedral folding unit (from 0.5 to 3). Each of the net sequences shown in Table 1 adheres to the original attraction-rejection pattern described earlier. When folded, then, the multidimensional polyhedron structures also adhere to the attraction-rejection pattern of the folding unit.

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TESSELLATING FOLDING UNIT CONTINUUMS: VERTICALLY, HORIZONTALLY, AND IN STAR-LIKE FORMATIONS

When folded, different tessellation forms of the single folding unit result in a wide variety of structures. As mentioned earlier, the attraction-rejection pattern governs the behavior of all tessellated folding units thus limiting the potential of structures by a certain degree. When extended, vertically, horizontally, or in a star-like formation, the tessellated units form structures in what might be a somewhat intuitive manner (see Table 2).

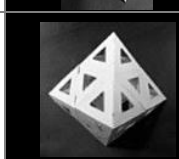
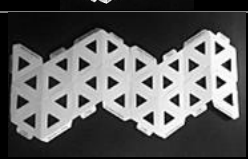
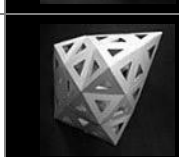
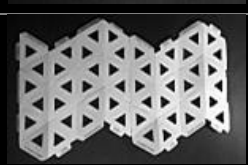
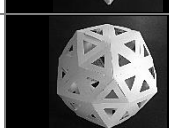
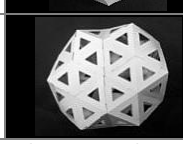
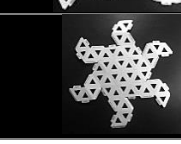
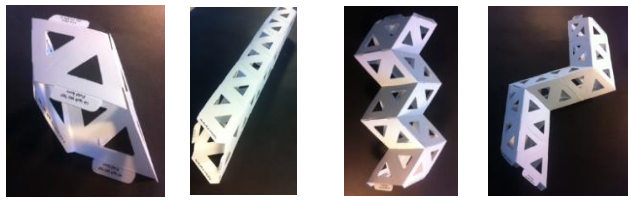
Item No.	*Polyhedron name*	*Polyhedron folded from paper net*	*Net from which the polyhedron was folded*	*Net description*
1	*Unnamed polyhedron*			*Two vertically tessellated folding units*
2	*Pyramid star*			*Three vertically tessellated folding units*
3	*Large tetrahedron*			*Two horizontally tessellated folding units*
4	*Large octahedron*			*2x2 matrix of horizontally and vertically tessellated folding units*
5	*Unnamed polyhedron*			*3x3 matrix of horizontally and vertically tessellated folding units*
6	*Unnamed polyhedron*			*Three octahedral folding units in star like connection*
7	*Unnamed polyhedron*			*Four octahedral folding units in star like connection*
8	*Unnamed polyhedron*			*Five octahedral folding units in star like connection*
9	*Unnamed polyhedron*			*Six octahedral folding units in star like connection*

Table 2. Tessellated forms of the single folding unit and the polyhedra structures into which they fold.

Horizontally tessellated folding units may also be used in a layered manner, opening a new vista of potential structures, including tubes and tunnels (Figure 8).



(a) *(b)* *(c)* *(d)*

Figure 8. Tube formations created from horizontally tessellated folding units: (a) a single spiralling-octahedral basic unit folded into a band; (b-d) various forms of tubes produced from joined bands of the spiralling-octahedral basic unit.

CONCLUSION

This paper presented the Octafold unit, comprising eight equilateral triangles with a specific attraction-rejection pattern, as the common denominator of several series of polyhedron structures, unifying their folding and unfolding patterns. I have only briefly shown the manner by which the folding units may interact with other folding units to form elongated strings or a continuous sheet of tessellated triangles. While these are governed by a different designated folding system they all conform to the same attraction-rejection pattern. I have also shown how the layered folding of the folding unit can serve to form various structures. The Octafold unit discussed in this work has yet to be researched to receive scientific validation. I draw on Wenninger's call in the epilogue of his book to achieve this goal:

> "The object of an investigator would not be to multiply forms but to arrive at the underlying mathematical theory that unifies and systematizes whole sets of polyhedral forms" [Wenninger 1971].

Treading pristine grounds, applicable consequences of the model proposed herein are still vague. Yet at a very practical level, this model offers a simple folding unit that facilitates further experiential investigation of the formation of polyhedral structures from two-dimensional nets. Thanks to its specific attraction-rejection pattern such investigations are possible without the need of complex mathematical formula, angle calculations, or even glue. The power of the model lies in its simplicity.

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FEEDBACK VISUALIZATION ON FORMATIVE ASSESSMENT SYSTEM FOR MATHEMATICS

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Abstract

A formative assessment system is a tool for the teacher with which he gets the ability to assess the student's cognitive level, as well as trace the student's knowledge gaps and misunderstandings. A system like this will provide information regarding the students' learning course and their cognitive level graphically, so that learning can be more comprehensible and more palatable to the teacher. On an opposite occasion, the system should either provide numbers and indicators to the teacher, which require time to be understood and related by the teacher or provide some kind of text, which is difficult to be composed automatically and is also time consuming until the teacher collects the necessary information. Visualization and graphical representation of feedback give the ability for more, better and fuller information to the teacher about the students' learning course. Moreover, in this case, the teacher grasps the information more quickly and needs less time to process it. The visualization of information that such a formative assessment system for mathematics provides to the teacher about the student's learning course is presented on the present paper. The student is assessed on the known five mathematic sections, which are Numbers, Measurement, Geometry, Algebra and Statistics-Probability. Each one of the above sections is divided in sub-sections or classes. The student has an assessment indicator or assessment gauge for each one of these classes and

one for the overall section they constitute. Finally, the student's total image gets measured with a global assessment gauge, which comes from every section the student has been assessed. This assessment gauge comprises of a circle on the center of which the student's assessment indicator is inscripted for the particular class. The circle's color depends on the student's performance. For example, it becomes yellow if the student's performance has been increased on the particular class. There is, also, a bar graphic around the circle, which graphically represents the assessment indicator or score of the student on the particular class. The assessment indicator is between 0 and 1 in real numbers. This assessment gauges with some graphical representation on the student progress is the main feedback visualization of the formative assessment system for mathematics.

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ONTOLOGY OF "OTHER WORLDS" AND NON-ARISTOTELIAN, IMAGINARY LOGIC

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Abstract:
The history of ideas show us that the idea of "possible worlds" has been often fruitful for the discovery of radically novel, revolutionary scientific theories. The same happened

with the invention of the first non-classical logic in 1910, notably, the non-Aristotelian logic, call "imaginary" by its creator, N.A. Vasiliev, Professor of Kazan University. Prior to this discovery N.A. Vasiliev was active as a Symbolist-style poet. The idea of 'other worlds' was rather common in Russian Symbolist poetry. Vasiliev, in his poetic book *Longing for Eternity* (1904), used this metaphor; however, he was the only poet who ascribed to these worlds certain contradictory features. In his first logical article, were he put forward the idea of non-Aristotelian logic [Васильев 1910], Vasiliev implicitly rests upon the ontology of possible ('other') worlds. He claims that the underlying ontologies of formal logics should be different for various possible worlds; this implies that these logics have different empirical underpinnings in these worlds. He called these logics *imaginary logics*. A logician has the option to initiate different experiments in logic, due to the change of the ontology of possible worlds.

Different ontologies presuppose different kinds of perceptions. For instance, in our (telluric) world, according to Vasiliev, living beings could form only one type of judgement, i.e. affirmative judgement. Nevertheless, in some imaginary world, living beings might have not one, but many kinds of perception and, hence, many kinds of judgements. The variety of judgements pave the way for a plurality of logics. All these logics are legitimate to exist, and worthy of systematic study and development.

The fundamental laws of classical, Aristotelian logic (the law of contradiction and/or excluded middle) are abandoned within the new logics; they should be replaced by other laws (for instance, the laws of excluded fourth, fifth, etc.). The denial the fundamental laws, according to Vasiliev, is a powerful method of construction of novel logical systems.

Following N.I. Lobachevsky's methodology, who was also a professor at Kazan University and in 1829 abandoned Euclid's fifth postulate to suggest an alternative geometrical system relying on a denial of this postulate (which he called *imaginary*), Vasiliev called his new logical system *imaginary* as well, because he did not know an explicit, valid interpretation for it.

Due to his invention of imaginary logic, N.A. Vasiliev is now considered as a forerunner of non-classical logics.

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POSSIBILITY, IMAGINATION AND CONCEPTION

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Abstract
In this paper we investigate the relations between possibility, imagination and conception. We develop a theory according to which these three notions are compatible but independent. This means in particular that none of these notions reduces to another one and that there are things which are:

(1) Imaginable, but neither possible nor conceivable.

(2) Conceivable, but neither possible nor imaginable.

(3) Possible, but neither imaginable nor conceivable.

We first explain our methodology: structuralism, equilibrium between norm and description, prototypical examples. And then we proceed.

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TRACING A SHAPE THROUGH THE HISTORY OF VISUAL POETRY: SPIRAL GOES ROUND AND ROUND

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Abstract: Visual poems are poems in which the visual component is connected to the topic of the poem. This visual component can consist of poetic lines of specific length together producing a specific image, emphasized letters inside the poem united in a specific figure, letters of various sizes and type, hand-written curved letters and so on. Visual poetry were invented by Simmias of Rhodes, who lived in Alexandria in the 4th century BC. First visual poems appear as *technopaignia* (*τεχνοπαίγνια*, lat. *carmina figurata*, eng. *figure poems*, *visual poems*), or 'games of mind' practice. The author of a visual poem provides the reader with a clue to the text as well as deepens the text through interaction of visual and semantic components. Comprehending of visual poetry demands both analytical thinking and imagination, and appeals to both hemispheres of the human brain: the left one for logical understanding, including language and written language comprehension, and the right one for intuition, for image processing. After Simmias, who

started European visual poetry with texts in the shape of egg, wings and axe, there were Dosiadas with The Altar, and Theocritus with The Shepherd Pipe figure poems, followed by a number of Greek, Latin, Middle Ages, baroque, classicist, modernist, avant-garde and post-modernist poets. A variety of visual poetry forms has historical and cultural fundaments and philosophical and aesthetic meaning. Several images had specific connotations throughout the centuries: cross was for the faith topics, sun for celebrations and court topics, bottle and cup for amusing topics, heart for passion topics, and so on. In my paper, I will focus on poems in the rare form of spiral. In a figurative sense, the spiral means permanent development and growth, if seen from inside to outside, and increasing of tension in the inevitable approach to the centre, if seen from outside to inside. Whether it is a spiral of passion, or spiral of hate, or spiral of faith, it is continuously developing, changing and rotating around the centre. Spiral poems were written in Latin, German, French, Italian, Russian and English. Evolution of poems in the form of spiral generally coincides with the evolution of other visual poems, passing through the same stages of being sacred poem, intellectual poem, amusing poem, avant-garde poem, and children poem. On the other hand, spiral visual poetry has its own characteristic features, such as large time gaps, very rare appearance until the early 20th century, and a surge of interest in the modern era.

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PERSONALITY MODEL

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Feb 28th - March 1st, Chelsea Town Hall, Personality Model + The science is a subset of the Art
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Abstract
Personality Model presents the new methods assessing intelligence and creativity, based on a creation of logical series, and also explains a logic of psychosis. I show how the visualization of intelligence in logical series, may be applied to visual arts: video-animations.

Although the advanced mathematical or logical approach may be applied in Personality Model, the basic definitions are simple and understandable by non-experts too. Every person has certain level of intelligence distributed in logical series (more or less changing in time). The core series is self-identity of 'ME's in various times, spaces (I am same now, yesterday, last year, tomorrow. My hand, leg, head, eye is ME).

Psychosis (schizophrenia, manic-depression) captures intellect in one series (vicious circle of self-refutations) absorbing all intelligence of all series(es) including self-identify. Intelligence is captured, not necessarily deteriorated as E. Kraepelin (1865-1926) thought. The form of vicious circle: *p, p, p, p* … defines psychosis. The content is secondary, which corresponds to K. Jaspers' *General Psychopathology* (1913). But Jaspers never defined the psychosis, his work is just description. As I will show: the higher intelligence, the lower chance of psychosis. And the more opportunities, the lower chance of psychosis. So Kraepelin was statistically right, but psychosis can occur with a

high intelligence too. On the other hand, a popular belief – a high intelligence or genius increases the risk of psychosis (or mental disease), is untrue. It may be partially true, only due to long-term lack of opportunities, or (intentional) social exclusion.

Analogy to Personality is computer with multiple processes (series(es)) occupying a memory and processor time (intelligence). The core process (BIOS) is a must for other processes. Psychosis is a process out of control (memory leak) occupying all memory, processor's time.

Intelligence is one. 'Social', 'emotional', '*xy*' intelligence is illusion. For instance, empathy needs certain intelligence to understand others. It doesn't guarantee empathy (pro-social behavior), but probability of empathy (and less prejudices) raises with the level of intelligence.

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VARIATIONS OF THE FEMALE IMAGE IN TURKISH CERAMIC ART: A HISTORICAL PERSPECTIVE

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Abstract

To be born as a woman is to be born in a private and enclosed property of a man
(John Berger *Ways of Seeing*)

"Clay", as the main material of ceramic, defined as the purest form of "terracotta". Ceramic entered in human's daily lives at the early stages of civilization and has continued pervading until the present day. Looking at the first ceramic female images in history, which is dated back to 7000 until BCs, female images are considered to be the mother goddess symbolizing fertility. Mother goddess also symbolizes "creativity", "prosperity", "sexuality", "maternity" and most importantly "motherhood"; they are all considered as the qualifications of female's character.

When we look from 7000 BC up to date, it can be said that female figure is popular in all times. However, it is visualized by referring to different meanings each time, under the influence of the conditions of every period. The changes we notice in the female image

can be considered as indicators of social and cultural interaction of certain period. These indicators of both male and female images are very important, because of our existence in society. These images are both products and parts of the traditions, religions and cultures which are carried out for many years.

The female figure in Turkish ceramic art is present until today, manifesting changes influenced by cultural and political facts and the industrial revolution.

In this study, art works will be presented in order to understand which changes have been undergone and ascribed new meanings to the concept of female figure in Turkish ceramic art.

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THE NOTION OF METACINEMATIC GESTURE AND A GRID OF INTELLIGIBILITY FOR METACINEMA

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Abstract
In this paper I am going to discuss the problem of self-reflexivity in cinema being the investigation focused on the meta-representational status of art. Namely, the following set of insights will address those questions: what is metacinema? What is a metacinematic gesture? And what does this gesture commit us with as researchers?

Here the prefix *Meta* is linked to those creative works that makes reference to themselves or to the exposure of the conventions of their different genres and linguistic specificities. 'Thus it is worth pointing out that the concept of "reflexivity", which is derived etymologically from the Latin *reflexio/ reflectere* ("bend back on") and was first borrowed from philosophy and psychology, where it referred to the mind's capacity to be both subject and object to itself within the cognitive process' [Stam 1992, xiii]. The point of being both "subject and object" of oneself while being present at a work of art does not only remind the aesthetic allusions provided by the painting *Las Meninas* (Velazquez, 1656), but gives us also access to a political and sociological domain of reflection. What "seeing ourselves seeing" enables is an interesting psychological circuit that interrupts the constructed and unobstructed flow of our common perceptions about art (and, perhaps, also about the social and political reality) we were accustomed to by the previous education to the consumption of audio-visual products.

In the first place, it might be said that the technical specificity of the cinematic medium is *per se* metacinematic. Namely, every time the spectator observes on the screen any allusion to the technical magic, or the illusionistic nature of cinema, she or he is automatically encouraged to reflect upon its linguistic status. In that sense, the exposure of the technical machinery is always a kind of metacinematic reflection. One of the first cinematic screenings of the history, the *Arrival of a Train at La Ciotat* (Auguste and Louis

Lumière, 1895) is a key example in that sense. In this pioneering work, the naïf spectators see this train approaching the station towards their direction while experiencing feelings like fear and confusion, as if they were about to be run over by it [Loiperdinger and Elzer, 2004]. Likewise, such impression is literally displayed in the short silent film *How It Feels to Be Run Over* (Cecil, Hepworth, 1900). So, the issue does not revolve around the fact Metacinema recreates the shock effect generated by the vision of Lumière brothers' film, but rather that the cinematic medium already contained a self-reflexive potentiality and that, as a medium, it was naturally inclined to produce such kind of insights in the spectators' minds.

Metacinematic movies have been considered, since the theoretical reflections of the French New Wave (Nouvelle Vague), with François Truffaut and Jean Luc Godard in particular, as potentially subversive. The reason is that those kind of self-reflexive gestures reveal the narrative and technical conditions which constitute them and produce a kind of estrangement effect by disrupting the spectator's suspension of disbelief. Indeed, while becoming aware of being witness of a fiction that displays the origins and the modes of production, the spectator reinforces his expectations towards the show with the notions stemming from his own cinematic education [Ciciotti, 2006]. Contextually, but with regard to different cinematic regimes of communication, Casetti and Di Chio, expound how two fundamental arrangements can be distinguished: the "referential communication" and the "metalinguistic communication'. The first one is mainly endowed with the transmission of the content, the presentation of an object, the denotation of reality. What it counts here, is to show the world and to see the world by hindering this "showing" or "seeing" might emerge as mediated. Instead, the second regime of communication, the metalinguistic one, is focused on the act of communication at such. What they intend here is that it is not much about showing the world (even though it is inevitably present as the content of the image), but rather the very act of "showing" and "seeing" [Casetti and Di Chio, 2009].

In that sense, metacinema, the metalinguistic form of communication for cinema, disrupts the reality precisely by imposing a new one which is typically cinematic and that, although it unavoidably recalls the signs of reality, insists to drift from it by heralding the independence of a linguistic and technical specificity. So, using Pasolini's words, even though 'cinema expresses reality with reality' [1988, 133], metacinema, or what he would have called "cinema of poetry", exposes the possible choice to exert a detaching movement from it, by advocating the autonomy of the cinematic language from reality itself. This happens because, according to Pasolini, a self-reflexive development of cinema entails a deep and focused refection over the linguistic and technical specificities of the cinematic medium and, therefore, the effort would be directed towards an entire set of semiotics speculations and practical experimentations that somehow distance them from the real referents. Such detaching process is precisely validated by the "estrangement effect", but undoubtedly it does not completely eschew the confrontation with reality.

Considering this, it should be clarified that the main interest of this paper does not deal much with the political substance of metacinematic movies but it rather revolves on how self-reflexive depictions deal with reality and what they disclose or conceal about

cinematic art at such. Nonetheless, a political and, foremost, an ethical reading of some particular metacinematic gestures cannot be utterly disregarded.

For what concerns the interplay of metacinema and the idea of gesture, the urgency is to clarify a few conceptual points in order to construct a sound basis to our discourse along with the possible inclusion of other considerations about the physical, ethical and political substance of a metacinematic gesture. In point of fact, Giorgio Agamben [2000] provides an insightful reading of the notion of gesture by interlacing it with Gilles Deleuze's proposition of the idea of cinematic image-movement within *The element of cinema is gesture and not image* (in the context of a set of reflections included in the chapter *Notes on gesture* within the philosophical compendium *Means without end, Notes on Politics*). There is a crucial passage in the folds of the discourse where Agamben paraphrases Deleuze (*Cinema 1: The Image Movement*, 1986) overriding the deceptive psychological distinction between image as psychic reality and movement as physical reality. In that, cinematic images result to manifest themselves in the guise of *coupes mobiles* (mobile sections), which recall at different moments both the psychological and perceptive effect of their ghostly materialization as images and their dynamic tangibility as virtual gestures which exert a pressure towards their own actualisation.

Without going in-depth with these passages, Agamben squares the circle around the complex issue of what a gesture is with the intention to sketch a definition that might connect such notion with those of metacinema and self-reflexivity: '*The gesture is the exhibition of a mediality: it is the process of making a means visible as such.* It allows the emergence of the being-in-a-medium of human beings and thus it opens the ethical dimension for them.' [Agamben 2000, 57]. Along these lines, a crucial part of the investigation should focus on the relocation of the role of authorial subjectivity within such exhibition of pure mediality or where the purported endeavour of letting the cinematic discourse speak for itself fails to pay the original promise. In this regard we should stress that, as Ten Bos points out, one of the problems is that the gesture is more like a substitute of spoken language and that it is also difficult to rectify. The gesture is a quick and non-reflective act which lays claim to be different from language or metalanguage [Ten Bos, 2011]. Yet, the more the gesture is self-reflexive, the more it slips away from itself. So, in this sense it would not supposedly be liable for a thorough analysis. If we stay with Ten Bos, who radicalises gesture's pure moral significance as a spontaneous bodily movement, as it happens for dancing [Ten Bos, 2005], the gesture would not solely refrain itself from manifesting any specific goal, but it would also be deprived of any promising comprehensible grasp from a cultural standpoint. So, rather than going in depth with this extreme reading of gesture, as situated in an imprecise place between nature and culture, spontaneity and reflexivity I will suggest bearing in mind Agamben's correspondence between the notion of gesture and the "exhibition of mediality" characterised by the metacinematic move. Nonetheless, one might say that such correlation would be more appropriate to pin down the moments where the pure spontaneity of the metacinematic gesture, such short-circuit of language, can possibly get altered by the authorial subjective intention, with its attendant canalisation in the teleological (and ethical) tracks that for Ten Bos spoils the outburst of its unexpressed dynamism and physicality.

We will see how such ethical dimension can be triggered by few metacinematic gestures and how it might be exposed, or concealed, by the tension between what is visible and what is not within cinematic representation. In fact, the dialectics of disclosure/ concealment is strictly related to what has been deliberately shown, or, conversely, kept secret in a motion-picture with regards to the mechanics of production, the exposure of the cinematic apparatus, the complex power relations between professional collaborators or even the profound sense of what cinema represents as a medium for the creative minds of these technicians at work. All these metacinematic gestures, along with the way they have been devised, selected and exposed, have more than something to do with the ethical choices operated by the author/director according to the economic and practical constraints he/she is subjected to.

Again, I would like to insist on the tension between what is visible and what is not, to what is shown and what is concealed within cinematic representation. That is the reason why I will attempt to present an original classification of four main metacinematic forms that can be encountered with respect to the huge constellation of different self-reflexive gestures that have been proposed throughout the history of cinema.

These four categories do not follow a *ratio* which is related to temporal or geographical conditions of production, but they are rather akin to a reflection about the different aesthetic nature of metacinematic gestures. Therefore, I outline four metacinematic categories as: *referential, realist, surrealist* and *productionist.*

Referential (or citationist) Metacinema is the category which displays the use of postmodern *pastiche*, or the blend of different aesthetics forms extracted from past works as previous films and audio-visual representations. The pastiche directly draws on some examples from literature as Raymond Queneau's *Exercises in Style* (1947) or David Lodge's *The British Museum Is Falling Down* (1965). In these works the referent is precisely related to the use of a literary pattern which is *remade, reemployed* or *rearticulated* in other forms. In this regard, it has been pointed out that 'likewise, there are movies that introduce elements belonging to precedent cinematographical texts (meaning as a text any expression with communicative purpose), which are defined as "transtextual films" [Díaz 2014, 114].

Realist metacinema is the kind of self-reflexive cinema I would associate to those cinematic works which take into account all the theoretical and conceptual implications related to the presence or the absence of the camera on the screen. But they differ from other forms that I will label under the *productionist* category. In fact, the reflections of realist metacinema revolve around the aesthetic value attributed to the presence/absence of the camera without going in depth with other aspects which are prevalently organisational, practical or related to the intersubjective relationship between the members of the film-crew during the process of filmmaking.

Surrealist metacinema is the kind of self-reflexive slant which detaches itself from the realist one for the interruption of the normal flux of images exerted by the sudden invasion of dreamlike visual effects or free associations of metacinematic discourses. In general we deal with a set of images that disrupt the logical sequence of the shots that follow a spatio-temporal coherence. Drawing again on Agamben's account around the centrality

of the gesture as the core part of cinematic forms expression, even if entailing the addition of political and ethical substance to the aesthetic side, we might comply with the following quotation as productively dialoguing with the idea of surrealist metacinema. 'Cinema leads images back to the homeland of gesture. According to the beautiful definition implicit in Beckett's *Traum und Nacht,* it is the dream of a gesture. The duty of the director is to introduce into this dream the element of awakening' [Agamben 2000: 55].

Productionist metacinema**:** In the first place it should be clarified that with the adjective productionist I do not mean to connect a particular metacinematic gesture with the idea of productionism: as a general doctrine based upon the importance of production in a capitalist sense. I rather address those works focusing on the particular role of the author who displays his or her presence as the agent of production, while also taking into account other aspects of filmmaking such as the means of production, the budget, the size of the film crew, the environmental conditions and the narrative constraints of the screenplay. It is proposed that metacinematic productions might serve to simultaneously reveal and construct a new authorial and directorial subjectivity through the matrix of the various strategic choices operated on the set. In a nutshell, productionist metacinema, as a reflexive form, turns cinematic production back on itself rendering it open to questioning the organisational and practical aspects of filmmaking.

Some examples of productionist metafilms are: *Chronicle of a Summer* (Morin and Rouch, 1961), *Contempt* (Godard, 1963), *Curd Cheese – Ro.Go.Pa.G* (Pasolini, 1963), *Day for Night* (Truffaut, 1973), *F for Fake* (Welles, 1973), *Burden of Dreams* (Les Blank, 1982), *Voyage in Time* (Tarkovskij, Guerra 1983), *Histoire(s) du Cinema* (Godard, 1988), *Close-Up* (Kiarostami, 1990), *My Best Fiend* (Herzog, 1999), *Grizzly Man* (Herzog, 2005), *The Five Obstructions* (Von Trier, 2003), *Tarnation* (Caouette, 2003), *The Unmaking of (O cómo no se hizo)* (Juan Manuel Chumilla Carbajosa, 2010) *The Act of Killing* (Oppenheimer, 2012) and *The Wolfpack* (Moselle, 2015). A further investigation of such range of movies would be likely to generate a cross-section of organisational models of filmmaking. In fact, these films could also be deemed to potentially reveal, more or less transparently and self-reflexively, the dynamics of production.

Ultimately, the crucial sense of exalting the importance of these metacinematic gestures is that they could represent interesting examples of what different authors want to disclose or conceal about the art of filmmaking. Or, in a nutshell, we should pay attention to the construction of our theoretical hypothesis by taking into account that the productionist metafilm is always a combination of revelation and concealment. It is exactly with the problematisation of this dialectics of visibility/non-visibility, as present in those kinds of self-reflexive products, that it could be possible to illuminate the "shaded zone" of cinematic process and perhaps shed light on the specific ethical domain of filmmaking art.

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VISUALIZATION AND NARRATIVITY IN GREEK CLASSICAL ART; STORIES AROUND THE MYTHOLOGY AND REALITY OF DEATH ON ATHENIAN WHITE-GROUND LEKYTHOI

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Abstract

Throughout the 5th c. BC numerous lekythoi (perfume vases), meant to serve especially as grave gifts, were produced by ceramic workshops in Athens. Not all lekythoi were funerary, but when they did, they were almost exclusively painted in a special, delicate and more "painterly" technique, involving polychromy on a white painted background, the so-called white ground technique, that is considered to imitate more closely the impression of works of muralists and panel-painters (major painting), almost completely lost to us today. Moreover, funerary lekythoi bear various scenes, appropriately inspired by the mythology of death, such as Charon, the ferryman of the dead, or Hermes, as leader of the souls, receiving the deceased to help them cross over,

as well as by contemporary burial customs, mainly the visit of female relatives to the tomb after burial; an iconography which we also find on gravestone reliefs or stone lekythoi of the time, serving as grave markers.

This presentation aims to address several issues about the nature and the main principles of visualization and narrativity in this particular category of images and in the visual arts of Classical Greece in general. Can we actually claim that funerary scenes on lekythoi recite stories, even if they present some sort of generic narrative, lacking individuality and specificity? If so, what are the conventions employed, so as to codify and convey particular meanings in imagery? What particular methods are generally used in Classical art, so as to construct and communicate a pictorial narrative? What is the relation between art and life and/or nature? How is the surrounding space conceived and rendered? How are the figures placed in space, is there any particular type of perspective applied? How are the actions and intentions of individual figures denoted? How is the emotional state of the dead and their relatives expressed? Can we trace any changes in the conveyance of emotion from the Early to High and down to the Late Classical period, while Athens goes through major wars, against the Persians and the Spartans respectively? Is it possible that the composition and the style of the lekythoi scenes in question, especially the modeling of volume and space, were inspired by contemporary major painting? If so, to what extent and on what terms? Furthermore, how do these funerary scenes relate to those on grave reliefs? Last but not least, how do the pictorial traditions of vase-painting, major painting, sculpture and literature interact? Can we detect any sort of influence from one to the other, or do they follow parallel pathways that may converge as much as they may diverge?

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SYMMETRY AND UTOPIAN SPACE IN ROMAN WALL PAINTING

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Abstract
In Roman frescoes, ornamental elements are often repeated in symmetrical patterns [Bragantini 2014, 357]. Despite the considerable variations in the use of the established repertoire, the tripartite division of the wall surface, first horizontally and later also vertically, becomes a common scheme from the Late Republican times (40-30 BC) onwards. Although a paratactic organization of fields is sometimes preferred, emphasis on an axial motif, which becomes the focus of the decorative system, is most frequent [Mielsch 2001, 9]. This paper will explore the nature and significance of this symmetrical arrangement, endeavoring to show in what way it enhances the imaginary space generated by these fictive worlds.

Indeed, though ranging from total or partial confirmation of the physical limits of the room to their trompe-l'œil opening up and annihilation [Bragantini 2014, 311, 322, 328], Roman painting insists on a rigorous structure of the surface. While First Style wall decorations imitating masonry and inlay materials are laid out in three superimposed zones, in Second Style frescoes complex architectural compositions generating spatial illusion are often symmetrically organized about an axis. Vertical tripartition into a middle and two lateral panels becomes progressively clearer resulting in a centralized

design around an isolated *ædicula* with side wings [Croisille 2005, 36, 58-59, 65, 67]. A similar articulation of the painted wall, with axial symmetry about a framed picture, predominates in Third and Fourth Style decorative systems [Mielsch 2001, 33, 53-55], where elegant architectural fantasies of miniaturist precision are combined with broad areas of plain color. Although the former grand perspectival vistas are first reduced to two-dimensional frameworks, foreshortening reappears in later examples [Bragantini 2014, 359-360].

Regardless of their degree in the use of perspective procedures or flat screens and ornamentation, these architectural worlds are impossible and create a dreamlike, fairy-tale atmosphere [Mielsch 2001, 70; Ling 2014, 370-371], similar to utopian vision. But still, the illusionistic rendering shows that the fantastic was rooted in the real, so as to remain familiar and appear plausible. Symmetry and structure transformed architectural and ornamental elements into decorative patterns, definitively artificial, but harmoniously designed in order to appeal to the eye. They were therefore a means to construct a convincing unreality or a bridge between real world and utopian space.

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THE STROOP EFFECT IN MUSICAL PERFORMANCE

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Abstract
The Stroop test [Stroop 1935] is a neuropsychological test that is internationally considered as reliable and sensitive for the control of frontal activity and executive function. This paper studies the effect of interference. This phenomenon concerns the increased response time or the decreased response speed needed to name the color of a word which refers to different color.

The purpose of the research is the performance evaluation of individuals taught music (learning musical organ experimental group) in the Stroop test (the experimental sample) in comparison with the corresponding performance in the same test by a standard sample of Greek population. Furthermore, the experimental group performance in the Stroop test is evaluated in two periods of the experimentation: a) before the music lesson (*pre_music exam*), and b) after the music lesson (*post_music exam*). The research is of experimental analytical type, cross sectional (i.e. concerns one specific point in time) and layered (*stratified*).

Then the collected data are analyzed and transformed to assume suitable form for the execution of the respective machine-learning algorithms provided by the software package *R*. Furthermore, the parameters of the corresponding set of algorithms are determined depending on the case of application to produce inference rules. Some of the algorithms applied, in accordance to the specific questions of the research, were the ID3 (Iterative Dichotomiser 3) and J48 classification algorithms for the production of decision trees.

The results indicate among others, that the use of Data Mining methods is an important tool to export and receive the conclusions and decisions especially in the field of psychological assessment and in music perception and cognition.

In conclusion, musical performance can be promoted and evaluated by neuropsychological assessment tools and the findings of the present project can be possibly further expanded.

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CRYSTALLIZATION OF PLATONIC-SOLID GEOMETRY HYDROCARBONS CUBANE (C_8H_8) AND DODECAHEDRANE ($C_{20}H_{20}$) AFFORDS GEOMETRICAL CHANGES

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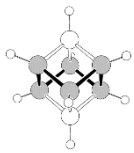
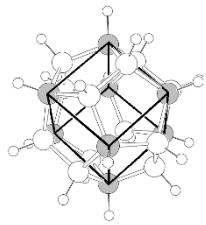
Abstract
The Platonic-Solid geometry hydrocarbons cubane (C_8H_8) and dodecahedrane ($C_{20}H_{20}$) exhibit all their respective 48 (O_h) and 120 (I_h) symmetry operations when dissolved in solution. This point group high symmetry engenders ideal carbon cube or dodecahedron skeletal geometries affording only one Nuclear Magnetic Resonance (NMR) Spectroscopy signal for their ^{13}C or ^{1}H nuclei. However, entering the constraints of a crystal lattice results in subtle, but measurable, changes to generate S_6 and T_h, crystalline-state point group symmetries, respectively. The former cube now becomes an ideal 90 degree puckered hexagon with single carbons triply-bridging each of the top and bottom faces. The former dodecahedron now is changed into an ideal cube with two carbon long bridges to each of the cube's six faces. Solid-state NMR spectra provide visually convincing evidence in the form of two separated ^{13}C signals for on-axes: off-axes nuclei in the respective ratios of 2:6 (cubane) and 8:12 (dodecahedrane), M.C. Escher's periodic drawings provide a foundation in symmetry and crystallography.





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A VALIDATION PLATFORM FOR INS/GPS INTEGRATED NAVIGATORS BASED ON INTEREST PARAMETERS REAL-TIME VISUALIZATION

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Abstract
The paper describes the experimental validation of a low-cost INS/GPS integrated navigator, developed by using some miniaturized inertial sensors (gyros and accelerometers) and a GPS receiver. The development of the INS/GPS integrated architecture uses a data fusion algorithm which aims to estimate the INS position, speed and attitude errors, by using of its own navigation solution along with that provided by a GPS system.

The system developed to detect the position, speed and attitude of the monitored vehicle contains two principal parts: hardware and software. The hardware component includes a strap-down inertial platform, GPS assisted, and able to perform remote transmission of data by using a system of antennas at 900MHz. This is boarded on testing vehicle (Fig. 1), which realized different maneuvers to visualize the real time variation of all parameters of interest. The platform is equipped with three MEMS accelerometers and three MEMS gyros, but also with a GPS receiver with a 5Hz rate. The data transmitted by the boarded system are taken via the receiver of the remote transmission system and provided to a computer via a crossover RS-232 serial cable.

Fig. 1 Testing vehicle and real time monitoring of position.

The information is visualized by using two displays, both connected to the two outputs of the video card of a desktop computer. On the firs display can be visualized the numerical values for strap-down inertial navigation system inputs (acceleration and angular speed components of the carrier vehicle), but also for the navigation solution (position, speed, attitude angles) (Fig. 2a). Moreover, by using the ActiveX technology, the numerical values of the parameters in the solution of navigation are displayed by using some graphic mobile indexes, imitating an avionics system. On the second display can be real-time visualized the vehicle position on a map which is dynamically loaded from the Internet server Google by using web technologies and java script. Positioning the vehicle on the map is done with a red marker (Fig. 2b).

Fig. 2 The information on the first display (a) and on the second display (b).

The application software was developed by using the C# software from the Microsoft Visual Studio package. The serial communication between the receiver of remote transmission system and the computer is monitored and decoded to extract the data of interest. The used software component is encapsulated in class Serial Port. After decoding the data are presented to the user in numerical form by using some Label type controls. For the graphical visualization of the data were used ActiveX controls by type HIS

(Horizontal Situation Indicator), Compass, Artificial Horizon, Climb Indicator, Speed Indicator and Altitude Indicator. The visualization of the position is possible with Java Script and web technologies, used together with a web type control in the second window of the application.

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SYMMETRY IN CONTEMPORARY MUSIC

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Abstract
Contemporary music creation is based on the symmetrical form and structure of melody, harmony, tonality and rhythm. From Gustav Mahler's and Richard Strauss' post-romanticism, Claude Debussy's and Maurice Ravel's impressionism, Arnold Schoenberg's, Alban Berg's and Anton Webern's twelve-tone technique up to the representative composers of the 20th and 21st century, such as Olivier Messiaen, Benjamin Britten, Karlheinz Stockhausen, John Cage and George Crumb, symmetry pervades the works of the great contemporary composers. This is done in a different way than in the great masters of the Baroque, Classical and Romantic eras. Nevertheless, symmetry continues to be the cornerstone of contemporary music that still defines the form, construction and ultimately the aesthetics of music creation.

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REPRESENTATION AS A MENTAL IMAGE

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(2013) Frege's Foundation of Number. *Kutadgubilig* (23)
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Abstract
In this paper, I would like to contrast Kant's conception of 'Vorstellung' (representation) with Frege's understanding of 'Vorstellung'. Kant considers representation as a basis for the *a priori*. Consequently, for Kant a representation is an objective possibility for knowledge. Contrary to Kant, Frege interprets representation as a subjective mental image. For Frege a representation corresponds to a uniqueness that not be shared with other people. Therefore, Frege's understanding of objective knowledge and the *a priori* is not related with representations. Thus, my paper aims to give an account of how Kant's and Frege's divergent concepts of representation determines their understanding of the *a priori* and foundations of judgement. Accordingly, I will undertake an attempt to make an assessment of the term 'Vorstellung' in Kant and Frege.

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WEB-BASED ENVIRONMENTAL SOUNDSCAPES FOR CROSS-CULTURAL DISSEMINATION OF MUSICAL HERITAGE AND TOURISM PROMOTION

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Abstract

The aim of Sound Tourism is to motivate people to visit new places – landscapes, outside the limits of their daily subsistence, which is necessary and to some extent a lure or even mystery. Tourist products are intangible in nature as it is impossible to experience a place without visiting it. However, a soundscape will be able to create a positive association with a particular location. The same way that an image can create the appropriate stimuli for everyone, likewise the sound, which is another tool of tourism marketing, maybe could trigger corresponding feelings for a tourist location. Specifically, music or sound can work with visual elements to cue a cultural context that frames the meanings of communicated messages. These soundscapes can be combined with images or narration to be more explanatory, or integrated with music to give more refined artistic impression of a specific place. The appreciation of music involves a complex combination of the brain's memory, language, auditory and emotional centers all working together – perhaps it is simply this satisfying, harmonious brain-exercise that gives to the potential tourist the pleasure to choose in an effective way a specific tourist destination.

Music is much more rooted in primitive brain structures than language - structures connected with motivation, reward and primal emotions. It is interesting to note that people from a diverse range of cultures and backgrounds will often agree on whether a piece of music sounds happy or sad – for this reason music is often considered the universal "language of emotions". Human behavior is in focus of many tourism researchers. Therefore it is necessary to analyze tourism not only from the economic-

geographical point of view, but also analyze behavior of tourists when they have to choose a tourist destination for their holidays. Key elements from tourism psychology perspective are motivation (needs), expectation, decision making, satisfaction and experience, including analysis of relations.

This paper presents the design and implementation of a web-environment interface, aiming at the remote experience and dissemination of musical cultural heritage and environmental soundscapes to the public, utilizing the latest technology available. The architecture of the application consists of a server database containing the audio data collected and a web-CMS (content management system) platform that allow multiple web users to enter in the specific web-environment interface developed for a wide variety of devices. Audio data consists of sound recordings of traditional and folk music, church music or sounds from folk cultural events. The technical side of implementation includes the music presentation of selected audio data out of the recorded material in a modern web environment for optimal management and tourism dissemination of all the collected material from Audio-Visual Ecology and Ionian Music Archive (IMA) projects (#D10, D12 /MIS35600 - EU funded).

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ART AS A HEALING FORCE: SYMMETRICAL REFLECTIONS

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Abstract

Already a profound questioner at the age of ten, Hirsch wrote to Albert Einstein asking how he could reconcile being the greatest scientist in the world, while, as she had read, believing in the wrathful god of the Old Testament. His reply included this advice: *"Try to form your opinions always according to your own judgment."* This simple yet startling

exhortation became the guiding meter of her life. Growing up, she continued to be mystified by the incongruities she observed around her, and developed an interest in science while (quite by accident) becoming an artist. Her fascination with these two supposedly very different disciplines led to an ongoing inquiry into the relationship between the two, and ultimately to her understanding that the *artist brings abstraction into form,* while the *scientist brings form into abstraction.*

Couched in the disciplines of anthropology, psychophysiology, psychiatry, psychoneuroimmunology, philosophy/ theology and art, this presentation focuses on imagery as a powerful vehicle for physical and emotional healing. Her blending of science and art reveals existing relationships between form in nature, form in human physiology and behavior, as well as the forms that are present universally in all alphabets. Drawing from her years of solitary wilderness sojourns, biomedical and neuroscientific research dealing with mind/body patterning, as well as her experience in diverse world cultures, including Tibetan Tantric visualization and Cabala, Hirsch addresses the hardwired wisdom of the body as the repository of intuition and intrinsic knowledge – leading toward health and behavior benefiting the greater good.

Images of Hirsch's paintings can be seen at www.gilah.com

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GEOMETRIC LOGIC

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Abstract
Geometry is essentially a hyper-dimensional logic. It does not always need equation and syllogism. The syllogism is just one-dimensional logic. Geometric logic is art and imagination beyond the syllogism; it is full of discoveries. It should be the language for architecture and music.

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CONSPIRING WITH NATURE: THE AESTHETICS OF ECOLOGICAL DESIGN AND KINDERGARTEN OF THE FUTURE

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If you are thinking a year ahead, plant a seed.
If you are thinking a decade ahead, plant a tree.
If you are thinking a century ahead, educate the people.
Anonymous Chinese poet, 4th Century BC

Abstract
The past two decades have witnessed a resurgence of ecological ideas and ecological thinking in discussions of urbanism, society, culture and design. In science, the field of ecology has moved away from classical determinism and a reductionist Newtonian

concern with stability, certainty and order, in favor of more contemporary understandings of dynamic systemic change and the related phenomena of adaptability, resilience and flexibility. Increasingly these concepts are seen as useful heuristics for decision-making in many fields, and as models or metaphors for cultural production, particularly in the design arts. This places landscape architecture in a unique disciplinary and practical space – informed by ecological knowledge as an applied science, as a construct for managing change, and as a model of cultural production or design.

Today just about all architects put sustainability near the top of the list of project design goals. Sustainability is on practically every conference agenda related to design, planning, construction and real estate development. But what does it mean to create sustainable architecture? Dictionaries cite the adjective "sustainable" and the noun "sustainability" only after offering several definitions of the verb "sustain": to support, to keep up, to keep going, to provide for by furnishing means or funds.

Architecturally, the sustainability ideal lies elsewhere. It is about conserving energy and material resources, safeguarding the health of occupants, and protecting and enhancing the natural environment. Sustainability in architecture and interior design means minimizing not only the waste and pollution generated by buildings, but also that attributable to their construction and product development.

"Organic Architecture" and "Environmentally-Responsible Design" are charged, popular, phrases, but how are they defined in the context of contemporary design methodology? Is organic architecture simply a formalism of fancy, full of "faux-naturale" shapes and geometric excesses, based in a theoretical construct of analogously relating to nature?

"Ecological design" is a commonly used term these days, but it isn't a separate branch of design, or an optional add-on to an existing design. In this day and age, all design should be sustainable – in terms of environment, economy and society.

Examining ecological design in tandem with landscapes of notable aesthetic quality elucidates the difficulties in reconciling their conception of visibility, temporality, reiterated form, expression, and metaphor. Consideration of these realms of contention suggests a culturally persuasive aesthetic of ecological design and a reassessment of its philosophical foundations.

Some see ecological or spiritual design as a limitation to creation, but design, environmentalism and philosophy can go together very well. To achieve that, we must design entirely from an "ecological harmony" a "circle of life" point of view; get inspired by nature and by the complexity of how human mind and soul is "working", how it is re-acting on the surrounding.

According to the United Nations, our designs need to meet "the economic needs of the present without compromising the ability of the planet to provide for the needs of future generations". As designers, we have the ability to create value out of absolutely anything. It's all in how you package it and present it to people. In other words, it's much more than just sticking a "green" label on existing products. It involves function, material and aesthetic choices, and it is important to make the eco-choice the better and prettier one.

Sounds like a tall order. Can design really save the world? In this article I'll take a look at eight concrete ways to make sure your creations meet the demands of sustainable design.

While seeking a critical framework to evaluate trends in new learning environments discovered there is little published scientific research study and experiment have been performed in combination of education, architecture and interior design literature that interrogates the interior design of kindergartens connection with children development and the role of the designer in assisting a preschool community to identify its needs.

One of the greatest tasks for society then is to equip children with the attitudes, values, knowledge and skills necessary to rethink and change current patterns of action and to secure healthy, just and sustainable futures for all. Environmental education is vitally important for this. We don't want to drag children out from the society, but we want strong children with strong soul prepare to the outside world. So they can go out and change things! If we show too early the bad side of the world and they cannot do anything about it yet, their soul will cry.

Children have a natural ability to go out try themselves, be creative and make mistakes. Children are not frightened to be wrong. And by the time they became adults most children lost this ability. Children who enroll to school this year will retire by 2065. No one knows what future they will have and what exact ecological and environmental challenges they may face. But we mean to educate and create educational environment for it. Today's mainstream education believes in emphasizing literacy and academic knowledge and backing up this ideology with an environment dominantly reinforcing these skills and abilities.

The challenges are great, but with an environmental education perspective in early childhood and early childhood practices informing environmental education, I believe we can create positive change for better futures. This comes from a committed belief that the future is not some place we are going to, but one we are creating. The paths to it are not found but made. And the activity of making them changes both the maker and the destination.

I would like to finish with a quote by Jonas Salk, who said, "If all the insects were to disappear from earth, within 50 years all life on Earth would end. If all human beings disappeared from earth, within 50 years all forms of life would flourish" [Salk, 1981] – what is says to me that we must rethink and reconstruct our mission and function on earth and the way to create education environment to "produce" responsible, solution-oriented, ecological thinking, creative, balanced whole beings.

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The Logics of Image: Visualization, Iconicity, Imagination and Human Creativity
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THE ICONIC PEIRCE: GEOMETRY, SPATIAL INTUITION AND VISUAL IMAGINATION

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Background

The American philosopher and founder of semiotics Charles Sanders Peirce (1839-1914) overlapped the life of Hermann Weyl (1885-1955); and the two thinkers shared some fundamental views about the nature of mathematics and of reality. Both were interested in the continuum; and both advocated for a continuum that was not an aggregate of points. Weyl and Peirce found topology to be an important, controversial branch of

mathematics—indeed, Peirce maintained that topology and continuity were fundamental to his entire philosophy. Both men explored the foundations of mathematics; and also examined questions regarding the role of intuition in mathematics. Both were attracted to aspects of idealist philosophy; and both were strongly influenced by Kant's Critique of Pure Reason. Finally, both Peirce and Weyl viewed mathematizing (the practice of mathematics) as a creative activity. I offer these comparisons here in order to suggest, in a general way, that Peirce's work may offer "food for thought" to those interested in symmetry theory.

Abstract
The notion that visual images may be brought to bear in mathematics and logic in an heuristic manner is familiar: some people simply prefer to use images for reasoning rather than using sentential representations such as words, symbols, and propositions; and some people display enhanced skills for observing pictures, surfaces, rotating images, thickening boundaries, etc., in the imagination. However, the American philosopher C. S. Peirce (1839-1914) carried the value of visual thinking a step further. Arguing that perception is a result of unconscious inference; and that mathematics, as "science of the eye," involves visually perceiving non-propositional, iconic images in order to infer deductive conclusions, Peirce challenges a number of traditional views. Must inference, by definition, involve transitions from proposition to proposition? Can we articulate a visual-spatial logic, as against the dominant discursive logic, embedded in language? Do we, humans, best understand ourselves as uniquely discursive beings? Or, more broadly, as semiotic beings who, along with the rest of nature, may interpret signs deductively? This account of non-verbal, mathematical reasoning using icons allows perceptual and bodily aspects of our thinking processes to be integrated into a theory of reasoning, as well as offering hints about the nature of creative mathematizing. In this paper, I argue that, according to Peirce, topology offers a key to the logic and phenomenology of continua (e.g., space, time, motion). He suggests that the method of reasoning about continua may be described as a form of visual thinking. The continuum is experienced as continuous immediately by intuition; and this is analogous to the way we visualize and reason about (either in the imagination or "on paper") topological and other 3-D objects and spaces. The convention of visualizing images as an aid in drawing conclusions (what Peirce calls "diagrammatic reasoning") apes' natural visual reasoning processes, including the assumption of a continuous visual field. On Peirce's view, topological reasoning requires 3-D visual imagination that cannot be characterized as a set of discrete stages or steps of exact (logical) reasoning. Instead, visual thinking is essentially nonverbal, "continuous," and technically vague. The keys to Peirce's argumentation here are found in his 1) theory of perception and 2) theory of signs. According to Peirce's theory of signs, icons are "degenerate" signs that refer to their objects by virtue of similarity. For example, a photograph, a portrait, or a scale model are iconic signs that resemble what they represent. In mathematics, a geometric circle drawn on paper is an icon of the geometrical form; and the icon is "the mathematical sign par excellence." Mathematical reasoning offers the purest means of exploring the nature of iconicity because mathematics concerns forms of relation simpliciter and these forms can be directly read from the diagram, icon, or image.

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FROM THE THEATRE OF THE WORD TO THE THEATRE OF IMAGE: A RITUAL PERFORMANCE OF INITIATION

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"Glass Menagerie" by Tennesse Williams, Greek Cultural Center of New York

Abstract

Vasilios Kallitsis' Directing approach to Theatre

As an early actor and theatre director, for a number of years I had been exposed to major classic playwrights like Euripides, Anton Chekov, Tennessee Williams, Arthur Miller, Harold Pinter, Samuel Becket and many others that illuminated my life and my perspective to human behavior and its nuances. These craftsmen, because of the magnitude of their work and the genius of their artistic capabilities, introduced me to the "Daedalus" of the human psyche and did take me through the light and the dark side of human actions, into the endless possibilities of the "cosmos" that surround us, on the physical and the metaphysical existential race to achieve harmony with oneself, to battle our daemons, to gain wisdom and knowledge.

As a natural departure, I have had the choice of entering the world of Homer's as a director *Odyssey* and diving into the mythical journey of Ulysses, or getting in contact with the Ancient Greek Mysteries, and specifically the Eleusinian Mysteries, confronting the sacred ceremonies of my Greek heritage. I did decide for the latter. That was an extraordinary journey that took a long time since I was a very methodical researcher. Eventually the "Mysteries" introduced me to a very different reality that prevented me

from any easy questions and answers and led me instead to major themes, like "know thyself" and the quest for "the Elysian Fields". The outcome, six years later, did produce an ecstatic "performance" that changed me as a human being and brought to the participants, actors and dancers, a certain form of "Illumination". This may manifest itself not only for a short period of time on stage, but also throughout the persistent struggle to realize the "unknown", in the process of "being".

Didaskalia Review – The World Mysteries: The Mysteries of Eleusis (Excerpts)

The absence of myth is the myth of modernity. The call for a rebirth of myth through ritual performance has influenced much of the most innovative twentieth-century theatrical experiments. In a tradition which may be traced from Nietzsche, through Yeats, Artaud, Grotowski, and Brook, *The World Mysteries: Mysteries of Eleusis*, directed by Vasilios Calitsis, attempts a production of the sacred through ritual. Any attempt to produce the sacred in our time must acknowledge the absence of any common significatory (i.e. mythological) system. Indeed, much of the power of *Mysteries* is to be found in its use of empty signifiers – the possibility of meaning betrayed by contextual displacement.

[…] From what little we know of the Mysteries of Eleusis, they centered on the myth of Persephone, daughter of Demeter and bride of Hades. This myth could be seen at the core of Mysteries, but the Initiates are the protagonists of the piece. The basic "plot" and structure of the performance is summarized in the program:

> A traveller from a distant and futuristic world is transported to the ancient times revealing certain cultures of our world. As the traveller journeys through time, he weaves the cultures. The performance is divided into five parts, The Purification, The Myth, The Initiation, The Illumination and Divinity

Without this explanation, Mysteries is no more than beautiful chaos. Likewise, some knowledge of the Demeter-Persephone-Hades myth seems necessary. The appearance of meaning either attracts or repulses the audience member, drawing one into its spell, or turning one away.

As the audience finds their seats, a recorder is played by a man in a monk-like habit as a man covered in gold slowly moves through what appears to be tai-chi movements; both at opposite balcony archways. As the lights lower, the golden man moves down to the play space proper. At the center-front of the stage are five concentric circles with hieroglyphs (according to a news release, this is a reproduction of the Disk of Phaestos, which remains undecoded). Behind the hieroglyph circles a small stone stool is at center stage, three scrims at either side for the performers to make their entrances and exits. At the center-back of the stage is a tall arch-like structure. The effect of the set design is reminiscent of Artaud's appeal for a sacred architecture for the Theatre of Cruelty. Although working within the limits of the proscenium layout of BAM's Majestic Theatre, the set makes it clear that naturalism should not be expected; that the performance space has become (once more?) a sacred space.

Likewise, expectations of a dramatic performance, in which characters communicate a linear narrative through scripted dialogue, are quickly dashed as nine "priestesses" move across the stage with ritualized gestures. Throughout the performance the priestesses function as a mostly silent chorus, while a recorded soundtrack - at times inaudible - of a male voice (that of the director Calitsis, identified in the program as "Hierophant") and a female voice (Irene Worth, the "Mystagogue") delivers fragments from Aeschylus, Euripides, Homeric hymns to Demeter and Persephone, Heraclitus, and Plato from Greek antiquity, as well as passages from the Bhagavad Gita, Solomon, John, and T.S. Eliot. Again, the audience would have to refer to their program for a collection of excerpts, and this collection is surely not all-inclusive.

Only through understanding the Future Initiate as a traveller weaving sacred traditions through various times and cultures does any of this make any sense …

[…] What was most striking through the performance was the intense concentration and discipline of the performers. As they moved through a trance-like, meditative state, it was clear Calitsis is after a unique performative consciousness - an invitation to *ekstasis*. The choreography was dazzling in its precision, as images flowed organically. But if the play/ritual is to perform a ritual function, it must be true to the religious etymologically: the actors and audience must come together. Grotowski, whose work Calitsis's most resembles, makes it clear in Towards a Poor Theatre that the size of the audience must be restricted. The nine hundred seat BAM Majestic, though designed with Peter Brook's Mahabarata in mind, necessitates a more commercial approach that the Mysteries, one assumes, eschews (still, oddly enough, when seated high in the balcony the effect was more powerful than when seated in the seventh row - so powerful was the piece I had to see it twice!) …

[…] Indeed, at the end of a hallmark week at the renowned centre for experimental productions in the US, in which executive director Harvey Lichenstein announced his retirement, *Mysteries* would appear to be a crowning achievement. […] It was clear that from the actor's perspective, this exercise was authentically transformative. Bringing theatre back to its ritual origins, *The World Mysteries: Mysteries of Eleusis* offered its audience ontological uncertainty in the midst of aesthetic majesty. The subject remains no less esoteric.

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THE PARASEMANTIC NOTATION OF BYZANTINE MUSIC AND ITS UNDERLYING MATHEMATICS OF FRACTIONS

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Abstract

The notation of Byzantine music is different from the ordinary European music notation. Instead of designation of the actual note that is about to be performed, which is the case of the notation on the pentagram, Byzantine music notation uses parasemantic symbols, which designate the direction and the music space between the preceding and the successor note. In fact, notes in Byzantine music are called *voices*. Actually, Byzantine music traces back to ancient Greek music, notably Pythagoras, who established music as a science, modeled upon mathematics. In the mathematics music, the concepts of the whole and fractional numbers are present in many aspects, such as the rhythm, note duration, space between notes, in amendments and in symmetry in musical motifs etc. The mathematics used in Byzantine music enables a composer to overcome some obstacles, with which European music composers have encountered problems. For example, modern composers in their effort to surpass these obstacles, tried to develop the atonal system or the twelve-note musical scale, which however both sound not very well and it is hard to listen by an immature listener. Byzantine music actually has a twelve-note musical scale, which sounds very well, but differently than the European music; it

also has musical scales with 5 notes, 8 notes, 9 notes, 15 notes and more. This is because the philosophy of Byzantine music is different and Byzantine music use appropriate mathematical tools. In the paper, we present the mathematics underlying Byzantine music together with the parasemantic notation of Byzantine music.

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VISUAL REASONING IN ENGINEERING DISCIPLINES

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Abstract
Scientists and engineers need to be able to communicate their work to multiple audiences (other experts in their field, collaborators in other disciplines, and the general public), and the public needs scientists and engineers to communicate their knowledge and reasoning clearly and effectively. Yet, for students beginning their studies in Engineering, an integrated understanding of the ways new concepts and methods connect to each other can be a challenge that delays their overall understanding of Engineering as a larger discipline.

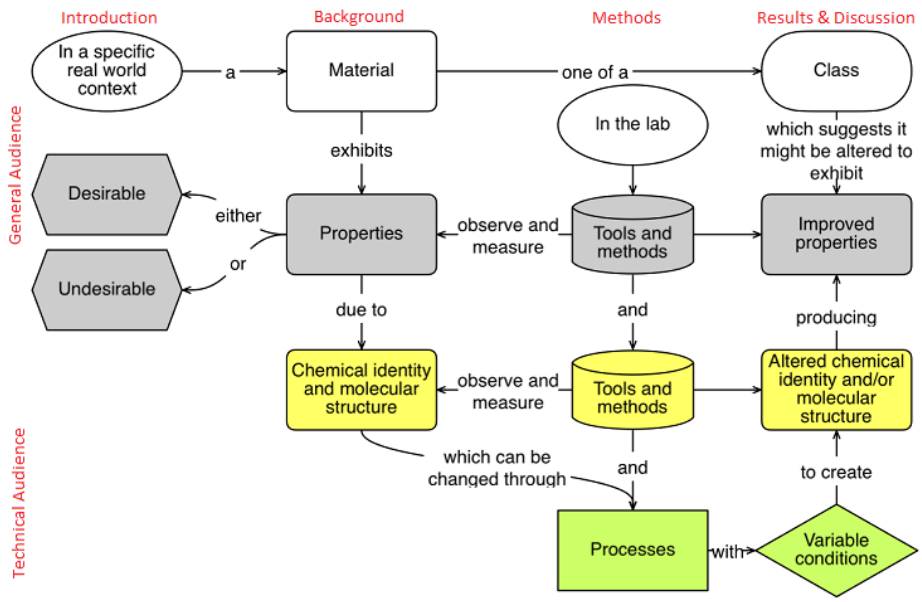

Figure 9. Materials Science Engineering Reasoning Diagram

At MIT's Writing, Rhetoric and Professional Communication program, we have been experimenting with instructional methods, especially those that aid in conceptual understanding and metacognition. Recently, we piloted a visual diagram for Materials Science Engineering (see Figure 1) that maps central disciplinary concepts as well as the logical relationship between them, thus revealing the underlying pattern of reasoning that is necessary to communicate work effectively for various audiences. This diagram explains, in a simple visual form, the abstract relationship between materials, properties, molecular structure, engineering processes, and methods of measurement and analysis; it also provides a model for how to explain these relationships for different audiences and genres. Mapping a specific research project onto the reasoning diagram then provides a means to integrate the conceptual and procedural domain knowledge from both engineering and communication.

Preliminary assessment of instruction using this "reasoning diagram" shows significant increases both in students' disciplinary understanding, and in their ability to communicate effectively (Lane et al. 2015). Because reasoning diagrams map the logical relationship

between central concepts in a field, they help introductory students grasp a systematic framework for learning the content and information, provide a scaffold for critical thinking and reading in the field, and help students learn to communicate disciplinary ideas and research effectively.

The proposed presentation will describe the methodology behind the development of such reasoning diagrams, their application in MIT classroom across the institute, as well as the implications that this new visual tool for mapping disciplinary knowledge can have for our understanding of scientific reasoning and problem-solving.

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LEIBNIZ AND SYMMETRY

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Abstract
The paper looks at some recent discussions on Leibniz's thought and symmetry in the philosophy of science and tries to distil some important ideas that may prove fruitful for modern notions in this respect. Certain core principles of Leibniz's can be developed or extended in ways suitable for the study of (discrete) symmetry, esp. in relation to well-known theses of his on indiscernibility, intrinsic/extrinsic denominations, etc.

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METAPHYSICS OF POETRY FROM METAPHOR TO IMAGE IN TERMS OF THE RELATION BETWEEN THE POET, THE POEM, AND THE READER: CAN IMAGE BE THE BUILDING BLOCK OF LANGUAGE?

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Abstract
The most concentrated use of language is in the dialogue between ego and the inner voice, which we call *monologue*. Considering particularly the Second New poetry movement in Turkey, we can say that the main basis for the formation of poetry is our monologues. Ego and the inner voice are always together within time and space, and both of them understand the images of the memories in the same way. Therefore, in this communication, "image" is preferred instead of "word" which has a low conductivity. In the communication between ego and the inner voice, the main building block of language is "image", rather than "word".

The poet creates his/her own poem by reducing his/her "images" into "metaphors". In this regard, the process of writing a poem can be defined as turning images into words,

or in other words, symbolization of the image using metaphor. For this very reason, at the beginning of poetry is the image.

The power of expression of metaphor is quite low compared to that of image. Therefore, the poet cannot reduce all of the meaning contained in his/her image into the poem. He/she cannot fulfill his/her image exactly using metaphor. This is the main obstacle preventing the poet to share his/her "meaning".

Whereas the reader imagines something only by reading the metaphor without being able to see the poet's image. In other words, he/she searches his/her own image that would correspond to the metaphor in the poem. With this regard, the metaphor refers to two different images: the poet's and the reader's. Can these two images be the same image?

Taking "image" as the building block of language enables a different point of view for the issue of meaning in poetry. In our study, we will discuss the problem of meaning in poetry, in terms of the poet-the poem-the reader.

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SYMMETRY AS HUMAN CREATIVITY: THE CASE OF PHOTOGRAPHY

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Abstract
Symmetry in photography brings forth the exact correspondence of form on the opposite sides of a dividing line. Either of the parts can be a mirror image of the other one. There are many techniques to strengthen or weaken the symmetric properties of an object or a scene. The most important among them is "how much of a scene you choose to show." The position of the camera in relation to the subject, its height, tilt, etc. also could be effectively used to strengthen or weaken symmetry.

A photographer of symmetrical themes attempts to present something that only talented photographers can do – to interact with the facts and touch the hearts of the onlookers with his/her photos. You change them since they have looked at the photos and because they have seen them. So we can say that symmetrical photographs are the 'hidden' portraits of nature and human creativity and as we have learned from Edward Steichen (1879 – 1973): "A portrait is not made in the camera, but on either side of it".

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ARE THERE IMAGES OF THINGS IN HUMAN MIND? THE PROBLEM OF MENTAL IMAGES (a holographic theory of consciousness)

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Abstract:
We would examine the *problem of (natural) mental images*. Two main theses have been propounded:

a) Mental images are the outcome of imagination (Plato, Aristotle, Kant);

b) No mental images are there in our mind (Husserl, Sartre).

I will argue that these two opposite views can be reconciled by means of the holographic theory of consciousness.

(1) **The Primary Thesis**. It seems obvious and indisputable that in our mind (consciousness) there are *images* in the form of certain *mental pictures*. If one closes his eyes, he can "see" the image of the table before him; during night one "sees" dreams in the form of a string of mental images. Plato, for instance assumes the existence of a "painter" in our mind, who draws these images (Plato, *Philebus* 39b). Aristotle talks about

imagination (*φαντασία*) as a special cognitive faculty (Aristotle, *De Anima [On the Soul]*). Immanuel Kant suggests a synthesis by postulating the existence of two modes of imagination – the *productive* and the *reproductive* – as intermediary cognitive faculty between the *phenomenal* that is associated with our sense-perception and the *noumenal* that is associated with what is completely unknowable through human sensation.

(2) **The Opposite Thesis**. The Principal Thesis of mental images as "reflections of real things" was widely criticized in the 20th century philosophy. Notably, Edmund Husserl, in his *Logische Untersuchungen* (Halle 1900–1901), severely criticized "the *picture-theory*" (die *Bilder Theorie*) and claimed that no images of things are there in our mind. This line of criticism was further advanced by Jean-Paul Sartre in his *Imagination: A Psychological Critique / L'imagination* (1936). This criticism found serious psycho-physiological (cognitive) support in James J. Gibson's ecological approach to the problem of visual perception.

Thus, a dilemma has been shaped in philosophy: one has either to admit the existence of mental images (a la Kant) or to reject their existence (a la Husserl). How this dilemma can be solved?

(3) **A new approach** to the study of the possible ways of solution of this dilemma was developed during the second half of the 20th century. It is connected with the theory of "artificial intelligence" (cognitive science), advanced in two opposite directions by Stephen Kosslyn and Zenon Pylyshyn.

(4) My report will be devoted to the discussion of the problem of mental images (are there exist in human mind or not?) and explore possible ways of solution.

Firstly, we note that the theories of Kant and Husserl are not mutual exclusive. Kant (respectively, the European philosophical tradition, represented by Plato, Aristotle, and others) are talking about "images" as outcome of imagination, whereas Husserl and Sartre are talking about "images" as "pictures" of things. Thus, Husserl and Sartre do not reject the view of images as outcomes of imagination (i.e. centaurs, mermaids, etc.) or dreams.

Secondly, a solution to the problem of mental images (in the direction of a synthesis between the Primary Thesis and the Opposite Thesis) can be obtained, in my view, by appealing to the *holographic model and consciousness*, advanced, for instance, by Nicholas Humphrey, which assumes that our mental images are not the initial stage of our perception of reality (as postulated by Aristotle, Kant, and others), i.e. visual images on the retina of our eyes, "viewed" by our mind, but a later product of mind's activity, i.e. "inventions" of the mind, created in response to stimulating data of perception or the activity of our imagination (for instance, in beautiful pictures and / or in the texts of literature).

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NATURAL HEXAGONAL PATTERNS AT NANO- AND MACRO-SCALES: FROM GRAPHENE TO GIANT BASALT PRISMS

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Abstract
Periodic patterns of hexagons (honeycomb packing) observed in naturally abundant and artificial materials have captured human imagination for centuries.

Graphene is the best example of the ultimate limit for such a pattern at nanoscale. Graphene is a single layer of graphite or a one-atom-thick two-dimensional (2D) material composed of carbon atoms on a honeycomb lattice [Geim, 2007]. The honeycomb structure of the material is responsible for its unique electronic properties [Castro Neto, 2009].

We consider formation of giant six-sided basalt columns as an opposite ultimate limit for such pattern (at macro-scale). This pattern arises from a network of shrinkage cracks that

develop during the cooling of solidified lava. The cooling starts from the top and the cracks follow the temperature field into depth, since thermal shrinkage provides the driving force for the crack propagation. Recently, the detailed physical mechanism for such process was suggested (Hofmann, 2015) as well as some similar periodic hexagonal patterns were demonstrated to produce artificially at micro-scale [Kattouf, 2015].

Figure 10. Dense packing of hexagonal basalt lava columns in The Giants Causeway, Northern Ireland. Photo by E. A. Katz

After review of the above physical consideration of these fascinating phenomena, the particular qualities of forms of various giant hexagonal prisms and their dense regular packing will be discussed on the basis of their photographs made by the author in the Northern Ireland, Israel and Chile (Fig. 1-3).

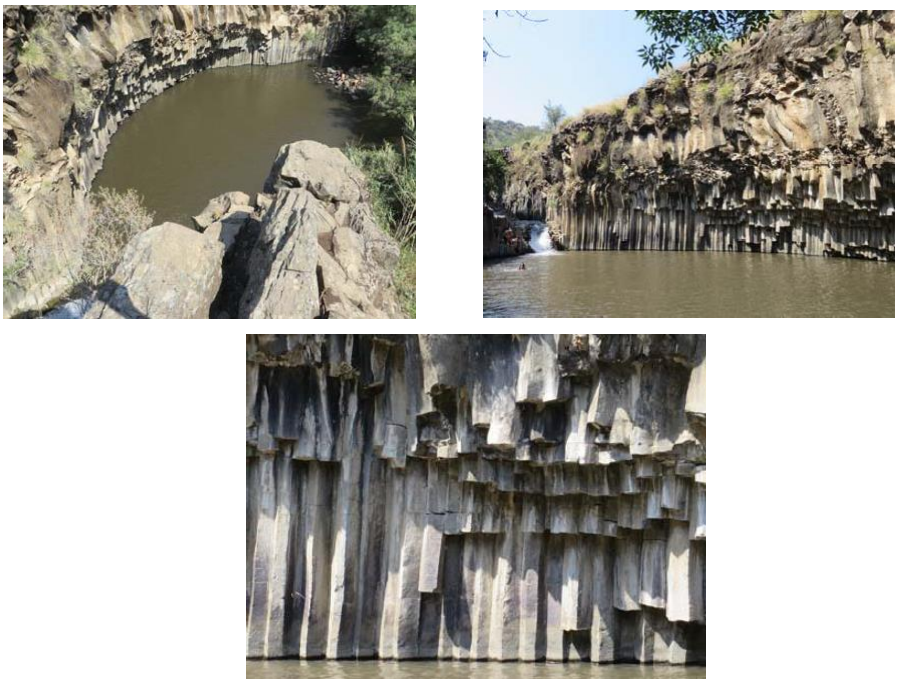

Figure 11. Dense packing of hexagonal basalt lava columns in the Hexagons pool, Golan Heights, Israel. Photo by E. A. Katz.

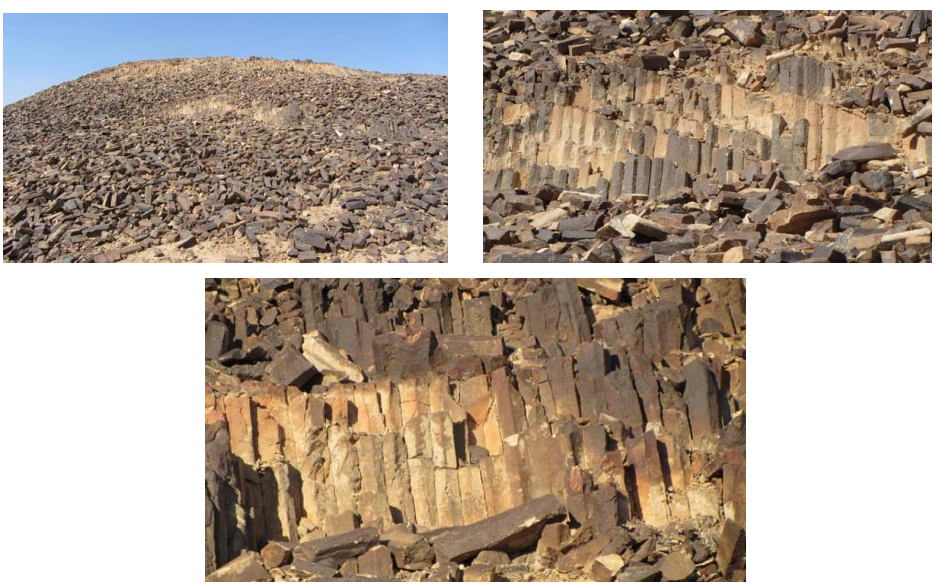

Figure 12. Sandstone prisms in canyon Mahtesh Ramon, desert Negev, Israel. Photo by E. A. Katz.

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PANOPTICISM AND SYNOPTICISM IN DYSTOPIAN CINEMA: THE MINORITY SURVEILS THE MINORITY SURVEILLING MAJORITY

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Abstract
French philosopher Michael Foucault (1926 – 1984) used Jeremy Bentham's his time-surpassing ideal imprisonment project – the *Panopticon* – as a metaphor. According to Foucault, feeling the possibility to be surveilled, the potential observer self-interiorizes the power relations and starts to discipline its actions according to implicit rules, "he becomes the principle of his own subjection" [Foucault 1995, 202]. If in the *Panopticon* the asymmetry of the gaze is based on fact that the minority surveils the majority, by contrast, in *Synopticon*, discussed by Zygmunt Bauman, the minority is surveilled by the majority (movies, TV series, TV shows, social networks etc.).

The paper focuses on the relationship between visualization and power. It argues the application of the conceptions of *Panopticism* and *Synopticism* in dystopian cinema research. The questions are: what is the relation between *Panopticism* and *Synopticism*? Has, according to Bauman, *Synopticism* replaced *Panopticism*? If so, then under what

conditions and circumstances? Lastly, what is the minority and the majority? And what kind of roles they play in these conceptions?

While analyzing dystopian movies – "The Matrix", "1984", "Truman Show", "V for Vendeta", "The Hunger Games" series, "Fahrenheit 451", the schema "the minority surveils the minority surveilling majority" is recognized. In reference to Foucault, Bauman, Bentham, Mathiesen, Alan-Miller, Lyon texts, the *Panopticon* and *Synopticon* are compared. The paper draws attention that in the primary plans of the *Panopticon* an important role was intended for the spectatorship and spectator from the outside. To discuss the tension of power relation of the minority and the majority and their importance for cinema, G. Deleuze's minority and majority conceptions are applied.

Deleuze terms a minority, a group of people that does not poses real power, and vice versa. Applying this conception the paper discusses the idea of a *synoptic panopticon*, in which the power belongs to the surveilled. It is stated that a quantitative minority surveils a handful powerful majority, thus marking in itself the principle of power and disciplined itself according to the surveillers dictating rules of behavior and thought.

Applying Fiske's idea of an active and recreating consumer (viewer), the paper discusses preconditions of forming a minority that is powerful quantitatively in its own way. This paper compares that with the Guattari and Deleuze's concept of "becoming-minor".

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IMAGINATION AND KNOWLEDGE OF NECESSARY EXISTENCE

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Abstract
In this paper, I endeavor to provide a precise explanation of the defining contours of epistemic modality. I examine, then, the ways by which epistemic modality enables knowledge of the propositions and entities yielded by necessitist systems of metaphysical modality.

I argue that the inquiry into how epistemic modality and the imagination yield knowledge of metaphysical modality reduces to the inquiry into how the contents of the imagination yield knowledge of modal systems and their metaphysical consequences. I provide a precise account of the nature of mental imagery and its relation to propositional imagination. I argue that mental images are phenomenal properties, defined on Bayesian state spaces. Along with being both *de jure* epistemically and subjunctively rigid, I demonstrate further how phenomenal intentional properties can be regimented within a category-theoretic semantics. The typed arrows which represent phenomenal properties can serve as a non-descriptive individuation-condition on the intensions which define the values of terms and formulas in epistemic modal space. I explain how – via its interaction with quantification and identity, and, in particular, with haecceity comprehension principles – can serve as a basis for modal logical knowledge, and thus for modal-metaphysical truth.

Further constraints on the semantics for conditional propositions – with propositional imagination figuring as input to the antecedent and consequent of the conditional – can then be outlined.

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DUALITIES, MODALITIES AND INSTITUTIONS

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Abstract
Institutions theory is a universal theory about logical systems. Beyond exaggeration we can claim that nowadays this is the most fundamental metatheory in the field of abstract model theory. Through the institutions theory, it is possible to study in an abstract way the meaning of the modalities and the duality between semantics and proof theory. We will try to highlight the symmetries appearing between logics, in the context of modalities and dualities.

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THE DEVELOPMENT OF SOFT LOGIC

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Abstract:
The mathematician and philosopher Gottfried Wilhelm Leibniz (1646–1716) at young age, envisaged a program to develop a universal language with only one symbol. Later, he changed his mind and searched for a mathematical language with a softer than the bivalent (true / false) logic [Dascal 2008].

In realization of Leibniz's early vision, we developed a unique, innovative approach to mathematics teaching by means of such a language that is based on one symbol only. The underlying idea is that mathematics might be taught beginning from the early childhood, at the kindergarten, but using a different, non-traditional approach. The reason is that at that age, children have not yet learnt mathematics in the traditional way; so their thinking is creative, open and inquisitive and not accustomed to the traditional way of mathematical thinking.

The program is based on a dialogue approach in which the teacher learns together with the children. The children learn the story of mathematics by listening to stories of great mathematicians, inspired by George Spencer-Brown's *Laws of Form* [Spencer-Brown 1969/1979]. We introduced an innovative concept in mathematics, called "Forms of Numbers", that is actually an extension of the various ways of presenting a number as sum of smaller or equal numbers (number partitions).

Further, inspired by the idea of Mobius strip, we have recently developed with Yale Landsberg a new number coordination that introduces a distinction between -0 and +0. This discovery supports Leibniz's second vision to develop a new logic, which will be more flexible than the standard (bivalent) logic, where only two alternatives (true or false) are possible.

The Israeli Ministry of Education has shown interest in the program and initiated a pilot program in 120 kindergartens, which is currently underway.

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PHILOSOPHY IN IMAGES: NAGARJUNA AND QUANTUM PHYSICS. EASTERN VS. WESTERN MODES OF THOUGHT

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Abstract
'Emptiness'. The Indian philosopher Nagarjuna (2nd century CE) is known in the history of Buddhism mainly by his keyword 'sunyata'. This word is translated into English by the word 'emptiness'. The translation and the traditional interpretations create the impression that Nagarjuna declares the objects as empty or illusionary or not real or not existing. What is the assertion and concrete statement made by this interpretation? That nothing can be found, that there is nothing, that nothing exists? Was Nagarjuna denying the external world? Did he wish to refute that which evidently is? Did he want to call into question the world in which we live? Did he wish to deny the presence of things that somehow arise? My first point is the refutation of this traditional translation and interpretation.

'Dependence' or 'relational view'. My second point consists in a transcription of the keyword of 'sunyata' by the word 'dependence'. This is something that Nagarjuna himself has done. Now Nagarjuna's central view can be named 'dependence of things'. Nagarjuna is not looking for a material or immaterial object which can be declared as a

fundamental reality of this world. His fundamental reality is not an object. It is a relation between objects. This is a relational view of reality. Reality is without foundation. Or: Reality has the wide open space as foundation.

'Arm in arm'. But Nagarjuna did not stop there. He was not content to repeat this discovery of relational reality. He went on one step further indicating that what is happening between two things. He gave indications to the space between two things. He realised that not the behaviour of bodies, but the behaviour of something between them may be essential for understanding the reality. This open space is not at all empty. It is full of energy. The open space is the middle between things. Things are going arm in arm. The middle might be considered as a force that bounds men to the world and it might be seen as well as a force of liberation. It might be seen as a bondage to the infinite space.

Philosophy. Nagarjuna, we are told, was a Buddhist philosopher. This statement is not wrong when we take the notion 'philosophy' in a deep sense as a love to wisdom, not as wisdom itself. Philosophy is a way to wisdom. Where this way has an end wisdom begins and philosophy is no more necessary. A.N. Whitehead gives philosophy the commission of descriptive generalisation. We do not need necessarily a philosophical building of universal dimensions. Some steps of descriptive generalisation might be enough in order to see and understand reality. There is another criterion of Nagarjuna's philosophy. Not his keywords 'sunyata' and 'pratityasamutpada' but his 25 philosophical examples are the heart of his philosophy. His examples are images. They do not speak to rational and conceptual understanding. They speak to our eyes. Images, metaphors, allegories or symbolic examples have a freshness which rational ideas do not possess. Buddhist dharma and philosophy is a philosophy of allegories. This kind of philosophy is not completely new and unknown to European philosophy. Since Plato's allegory of the cave it is already a little known. (Plato 424–348 BC) The German philosopher Hans Blumenberg has underlined the importance of metaphors in European philosophy.

Quantum Physics. Why quantum physics? European modes of thought had no idea of the space between two things. They were bound to the ideas of substance or subject, two main metaphysical traditions of European philosophical history, two main principles. These substances and these subjects are two immaterial bodies which were considered by traditional European metaphysics as lying, as a sort of core, inside the objects or underlying the empirical reality of our world. The first European scientist who saw with his inner eye the forces between two things had been Michael Faraday (1791-1867). Faraday was an English scientist who contributed to the fields of electromagnetism. Later physicists like Albert Einstein, Niels Bohr, Erwin Schrödinger, Werner Heisenberg and others followed his view in modern physics. This is a fifth point of my work. I compare Nagarjuna with European scientific modes of thought for a better understanding of Asia. I do not compare Nagarjuna with European philosophers like Hegel, Heidegger, and Wittgenstein. The principles and metaphysical foundations of physical sciences are more representative for European modes of thought than the ideas of Hegel, Heidegger and Wittgenstein and they are more precise. And slowly we are beginning to understand these principles. Let me take as an example the interpretation of quantum entanglement by the British mathematician Roger Penrose. Penrose discusses in the year of 2000 the experiences of quantum entanglement where light is separated over a distance of 100

kilometres and still remains connected in an unknown way. These are well known experiments in the last 30 years. Very strange for European modes of thought. The light should be either separated or connected. That is the expectation most European modes of thought tell us. Aristotle had been the first. Aristotle (384 – 322 CE) was a Greek philosopher, a student of Plato and a teacher of Alexander the Great. He told us: Either a situation exists or not. There is not a third possibility. Now listen to Roger Penrose: "Quantum entanglement is a very strange type of thing. It is somewhere between objects being separate and being in communication with each other" (Roger Penrose, *The Large, the Small and the Human Mind*, Cambridge University Press. 2000 page 66). This sentence of Roger Penrose is a first step of a philosophical generalisation in a Whiteheadian sense.

'The metaphysical foundations of modern science' had been examined particularly by three European and American philosophers: E. A. Burtt, A.N. Whitehead and Hans-Georg Gadamer, by Gadamer eminently in his late writings on Heraclitus and Parmenides. I try to follow the approaches of these philosophers of anti-substantialism. By 'metaphysical foundations' I do not understand transcendental ideas but simply the principles that are underlying sciences.

'Complementarity', 'interactions', 'entanglements'. Since 1927 quantum physics has three key terms which give an indication to the fundamental physical reality: Complementarity, interactions and entanglement. These three notions are akin to Nagarjuna's relational view of reality. They are akin and they are very precise, so that Buddhism might learn something from these descriptions and quantum physicists might learn from Nagarjuna's examples and views of reality. They might learn to do a first step in a philosophical generalisation of quantum physical experiments. All of us we might learn how objects are entangled or going arm in arm.

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"IMAGE OF GOD" AND EARLY IMAGES OF CHRIST: BETWEEN THEOLOGICAL REFLECTION AND PICTORIAL ART

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Abstract
Nowadays, it is widely recognized that, already in its early stages, Christian art and imagery conveyed theological concepts and reflected historical circumstances pertinent to a procedure of Christian culture- and identity-making. However, there is still ground to be covered when it comes to the early theology of the image and its relation to the formation of the early Christological visual imagery and image proper. Interestingly enough, "image of God" was one of the names that the Scripture ascribed to Christ, and it is one which had invited much speculation already in 2nd and 3rd C. apologetic and exegetic writings. In the 4th C., the notion of the image was employed both to explain the relation between God and the man «made in His image» and to define the relation between the Father and the Son within the Trinity. In terms of the Trinitarian discourse, the image became a key word for expressing the relationship between the Son and the Father, and in light of this relationship's reciprocity, the Christian notion of image emerged redefined.

Is it possible to read such theological developments into emergent iconographic themes of the same period? In a more or less traditional iconographic approach, such inquiries

were translated in a preoccupation with «what this or that image signify». But an approach ascribing some sort of autonomy to visual language could prove more fruitful. In this perspective, theological developments of the 4th C. could be regarded as guidelines to help us form an interpretative framework for the doctrinal formulations of that period, within which we could hopefully trace visual imagery's place and role: how it deploys its rhetoric and how, in doing so, it develops and transforms. Or, to put it differently, one could try to explore how theological reflection and visual imagery sought to configure what would become the face of Christ.

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SYMBOLS AS VISUALISATIONS OF ARCHETYPAL IMAGES IN ART

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Abstract
Symbols are visualizations of archetypal images of the unconscious. This study is dedicated to some of the most fundamental symbols in mythological and iconographical tradition, the snake and the egg. A huge snake or a dragon is often associated as a guardian or a fertility daemon with a cave, a well, the Delphic omphalos (Python) or with the tree of life, all symbols of the primordial Mother Earth, and goddess of fecundity. The snake in myth and iconography can represent the primordial water, source of life and equally power of destruction. Snakes can be regarded as symbols of immortality and resurrection because they appeared to be reincarnated from themselves when they sloughed their skins. Snakes were often also associated with immortality because they were observed biting their tails (Ouroboros) to form a circle and when they coiled they formed spirals (both symbols of eternity). In Freudian thought the snake can be interpreted as a phallic symbol. According Jungian psychology, the hero's mythological fights with the dragon are perceived as battles of the regressive forces of the unconscious which threaten to swallow his individuating ego. The monster snake as guardian of a treasure, cave, well (feminine fertility symbols) etc., incarnates the negative forces, the devouring terrible side of the Great Mother and the fear of the incest.

The egg was always considered as the ultimate symbol of life. As the most expressive symbol of life was equally an ideal symbol of fecundity in ancient Greek religion. According several mythological traditions the universe was created from a cosmogonic egg. Orphic Eros, Phanes, a hermaphrodite creature, was believed to have been hatched from the World Egg of *Chronos* (Time) and *Ananke* (Necessity). In ancient Greek Orphic and Dionysian ritual the egg was considered among the most sacred objects because of its cosmogonic symbolism and its bisexual characteristics (the uterus shape containing the sperm). As the snake, the egg was considered as a chtonian symbol, that's why it was a common offering to the chtonian deities (who gave fertility to the mortals) and to the dead as a food containing all the necessary regenerative powers in order to promise a future metaphorical rebirth in the afterlife. The resurrection symbolism of the egg is recognized until our days in the custom of the Easter eggs tapping game between the Christians celebrating the resurrection of Jesus and of all nature during the spring. The exterior of an egg, the egg shell looks like a lifeless object (symbolism of the grave) but its interior hides the promise and the seed of the coming life. The egg including the principle of life and a precious vitality was also conceived as aphrodisiac nourishment during antiquity. As a cosmogonic principle, possessing an original and inimitable form it was also considered as a symbol of perfection.

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THE LOGIC OF BOTTOM-UP AND TOP-DOWN

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Abstract
›Bottom-up‹ and ›top-down‹ (BUTD) are common terms in natural science and humanities: They are to be found, inter alia, in computer science, biology, chemistry, physics, as well as in social sciences, politics or economic sciences in order to analyse or initialize certain theoretical models. Examples of BUTD-models or -descriptions include tree diagrams in formal ontology, a terminological explanation of company structures in management theories, a model of population dynamics in ecology and many more.

However, there are no studies that have directly addressed this issue as many scientists regret. Rauss/ Pourtois [2013, 1] explain that "both terms are ubiquitously used, but only rarely defined". Concerning BUTD, Kaplan/Gurven [2008, 1588] claim further that scientist "could be more productive if they were informed by research at other levels and interacted with scientists with complementary expertise". Thus scholars "may actually become more confused as to the true merits of each approach and their theoretical distinctions" as Kung/Gardiner state [2013, 16].

For example, the confusion can be illustrated by a simple and very general example:

> (NYT) "The New York Times changes from top-down to bottom-up-management"
>
> (KLON) "The lakes in Klondike freeze from the bottom up, and not from the top down"

Whereas (NYT) may usually be understood as a kind of ‘direct language’, (KLON) is usually seen as metaphorical. Furthermore, we have to ask for the relationship between BUTD-terms and there visual representations: Are NYT/KLON-sentences only perfectly understandable if we visualize there structures at least before our mind’s eye? Are NYT/KLON more easily comprehensible for recipients if they are accompanied by illustrations, pictures or models? Many more questions intrude upon us.

In my talk, I will give examples of the terminological, metaphorical and visual use of BUTD. Furthermore, I will make a proposal for a formal semantic in order to analyze different kinds of BUTD-theories.

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PARENTHETICAL WINDOWS: A PROJECT ON HOW ARTIFICIAL LIGHT AND SOUND ARCHITECTURE AFFECT HUMAN PERCEPTION ON NORMS

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Abstract
Parenthetical Window is a project that engages scientific research in human perception providing a platform for users to experience their own limits and needs in their individual circadian rhythm. The presentation focuses on a case study in a community of dancers where the individual needs in light and darkness (activity and rest) are being measured. With the use of gesture recognition devices (e.g. Myo), visual and audio parameters are triggered in order for a chart of a "movement choreography"/ vocabulary to be analysed. The first draft of the research evaluates whether the user can distinguish artificial from natural stimuli and detects common and individual needs by measuring heart pulse and body temperature. The focal point here is light and how light affects human perception while at the same time the perception of sound and how gesture can provide the best possible cognition of actual needs in keeping the internal rhythm when we adjust to artificial environments. A history of how architecture and technology made our perception flexible in what is real and aesthetically beautiful is also documented by individual dancers in interviews. This research endeavours to project the need to engage all senses in multi-sensory projects, and manifests how sound is connected in its absence (where only noise and ambience stimulates the senses), trains the body to regain spatiality, embodied cognition, and how other senses interact in this recalibration. One focal point is the connection of light and artificial soundscape as well, as long as sound is structured (therefore artificial) as a compositional model. The research takes into account the time circle of 24 hours in four groups (morning, noon, evening and night) and proceeds the results of all the above for an artistic project that values all these for the construction of a final installation that focuses on the construction of a dark room that provides artificial stimuli through a window with only artificial information. The abstract translation of sound to image through artificial light is a common endeavour in the history of arts and its aesthetics, since light is a form that adapts natures' properties and modifies the artificial environment as a stage direction, implying at the same time mood and modifying it in collaboration with sound. Having evaluated how this affects the body and human perception in this particular time that we experience nowadays (where artificial is in fashion) what we mostly attempt to value and evaluate within this research and installation is the enantiomorpous pattern of natural to artificial, aiming from the initial stage/ level to organize and manifest what the body perceives as real, and where it measures fatigue and stress instead of calmness and satisfaction, aesthetic as well as corporeal.

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UNDERSTANDING IMAGINATION AS A SEMIOTIC SYSTEM USING NELSON GOODMAN'S THEORY OF ART

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2015. "Why You Can't Imagine the Impossible (But Think That You Can)," *Organon* F 22 (4) 2015: 499-517.

Abstract
In this presentation, a theory of art is used to understand the referential nature of imagination. Specifically, the outline provided draws upon Nelson Goodman's understanding of art [Goodman 1976]. This theory provides the analytic tools to understand phenomena as diverse as pictorial art, musical notation, dance, and other art forms. The theory has also been taken in new ways by a number of other philosophers. Most prominently, Catherine Elgin [1983, 1995]. She, for example, uses the concepts the theory provides to discuss the nature of scientific experiment.

As for me, I believe these concepts can be successfully harnessed to understand how certain aspects of the mind and phenomena related to the mind work. In this presentation imagination is considered. The concept at the heart of Goodman's theory and the concept central to my understanding of imagination is *exemplification*. Exemplification, according to Goodman, is an aspect of reference. But whereas *denotation*, another aspect of reference, goes in one direction, exemplification goes in two. A painting, for example, exemplifies a predicate and that predicate classifies the painting. Thus, a painting that

exemplifies the predicate ‘sad’ is classified as a sad painting. Exemplification explains how things become examples in this way. Applying the concept to imagination means that imagination can be seen as the cognitive capacity to provide oneself with examples that represent possible states of affairs (actual or nonactual). More generally, imagination is thought of as a *semiotic system* and the theory can be successfully related to other semiotic systems, for example, Peirce’s semiotics.

The theory also makes sense of some Kripkean remarks on the imagination and, indeed, defends a Kripkean understanding of imagination [Kripke 1980; Malik 2014; 2015]. Goodman and Kripke are not usually spoken of together, so this may represent one interesting intersection. The theory also fits nicely with the idea that imagination involves imagery or functionally defined imagery [Kosslyn 2010]. A *functional image* is basically a cognitive structure that provides the same kind of information as images do. However, the theory provided is not inimical to thinking of imagination in propositional terms. Perhaps, then, exemplification is more basic than pictures or propositions to the imagination and, perhaps, pictures and propositions are just two different ways of realizing exemplificational reference in the imagination.

Finally, applying the concept of exemplification to other aspects of mental activity may fruitful, for example, in explaining phenomena as different as stereotype threat [Steele, Spencer, & Aronson, 2002] to delusion. I hope to introduce all these themes through this presentation.

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MIND THE GAP

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Abstract

Perception in philosophy is part of the philosophy of mind. This area of philosophy considers questions such as the difference between sensation and perception, perception and belief as well as

connections between perception and action, perception and imagination, etc. These questions remain separate though related to questions of visual perception, though all speak to how the mind works, the place of consciousness, and the relationship between the mind and reality/the world.

Visual perception begins with the mechanics of optics and the brain centers responsible for receiving sensory information. But much more goes on to make up a full experience of perception that carries any level of meaning. Cross-modal conceptualizations, blendings, mappings, etc. together with sensory input and non-perceptual cognition, combine to create experience – one that is related but not entirely loyal to the initial sensory stimulation. Perception, then, seems to be not only cognitively penetrable, but dependent on the imagination

In looking at the variability of reality and the malleability of perception, this project investigates an account of how meaning is constructed through a critical and cross-disciplinary approach. Using as a starting point critical art theory's inquiry into what it actually means to have knowledge of an artwork, this project explores a combination of theoretical research and empirical study to investigate meaning as derived from the physical nature of our brains, our bodies, and our physical experiences.

By examining the structural components of embodied cognition, including metaphor, mapping, and integration, and how they bear on intentionality, we aim to lead to a provocative point where the disembodied voice of analytic philosophy interacts with more embodied aesthetic approaches to knowledge, to form a clearer picture of how meaning is constructed. We intend a collaborative dialogue between art and logic, specifically abstract notions of duality – specifically as it relates to fringe consciousness.

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FROM THE ANCIENT UNITY OF MATHEMATICS, LOGIC, MUSIC, AND FINE ARTS TO THE INTERDISCIPLINARITY OF THE MODERN DIGITAL ERA

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Abstract
In the Western culture there was an important period between in the 5th and 4th centuries BCE. The Pythagoreans linked mathematics and music by studying proportions on the

monochord (one-string instrument). In some sense they presented a model of explaining various phenomena, from musical harmony to astronomy, by ratios of integers. However, they soon discovered the limits of this model: the ratio of a side and a diagonal of a given square cannot be explained by ratios of integers. The proof that something is impossible required a sophisticated logical and philosophical inquiry in ancient Greece. Two lengths could be not only *commensurable* (*σύμμετρα*) as it was assumed, but also *incommensurable* (*ασύμμετρα*). The ideas of *symmetria* vs. *asymmetria* contributed to the birth of abstract mathematics and affected the theory of proportion in sculpture (Polyclitus), and were later integrated in mathematical and aesthetical works (cf., Euclid and Aristotle, respectively). In the same time, the specialization of Western art and science was started and reached a climax in the modern age.

In the Eastern culture, the unity of art and science remained strong for a longer period, as the Yin-Yang also demonstrates how to link two opposite forces. Traditional design, garden art, calligraphy, and the Japanese *sangaku* (mathematical tablets) provide many examples were the artistic and scientific approaches are together. Later, however the Western (over)specialization influenced also the Eastern mode of thinking.

In our time, characterized by the fragmentation of knowledge and many conflicts, there appear some possibilities to create a new unity of art and science, traditional and modern ideas by using the appropriate digital technologies. We will discuss such topics as ornaments and modern crystallography, folk architecture and space research, handicrafts and nano-technology. Although we face various dangers, including the flow of too much, not definitely reliable pieces of information, but with new forms of learning and the usage of advantages of "glocalization" (the harmony between globalization and localization), we may overcome by using interdisciplinary approaches.

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VISUAL THINKING AND THE THEORY OF METAPHOR

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Abstract
In the paper, we will argue whether it possible to understand the nature and functions of visual thinking within the terms of the Theory of Sign (Pierce) and the Contemporary Theory of Metaphor (Lakoff, Davidson, Ricker).

While the idea of the interdependence of thought and language is still remain an emerging topic of discussions, the possibility of a self-sustaining visual (non-verbal) thinking seems rather controversial. Thus, we start from the assumption that visual thinking is a form of associative thinking, and in certain aspects similar to metaphorical thinking because metaphor is also a way of thought before it is a way with words. Although syntax of a language is linear, semantics is able to provide multi-dimensional understanding. A plurality of meanings that actualized during interpretation of metaphorical expressions, contribute to the emergency of multi-vector (non-linear) thoughts, making it close to the processes of perception of visual images. Metaphor is a conductor and a storage of imagery in language, it gives us a much more vivid understanding. Metaphor is a universal translator: we inevitably resort to metaphor when we deal with ideas, emotions, feelings, concepts, thoughts. It can also easily convert a concrete names in the abstract concepts and vice versa.

In our study, firstly, we will underline a formal, structural relation between the metaphor and image, conceiving metaphor as a hypoiconic sign. Then, we will see how metaphor and image both can contribute to the human cognition and introduce new ideas. They are not just the detection of patterns; they create patterns. And finally, we will argue that linear and non-linear reasoning are two different, but not disconnected types of thought processes which are complementary to each other.

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VISIBILITY
INSIDE AND OUTSIDE THE ART SYSTEM: ART AS ACTION

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Abstract
As Mierzoeff [1999] says, visual culture does not depend on the images themselves, but on modern tendency of putting in images the existence. After the Second World War the artists of the Situationist International mostly criticized the thesis that "all that has once already experienced has become mere representation" [Debord 1967]. Concepts like *psychogeography*, drift and *detournement* laid the theoretical foundations of their action.

During the last decades, the field of the system of arts has faced an growth of breaches – fed by conceptualism, situationism, dematerialization, and digital revolution, etc. – that have already been able to put under trial some parameters of the arts [Alonso 2000; Grinstein 2005; Luhmann 2000]. One of the qualities of contemporary art is rooted in the choice of formats by the artists that operate in the borders between the "museable" and the "gallerizable", and the current strategies is the extraterritorial drift, outside the institutions of the art system. Artists develop their practices in the middle of the

community. The city is the place that many of them have chosen to set up their critical devices in this process; it becomes the stage where social problems, often silenced by the system, are displayed. Situationist concepts are present in most of these practices. The aim of this paper is to analyse the current conditions of the experience of the urban space proposed by works of art in Argentina and to point out the contextual aspects of this experience.

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NARRATIVES OF A DESIGNER'S COLLECTION: FASHION SHOWS AND ARTISTIC APPLICATIONS

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Abstract
Fashion weeks have a high importance, since there are new designs to present and a fashion show effect, which sometimes moves before the designs. After creating the whole collection, fashion designers are involved with a new field of area called "fashion show" to present and realize their collection idea in a dramatic and impressive way. Displaying a new collection of a designer in an artistic venue, gives a great excitement to audience.

Fashion shows have a strong impact due to its atmosphere surrounded by music, video art, performance and stage design. This 20-25 minute long shows represent the whole collection with the background idea of the designer and his/her inner world, by using colors, textures, stories, forms and visuals. For this reason, an artistic approach is a necessity to design a show, in order to reveal the most relevant way of a collection's idea.

It could be said that there is a narrative side of each fashion show, though only visuals and sounds speak for the designs. In this paper, images and figures of fashion shows and relationship of arts with the fashion world would be stipulated. Thus, fashion shows and its artistic applications would be discussed as part of narrating a collection.

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THE PLAUSIBILITY OF A NOETIC GAZE IN AN ALGORITHMIC-DRIVEN SOCIETY: STIEGLER AND MASS MEDIA

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Abstract
Bernard Stiegler outlines an inherent relationship between technology and human temporalization, maintaining that humans take their experiences, thoughts, and feelings and exteriorize them through technology. In addition, he argues that the advent of mass media and other advancements in technology have shifted the ways that humans temporalize and perceive with their tertiary memory. Stiegler takes an almost apocalyptic view of this shift, maintaining these media effectively efface secondary and tertiary memory through a constant stream of data, disorientating paradigmatic conceptions of time and consciousness. The shift is further problematized in that this capacity to disorient is effectively monopolized by tertiary memory systems such as film and radio companies. Stiegler contrasts the pessimistic critique of mass media with a positive assessment of the emerging era of digitalization. A new critical culture is ushered in, a culture that both entails the ability to parcel out the continuity of mass media's hypnotic stream and facilitates the capacity of consumers to become editors or producers of tertiary memory themselves. He describes a noetic gaze, or a state of active and critical contemplation that is evoked by the power of digitalization. Stiegler praises the open source as an exemplification of this noetic ideal.

Though Stiegler is right to acknowledge the collective potential for participation in open source, this paper considers rather the possibility that open source itself will instead prove a restraint on judgment. We must consider whether an algorithmic-driven software would actually turn us into noetic beings. This paper will argue that "AI" driven software can in fact restrict idealized autonomous critical judgment even more effectively than industrialized consumerism. Stiegler's failure to recognize the potency of the AI in this

respect reflects the implausible anachronism inherent in his critique of media and its relation to thought.

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STRUCTURAL HIERARCHY IN MUSICAL FORM: THE CASE OF MANOLIS KALOMIRIS' *FIVE PRELUDES FOR PIANO*

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(2002) "Chopin and the place of the Piano in the early 19th century musical milieu", *Polyphonia*, vol. 1.

Abstract
Musical form or morphology (*Formenlehre*) is the central concept in traditional musical analysis used to decipher and understand the structure of a musical composition. The terms *idea*, *motive*, *phrase*, *period*, *sentence* and others, constitute the basic components of musical form in combination with the functional progress of the harmonic, rhythmical and musical texture. Nowadays, the description of musical form by distinct and visually logical diagrams expanding at multiple levels and forming a structural hierarchy is a necessity for the music-theorists and performers in order to understand the musical language of the composer and explore and comprehend the composer's thought and connotations. In the examination of the musical compositions of the 20th century, where

the musical language has been released from the traditional norms of the classical period, it is very important to invent or adapt a neo-structural music analysis method.

Manolis Kalomiris (1883-1962), who is considered the founder of the Greek National School of Music, composed the *Five Preludes for piano* in 1939. In general, his musical pluralistic language combines the Western classical musical tradition with the demotic and byzantine traditions of the Greek music, using his mode-scales and harmonic functional compositional methods. In our paper, we would undertake a morphological analysis of the *Five Preludes for piano* by means of the analytic methodology of the "neo-Formenlehre" [Caplin et al. 2009, Cohn 2012 Tymoczko 2011].

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ON THE TRANSITION FROM IMAGE TO CONCEPT IMAGE IN MATHEMATICS EDUCATION: THE PARADIGM OF RATE OF CHANGE

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Abstract
Visual representations are of great importance in mathematics education as a tool for communicating mathematical concepts [Gagatsis, Agathangelou, & Papakosta 2010; Monoyiou, Spagnolo, Elia, & Gagatsis 2007]. An image can be the starting point to teach a new concept and stands as a cognitive root [Tall 1989] for the development of the *concept image*. As expressed from Tall & Vinner [1981] a concept image consists of all the cognitive structure in the individual's mind that is associated with a given concept and includes all the mental pictures and associated properties and processes.

The image is transformed in a robust and successful concept image through education. The initial image is converted, enriched and even replaced to result in an integrated understanding of a concept. This difficult process may be fulfilled by means of technology. Simulations, graphical representations, educational software and computer games constitute to a richer image of mathematical concepts.

Calculus and rate of change as a central concept [Thompson 1994] is related to changes and is difficult to be expressed by a static image. In this presentation, the concept of rate

of change is studied as a paradigm of the transition from images to the concept images of rate [Thompson 1994] through various representations [Weber & Dorko 2014] and in relation to educational software that may be used.

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SYMMETRICAL MULTIPLYING: ON TRANSFORMATIONS OF REALITY IN KALEIDOSCOPIC PHOTOGRAPHY

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Exhibitions:
(2013) *Datascape Pavillion of (Re)CHarge Information Studio*, Exhibition at Strelka Institute, in cooperation with other alumnies of (Re)CHarge information studio.

Abstract
The paper aims to analyze a special type of photography began upon the Vortograph experiments in 1917 and provides the kaleidoscope-like image. As far back as 1839 one of the pioneers of photography British William H. Fox Talbot has noticed “Make picture of kaleidoscope”, the first kaleidoscopic photograph was done only in 1917 by the American artist Alvin Langdon Coburn. He got black and white abstract compositions with dramatic interchange of light and shadow and called them Vortographs, after the name of the early 20th century artistic movement Vorticism. Since that time

photographers from different countries from time to time explored the kaleidoscopic technique in comic or serious manner. Through these experiments kaleidoscope overcame its plaything status, providing great opportunities in form and pattern construction. The morphogenesis potential of the instrument might be used not only with artistic purposes but for practical use as well — in textile and glass industries, ceramics, design and graphic design.

Looking back at almost one century long history of kaleidoscopic photography we might observe three main subjects of exploration which are 1) the human body (Weegee, Erwin Bluemenfeld, Renee Cox, Dmitry Zakharov, Julie Cockburn, Svetlana Pozharskaya – *Fig. 1*, etc.), 2) nature objects (Horst P. Horst, Nydia Lilian, Ryo Ohwada, etc.), 3) the architecture (Cory Stevens, Mattia Mognetti – *Fig. 2*, Kawahara Kazuhico, Andrey Chegin, etc.). Irrespective of the subject the method is a provocation to the reality as it multiplies it aiming to create a new reality which complies with the radial symmetry order and eradicates the Earth gravity.

In 2015 some fragments of the results of the research were reported within three international conferences in Russia and Serbia ("Lomonosov-2015", "NAMMI: Current Problems of Media Research 2015", "Revisions of Modern Aesthetics"). This paper gives more general and systematic view on the topic and is based on theoretical analysis of the historical evolution of kaleidoscopic photographic image in combination with personal interviews with contemporary artists from different countries who explore the technique in one way or another.

Fig. 1. Figure 1.
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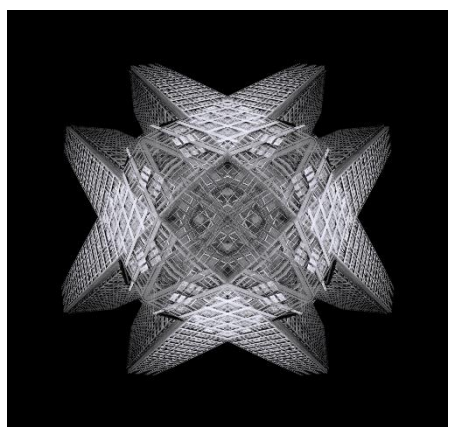

Fig. 2. Figure 2. Mattia Mognetti. Istigkeit #47, 2012.

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IMAGINATION AND INTERCULTURAL COMMUNICATION IN LEARNING A FOREIGN LANGUAGE

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Abstract
During the contemporary process of internationalization, interpersonal communication is gradually transformed into intercultural communication, because people originating from different cultural systems are compelled to communicate with each other [Heyward 2002; Belisle 2007].

The present paper focuses on an inductive methodology used to develop communicative skills in learning French language and culture. It is based on an innovative teaching approach of French language (and, possibly other languages too) as a second language and/or as a language for special purposes, taking into consideration the demands of the contemporary intercultural environment. The foreign language can be taught relying on the *déjà vu* phenomenon, i.e. the sensation that an event is considered to have been seen or experienced [Schnider 2008], as well as on the similar *déjà entendu* phenomenon, i.e. the sensation that an event is considered to have been heard [Grinnel 2008] even though the exact details are uncertain or perhaps imagined or even dreamed.

The paper undertakes an *in vitro* research of French words and phrases absorbed by the Greek language [Galisson 1995], so as

a) To motivate learners during the learning process, and

b) To highlight the impact of research on the interactive and dynamic approaches to knowledge.

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ON THE "SPEECH" OF THE ART

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Abstract
Herein we expose novel foundations for the theory of art. The novelty is grounded on the division between content and form in an art work. We have used earlier this theory to describe music (especially transcultural music, i.e. world music), but we are convinced that the theory is also appropriate for the analysis and scrutiny in the field of visual / pictorial art.

In general, contemporary art does no longer "speak" and that happens for several reasons:

a) art is a subject of globalization process, so that the non-universal elements should be eliminated from it (i.e. the content of works of art);

b) cultural competence is required by the recipients, so that the general reading ability of the work content decreases;

c) the creation of art having content requires technological competences as well as artistic ones (e.g. music composition);

d) in the art, the relativism is widely developed, that is, freedom to interpret the works that denies identity and objectivity.

Art realizes its beauty, in both the content and the form. The content of an art work is its true "speech", in which the work manifests its meaning and identity, multidimensional character and cultural context. Content and form are the grounds of aesthetic experience, but the content is the real subject of understanding. For painting, the content of art is both an unfree composition of color patches and religious symbolism, which today is often forgotten (as well as the philosophical content, etc.).

Cultural competence and ability to analyse works of art by adopting and using the categories of form and content, is a "conversation skill" in an interaction with a work of art: here, beyond the emotions and feelings, there are elements of beauty that are the subject of understanding the art work. From this point of view, in the imagination art there is a method of transfer and "record" content other than the visual one. As an example will serve us the contemporary art of light (light installations). This kind of art relates to the Jewish and Christian tradition.

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BETWEEN BODY AND MEDICAL IMAGE: VISUALIZED BIOMETRIC DATA IN THE NEW MEDIA ART PROJECTS

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Abstract
In my paper I would like to introduce contemporary art activities using biometric data in reference to the image theories. My understanding of biometric data derives directly from their medical categorization as data obtained in the processes of measurement of living beings, particularly the parameters measuring the functioning of the body. Those include projects based on medical neuroimaging, mainly digital photographs and collages. I will focus on three of them:

- Benedetta Bonichii's 'To see in the dark,
- "Ashmolean Mummy" of Angela Palmer, and
- Diane Covert's "Inside terrorism".

Bonichi's works are special X-rays images, which Bonichi titled 'To see in the dark'. Among them there are the figures of the human-animal hybrid. Looking at what is invisible to the naked eye, Bonichi tries to ask a question about our relationship with animals and evokes images of the ancient deities.

The next one "Ashmolean Mummy" of Angela Palmer is both artistic and scientific project around Egyptian mummy of two-year-old boy who died of pneumonia. The MRI procedure and the portraits which were created afterward revealed the unknown story of the two-year-old.

Covert's "Inside terrorism" is a cycle of collages, consisting of TK and MRI photographs of injures by the victims of a few terrorists attacks (mostly in Jerusalem).

The main aim of the project is to analyze conceptually the relationship between body and image, and to present the notion of the affective body. I will focus on an emphasis on the ambivalent status of the image as obtained through medical imaging techniques. The problematic ambivalence of the imagery results from the ontology of a digital image (interpretation and visualization of data) and the immateriality attributed to this data, as well as from simultaneous, strong connections between such images and corporality.

The methodology combines the theory of image and affect, the theory of representation and post-humanistic philosophy.

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IMAGINATION AND UNDERSTANDING IN MATHEMATICAL PROVING

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"[I]f mathematics is the study of purely imaginary states of things, poets must be great mathematicians"
[Charles Sanders Peirce 1956]

"Good, he did not have enough imagination to become a mathematician"
Hilbert's response upon hearing that one of his students had dropped out to study poetry
[Darling 2004, 151]

Abstract
Mathematics is about finding patterns or abstract structures behind a variety of states of affairs, and various ways of representing (codifying) these patterns or abstract structures,

by making assumptions and changing perspectives. This activity of mind is traditionally associated with the faculty of *intuition* or imagination. This is a kind of *poetic* faculty, as is highlighted by Charles Sanders Peirce (1839–1914) and David Hilbert (1862–1943). Therefore, creativity in mathematics and mathematical proving are associated with an "escape from reality" (imagination) to (semiotic) spaces or worlds, possibly governed by different *logics* (or styles of thinking) that other mathematicians might have difficulty to understand.

Traditional philosophy of mathematics that was developed during the first half of the twentieth century was largely centred on the concepts of mathematical *proof* and mathematical *fact* (corresponding to *truth*) as they were explicated within the major foundational programs (logicism, formalism, intuitionism) and their associated logical semantics. Within these currents, questions of intuition, imagination and beauty in mathematics were viewed as lying far beyond the core problematics in the foundational studies.

Joseph Goguen's (1941-2006) concept of *proof-event* [Goguen 2001] instead of proof, has proved a more adequate concept to study questions of mathematical proving, creativity, imagination, and the communicative characteristics of the mathematical proving activity. Proof-events occur at specified places and times and, therefore are unrepeatable occurrences. They are temporally extended, in contradistinction to mathematical facts or states of affairs that are considered as universals, i.e. as timelessly existing or never existing necessarily, non-locatable and non-dateable.

Proof-events presuppose the involvement of at least two types of *agents*, to which can be ascribed various *mental states*, like intuition, intention, belief, expectation, etc. [Stefaneas, Vandoulakis 2015] and performing different *roles*: an agent performing the role of *prover* experiences an insight (intention) that something is true and tries to formulate his experience in linguistic terms, i.e. in some semiotic code (symbolic language), so that he could communicate his experience (his imaginary vision) to another person. Another agent, who performs the role of *interpreter* that has not experienced the vision of the prover might not understand the prover's outcome. This is caused by the fact that naturally the prover and the interpreter have different visions of the mathematical problem under discussion, may use different communication codes (languages or generally different semiotic codes of communication, including visual means of communication), or follow different logics (styles) of thinking. In general, a prover and an interpreter may belong to different mathematical worlds, formed by their different experiences, expertise, concepts, ideas, etc. A prover explores the world (semiotic space) of (possible) *truths*, whereas an interpreter explores the world (semiotic space) of (possible) *meanings*. Thus, they perceive and interpret a proof differently. Understanding can be achieved whenever a mapping between the two *semiotic spaces*, called *semiotic morphism* or "translation" [Goguen 2003], can be established, so that the mathematical fact was proven to be independent of the language (style) used in the proof.

Such translations are common in history of mathematics, when mathematicians of every new age try to understand ("translate") the achievements of their predecessors and reformulate mathematical theorems in new terms, so that to make them readily available for their contemporaries. This is an active process of interpretation.

In our presentation, we will examine in more detail some outstanding historical cases, for instance

- Srinivasa Ramanujan's (1887–1920) proofless mathematical statements and their interpretation by the British Mathematicians, notably Godfrey Harold Hardy [Vandoulakis, Stefaneas 2013];
- Nikolai I. Lobachevsky's (1792–1856) "Imaginary" Geometry and its interpretation by his contemporaries, notably Mikhail V. Ostrogradsky (1801–1862) and Johann C. F. Gauss (1777–1855), and further by Andrei N. Kolmogorov (1903–1987) [Vandoulakis, Stefaneas 2013];
- Nicolai A. Vasiliev's (1880–1940) "Imaginary" Logic [Vasiliev 1989], its reception by his contemporaries, and further by Nikolai N. Luzin (1883–1950) [Bazhanov 1987] and the logic current of paraconsistent logic [Arruda 1980; Bazhanov 1988, 2007].

We will show that imagination concerns not only the initial insight of a prover, but pervades all mathematical proving activity, including the choice of *style* of exposition and its communicative functions [Stefaneas, Vandoulakis, 2014; Vandoulakis, Stefaneas 2014].

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BIOGEOMETRY, SOUND AND PROMENADOLOGY: THE ART PROJECT FLYWAYS

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Abstract

Flyways is composed by art works by the Belgian artist Stefaan Van Biesen and augmented reality audio scenes with SonicPlanet, integrating virtual 3D sound sources combining outdoor space, movement and sound, in a site specific sound walk by Geert Vermeire and Sinan Bokesoy. It focuses on the visual and sound imagery of traces of the dragonfly. Besides, it imbricates philosophical thinking with a bio-geometric dimension through which the nature itself creates fractal patterns. In bio-geometry, the design of motion and sound design are a spontaneous adjustment of the vibrations of the biotope,

or, in other words, a fine-tuning of the surrounded energy. Throughout this ‘mantra’ of the nature reflected in the vibration of the dragonfly’s aerodynamic – famous in the world of insects for its capacity to move in six directions – life follows the breath of the wind and becomes a flowing design of transformation.

Bio-geometry is a perspective about the natural paths of all living beings, but also about the matrix of all life, an epistemological new turn to make us understand the constant universal transformation originated by vibration. Sound and its translation in visual patterns, a fractal graphic of the life or the primordial text of the bio-symmetry is the fundamental act of reluctance against the chaos.

New technologies, as in this project, are the resultant of a bio-translation in digital and mechanical fields of the symmetry of these living patterns. Epistemologically, within Environmental Humanities, evolves a deep understanding of the living landscape, trying to find valid solution to preserve the original bio-vibration of the nature against the deep alteration that the Human configured in this new era of the Anthropos. Flyways focuses on a very poetical and philosophical part of this complex landscape of the bio-symmetry: the dragonfly. Making a relation between ethereal paths of the insect and the human paths, printing the landscape with poetical steps onto walking (promenadology) is our artistic and ecological proposal.

Recordings and compositions, as reflections at the landscapes in a reading and writing of the body and its movements, are placed in the walked space with the SonicPlanet editor and player application. First, uploading content onto a map of the area and, finally by the use of a player application permitting the listening the coming and going of 3D sounds, while moving through space.

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VISUALIZATION AND UNDERSTANDING IN MATHEMATICS EDUCATION: THE CASE OF FRACTIONS

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Abstract
Rational numbers are an important part of our students' mathematical literacy, as their understanding further contributes to understanding other mathematical notions [Avgerinos & Vlachou 2012]. For this reason, many researchers proceed in this area by investigating the students' difficulties over the rationals. Several of these studies share a common component: the idea that the way of teaching is a key factor influencing the future development of the notion of understanding in students' perceptions [Janvier, 1987; Lo, 1993; Streefland, 1991; Sfard 1991; Olive, Vomvoridi 2006]. Other researchers argue that the more frequently a student comes in contact with a representation form, the more familiar he/she becomes with it and the better he/she learns it [Hodgen et al., 2010; Jiang & Chua, 2010].

Thus, the present paper aims to present education practices with the aid of visualizations such us these help to reduce the student of the 5^{th} and 6^{th} grade of elementary school difficulties on fractions. The research emphasizes on visual way of thinking and visualization of fractions through multiple representations, use of experiential activities and activities carried out on electronic platforms [Brousseau, Brousseau, & Warfield, 2007; Hackenberg 2007; Squires, McDougall 1994; Sedig, Sumner 2006].

The results of the research indicate that students after instructive interventions with the use of the visual way of thinking and visualization of fractions through multiple representations, performed better on fractions [Avgerinos, Vlachou, & Kantas 2012; Gras 1996].

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DETERMINATION OF CRITERIA FOR THE DIGITAL IMAGE PROCESSING OF BYZANTINE FRESCO PAINTINGS

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Abstract

In this study, we present the main criteria for digital image processing, classification and possible identification of Byzantine fresco paintings based on analyses of art historians. After determining the basic criteria of the studied frescoes, we examined them through digital image analysis. The selected wall paintings were from the same Byzantine period (14^{th} century) having all the characteristics of the Palaiologian technique. A thorough comparison has been performed between the studied frescoes based on the style, line drawing and color. For the digital image processing, a very high resolution of photographic material was used in order to be as close as possible to the real fresco condition without any deformation with actual color tones so as to minimize the noise of

the photographs. Furthermore, pilot experiments were conducted by using the frequency content on imprinting important details on frescoes (e.g. the faces). The results at this stage are fairly positive proving not only the potentials of the frequency content model but also the necessity of further developing it by introducing more critical parameters in order to automatically classify and recognize fresco paintings. We strongly believe that this model will innovatory contribute both to the field of science and art.

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ARS HEURISTICA

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Abstract
Ars Heuristica studies the variables with which the world promotes and conditions the subjective production of novelties: the ways of discovery and invention. Identified as art and science, the proposal of Heuristics is to do and think consciously, worried about authenticity and not originality: a think-do that does not seek for truth but the discovery of possibility conditions. In this way, Heuristics proposes that all human work is a project and that every act can be recognized as new for its ability to modify and reorganize the existing.

> "The power is the language. Your power is language. As emperor of the earth is necessary that you be the emperor of the language, which is, the master of the earth"

insisted Fronto (the teacher) to Marco Aurelio. Fronto knew perfectly that all rhetoric – as in celebration considering visibility and concealment– is powerful because of the images: these put under siege the convention of each language.

Art, affirmed Klee,

> "does not reproduce the visible, makes visible".

I think this is an unavoidable principle declaration in this itinerary. Mostly because today, time – singularly near to the set out of Fronton – the visible does not occur: it happens The iconocracy seems to have imposed itself as a central idea: a government through images, exercise power of which we can only doubt on account of the inexistence of

another pure power, classic, autonomous. A power that disarms the subjects through the astonishment exercised over them, as Patrick Vauday maintains.

However the *imagines*, our poor images, exercise the power through a deep cut with our own past. And, isolated from our past we have less possibilities of situating in the historical stream. This is the reason –the only reason, as Walter Benjamin affirms– that images from the past have transformed into a political matter. Well, the images are placed; they do not become visible beings, things, places or relationships without hiding others.

Heuristics, then, requires to locate in a meta-disciplinary level with the decisive and also poetical gesture from who clears the path before the sowing: to accept that the amplitude and the diversity of knowledge's and experiences constitute the privileged basis towards all the construction of subjectivity also means to accept the complexity of the ideational phenomenon. Thus, in this paper the very form of text will be a statement of principles: develop an exact economy through paragraphs – legible in autonomous way or integrated in small series – to favour the essential emptiness so that every trajectory of reading could make possible the construction of meaning.

I will try, thus, to practise a conscious search of this fundamental articulation between *Eidos* and *Morphé*, but also considerate the change on the nature of the problem of ideation – that involves ways of representation, reproduction, projection or relation of the expression devices – through a question: not for the intelligible nor purely sensitive, but because of the relationship that unites both: a *dispositio imaginativa*.

Resuming a path that has been gone over by Archimedes, Lullus, Lichtenberg or Bateson, to cite some names, can contribute to enable a new sensitiveness strongly contextual to make possible the evolutionary continuity: celebrate – as affirmed by Rupert de Ventós –

> "the event should not look for perfect forms but relevant and articulated ones".

He, who does not try to explain the world, but to engage in it, who does not try to inform so much about it but shapes it, who does not try to resolve and reform it, but represent and recreate it.

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