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### A BRIEF ESSAY ON SEMANTİCAL ANALYSIS OF SPACE TIME AND SPEED IN DRAWING AND PAINTING
*(Paper)*

*Topic: The Semantical Analysis of some Drawing and Painting that are Chosen for Architecture, Interior Architecture, Industrial Design Education*

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*Abstract*

One of the most important applications of the designing process is the visualization of every phase of the design. This allows the designer to be more precisely manage the differences between mental and visual work from the beginning of the design process to the end of the designing process. Besides the classical methods such as drawing, and printing, photography, animation, digital design, digital drawing/visualisation programs to android drawing applications, one of the common features of advanced technologies is the visualisation quality of the idea. The criteria that construct this quality includes the technological possibilities as well as the designer's ability to express the idea of generativity. This ability of the designer is more related to the ability "vision" and "visualisation.

This paper contains drawing and painting analysis which is one of the subjects that are taught within the scope of Visual Perception course of Anadolu University, Faculty of Architecture and Design. In this regard, a semantic analysis is conducted on how the concepts of space, time, and speed are expressed as line and colour values. The works of art chosen for these analyses were selected from Cubism, Futurism, Dadaism and Surreal movements, and artworks have been tried to be analysed comparatively.

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# A Brief Essay on Semantical Analysis of Space Time and Speed in Drawing and Painting

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## Abstract

One of the most important applications of the designing process is the visualization of every phase of the design. This allows the designer to be more precisely manage the differences between mental and visual work from the beginning of the design process to the end of the designing process. Besides the classical methods such as drawing, and printing, photography, animation, digital design, digital drawing/visualisation programs to android drawing applications, one of the common features of advanced technologies is the visualisation quality of the idea. The criteria that construct this quality includes the technological possibilities as well as the designer's ability to express the idea of generativity. This ability of the designer is more related to the ability "vision" and "visualisation.

This paper contains drawing and painting analysis which is one of the subjects that are taught within the scope of Visual Perception course of Anadolu University, Faculty of Architecture and Design. In this regard, a semantic analysis is conducted on how the concepts of space, time, and speed are expressed as line and colour values. The works of art chosen for these analyses were selected from Cubism, Futurism, Dadaism and Surreal movements, and artworks have been tried to be analysed comparatively.

## 1. Sight, Interpretation, Visualization[1]

Today's world, in which we exist, and which we can maintain the continuity of our species, has evolved through the struggles of our ancestors for thousands of years. In general, this struggle was given against the earth we live on and the nature of the living things outside us. So much so that we continue to evolve in this world, where human beings with the needs and desires are shaped. The most important element that enables this process is the people who can see the world as they live in and convert them into an idea-design. Hence, it is an important competency to be able to see.

Vision is an action that can be performed physically with the sight organ. The image obtained by this action is interpreted in our minds. The meaning is realised through the five senses, the data we have acquired about the world outside our body (the family we are born in, the social environment in which we are, all our experiences, the education we have received, the information we receive from our culture, and the source we have obtained), in our minds according to our body-mind capacity. Therefore, the act of interpretation is individual. In this case, abstracting can be explained as visualisation of the concretisation of abstract thought using various techniques (language, writing, music, architecture, design, knowledge production, scientific research, etc.). In

these circumstances, it will not be wrong to call the result obtained by visualisation in a very general sense, abstract or concrete image.

The concretisation of the ideas we developed to meet the material and spiritual needs and demands of the people was carried out one by one until the second half of the 18th century (especially the last quarter). For those periods, we will call designers and producers, they were either called artists or craftsmen. The products were valuable in terms of their uniqueness, durability in time and accessibility to the people of certain classes. The most important factor in the formation of this difference was the different approaches of the artist or craftsman/master's way of seeing and understanding the problem and providing the solution. For instance, one of the reasons why the architect who designed the dome of Florence Cathedral was F.Brunelleschi or the painting of the Cosimo de Medici[2] in S.Botticelli was shown to have different approaches to design within the periods of Brunellischi and Botticelli. Due to these differences, Brunelleschi and Botticelli's works have taken their place in the history of European art and architecture as a result of their meaning and thus their value had increased.

Until 1781, science and the technical developments that we have experienced created the infrastructure necessary for the invention of the steam engine of James Watt, the Scottish engineer. With the use of steam engines, the concept of production and consumption began to change rapidly. In general, mechanisation, the development of production processes, the accumulation of capital has led to the beginning of the period we call the Industrial Revolution. In the nineteenth century, it continued its development by evolving with the introduction of electric energy and machinery using petroleum and natural gas. The production of the unique products by artist or craftsman/master has been replaced by the mass production, which had brought the necessity to design the product. Due to this development, a new professional group called "designer" has started to be formed. If we take the example given above from the art of painting, in the nineteenth century, as well as the development of moving images/cinema in addition to the use of cameras, technical images were obtained and allowed to be reproduced as desired. In this way, the portrait painting that was originally ordered to Botticelli was replaced with photography that could be reproduced as desired.

At the end of the eighteenth century, the economic changes that become major and the social changes followed it with in all aspects continued in the late 19th–early 20th century. These developments in mathematics and science accelerated the development of existing ones as they paved the way for new technologies. Thanks to these developments, people have been able to use the new technologies at every stage of their lives[3].

The developments we have expressed with very general outlines above, along with many innovations towards the middle of the 20th century continued with the development of information about the universe, electronic technologies, and computers. While the 20th century was called with the adjectives such as the age of space, communication age, speed and the age of information technologies, the revolutionary digital developments that entered human life after the second half of the century led to the definition of the 21st century as the first digital age. In addition to the production of information and technology, virtual reality began to take an active place in people's social life practices. The virtual space-time has begun to take place in the space-time, which was previously defined as "real".

It is not only the definition of reality that changes. Within this paper, it is necessary to redefine the basic concepts of the field of design such as artwork, design, production, reproduction, vision/concretisation, image, new discourse, and myth. One solution to this necessity came from German literary critic and thinker W.Benjamin in the first half of the 20th century. In his 1935 paper "The Work of Art in the Age of Mechanical Reproduction"[4], Benjamin while introducing a new

definition to the basic concepts of art, artist, artwork, reproduction and design, on the other hand explaining the changing design patterns and design/art markets[1]. This process naturally affected the artist/designer's decisions in the process of creation, as well as the meaning of the form language/image of the physical or non-physical function of the resulting work.

In his book "Art and The Committed Eye-The Cultural Functions of Imagery"(1996), R.Leppert gives a strong support to our understanding of the changes I have mentioned above, with his remarkable refined analysis of the social and cultural uses of images in European art history-especially art of painting-which he dealt with on the basis of European culture[2]. One of the best examples of these changes from the 20th century can be found in R.Barthes's book called "*Mythologies*(1957)", in which he gives semantical explanations. In particular, the essay was written of Citroën DS model car, called "The New Citroën". In this essay, Barthes makes a semantical analysis of Citroën's new model of DS's design, by giving a striking example of the new discourse of the age. In the same issue, Barthes's book called *Empire of Signs*(1970) makes noteworthy semantic analyses of Japanese culture, unlike European culture[3].

## 2. Designer, Creativity, Generativity

It is thought that some recent developments and evolution processes of the recent history, which are outlined in a limited number of selected studies above, constitute a general framework for examining today's world in terms of art/design.

As stated in note 3, the world's population registered in 1900 was 1.650million while the world population reached 7.324million in 2015 according to the same source. There is now a global, regional and global market. Hence, the needs, questions, demands have multiplied by the number of people who design, produce and consume.

According to the "Digital in 2018" survey made by the companies We Are Social and Hootsuite, the number of internet users in the world is over four billion[4]. It says that at least four billion people are at their fingertips all over the world. When people use spaces and objects in the time of the real world, it is clearly seen in the social life that the digital world begins to use spaces and objects in the concept of time. One of the best examples of this is the story of filmmaker Cronenberg in the film "eXistenZ(1999)". The story tells a group of people who begin to experience the time of the digital world from the real world through the console game that creates a kind of simulation.[5] One of the main themes that Cronenberg questioned is the fact that new biological designs can be made. It is also important to note that science continues to seek answers to questions in real and digital space. Artificial solutions developed in all areas where people need to evolve (in response the problems created by artificial solutions), instead of artificial, the production of similar to the biological one, the speed of the work like robotics, artificial intelligence continues to increase. In 2006, Prof.M.Sarıkaya and Prof.C.Tamerler collaborated in a study with a method called artificial evolution, they discovered producing gold in the laboratory, which the alchemists had been chasing for about 2500 years[5]. In 2014, Prof.B.Koç and his team were able to print the aortic vein tissue[6] with the 3D printer for the first time in the world, or the oil painting portrait work made by an artificial intelligence found a buyer of $432.000 at an auction organized by New York Charities[7].

In today's world, which we have discussed above, the designer must be able to exist in real-digital space-time. One of the important providers of this is that it can create a unique design language by developing a different approach to design with a good understanding of the world of the day and the interpretations it will bring. This process also leads to the emergence of productivity in creativity. The best examples that will be easy to follow are the plastic arts.

# 3. *The Different Images of Space, Time and Speed*

Since there are key phrases, I would like to start in this section with two quotations:

"…But it may be said that geometry is to the plastic arts what grammar is to the art of writing.", G.Apollinaire[8] and " Our remarks until now about visual perception have concerned its content alone, the two dimensional 'seen' and the three dimensional 'known' visual images." from D.H.Kahnweiler[9].

Among the works of C.Monet there are a series of paintings in which a façade of a building is depicted. The cathedral that Monet made more than thirty paintings of west façade between 1892-93 is the Rouen Cathedral which is a beautiful example of the French gothic movement; the cathedral is located in Rouen, the capital of the Normandy region of France. The artist painted more than thirty paintings of the cathedral's west façade by looking at the same point for a year. Each painting in the Rouen series is a different view of Rouen Cathedral. As an impressionist painter, Monet portrays the cathedral which he sees under the light created by the changing seasons, as he saw himself. The differences in the artist's view have allowed him to depict the space-time and the velocity in which the cathedral is located, within the boundaries of each painting. One flows slowly with the lust of heat, the other runs at the speed of the cold. One is standing as close as you can when you extend your hand and the other is a few meters lower. (Kandinsky's "Concerning of Spiritual in Art" published in 1911, is notable for its concepts of colour, sound and space[10]). In the series of Monet, every piece of painting depicts a different appearance of the Rouen Cathedral. Monet used his brush and colour palette as a way of embodying what he saw in the way he wanted. Differences in concretisation are included in the approach of a painter to the art of painting. Therefore, the charge of the painter will radically change everything.

## 3.1 P.Picasso(1881-1973), Cubist

R.Leppert identifies the image created in the field of art as the main tool for manoeuvring time and space, while at the same time pointing out that the image is a diagnosis, prediction and confirmation mechanism[11]. Picasso and his works are a good example of this recognition.

The main tool for Picasso's transition from description to abstraction in his paintings is the geometry and mostly the classical perspective approach that comes with it. As I mentioned before, we see more clearly when we comprehend more than what we actually see. When we look at a branch and its leaves seen behind a building in a photo frame, we see the whole building and the branch and tree (if our minds can complete the image of tree and branches from) seen from behind as a whole. Therefore, it would not be wrong to say that our physical view may be of a higher dimension than 3D. Hence, 2D objects can be fully visualised on a 2D plane (canvas), while 3D and above objects are visualised in 2D creates the necessity of changing geometry and perspective. This process can be easily followed in the classical art of painting developed by P.Cézanne by adhering to the definitions of perspective, form, light and dimension. For example, while in "Man Smoking a Pipe" painting, one can see the top of the man's shoulders and a small section of his back, in the painting "Mont Sainte-Victoire 1902-04", he partially stretched the topography and reduced the slopes of natural details. In the article "Note of Painting" J.Metzinger refers to this situation as "Cézanne showed us forms living in the reality of light, Picasso brings us a material account of their real life in the mind"[12].

The document of G.Barque published in 1917 is a kind of specification of Cubism[13]. The ground rules mentioned here can be followed in the style of Picasso. The forms of the live and lifeless objects are deconstructed and recomposed in an unusual way in line with Picasso's point of view.

The colour stains composed of polygons are located on the canvas by combining rough-and-tumble with thick dashes. The deepness is not read itself easily just like the perspective and light. Although J.Riviére insert those among the mistakes of Cubism, the aforementioned situation goes beyond the general acceptances and requires to be treated with a new point of view[14]. Picasso changed the geometry. Now the geometry in question is the Non-Euclidean[6] geometry, not the Euclidean one. The shift in the geometry changes the space-time and accordingly the speed of the image.

While the rapidly advancing developments in the field of mathematics in 19th and 20th century revealed new geometries, B.Riemann's Riemann Geometry, E.Noether's Symmetry Theory in which she correlated symmetry and conservation law, or the developments improved by Minkowski, H.A.Lorentz and M.Planck, and especially H.Poincaré's Poincaré Conjecture[7] cosmology played a vital role in the development of quantum physics. Since then the fourth dimension theory ensured that many theories in the fabric of space-time and in similar topics could be developed. The most important output of that period was A. Einstein's[8] works on the photoelectric effect, the Brownian motion, the special relativity and matter-energy equivalence. Those works in particular, the progresses were revolutionary for the science world. The subjects like the higher dimensions, the fourth dimension, the curved space-time contrary to Newton's model, subatomic particles are the subjects drawn considerable interests of the people in their importance. Thus, for a sensitive artist it is unlikely to be isolated from those developments. In an interview done with the painter, he says the art is concerned with the form initially and the form arose lives its own life. According to him, while the geometry meets the temporary needs, he doesn't concern with the speed and the subjects like trigonometry, mathematics, physics, and therefore the people correlating the art with those don't understand the cubism[15].



*From left to right: Portrait of Ambroise Vollard, Naked Woman Sitting, Woman with a Fan*[22].

When it is considered the vision is something upon 3D (In the design training, 3D is usually interpreted upon the Plato solids. However, those bodies could be broadly defined as Euclidean geometry elements. But the geometry of the dimension we would define as 3D includes the non-Euclidean geometries as well. So, the expression of upon is used.) it wouldn't be wrong to say the image on the canvas –arose in artist's works because of painting what she/he sees– would remain in a place between 2D and 3D (the structure arose as a result of any material added to a plane as the thickness of the paint or the collage style would come up the 2D in all cases). If it's considered the space called 4D involves the 3D, in this case we can say it entirely involves/enfolds the world which a person perceived out of her/his body. If so, when looking at higher dimension objects (if we can perceive), we make out that we can be entirely in the image. In general for Cubism and in particular

for the art of Picasso it's said that, the artist reduced the 3D he saw to 2D by extraordinarily visualizing some angles of the objects which the eye cannot see. Whereas, because of the reasons we mentioned briefly above, the images produced by Picasso could be also interpreted as the projections of the higher dimension and the related space-time speed in 2D. Herein, Arthur Miller's work entitled *Einstein, Picasso: Space, Time and the Beauty That Causes Havoc* in which he comparatively analyzed and interpreted Einstein and Picasso is a remarkable study[16].

An important outcome of digital image technologies is to acquire the images of scientific developments and imagined designs. By this means, visualizing the stages of an idea recorded during the realization period facilitates to process the mentioned idea in every aspect. The visual reality technology, both an interactive game and the 3D movie screenings shows to the player/moviegoer how the space-time they perceived surrounds them with a different concretization method. In the movie called Interstellar (Director: C. Nolan, 2014), when the hero came behind the bookshelf, the geometry used for visualizing the space-time-speed perception changed behind the bookshelf in respect to the in front of it and its encompassment the hero is the non-Euclidean geometry. Especially the fractal geometry elements were intensely used. Similarly, in the fantastic science fiction movie called Dr. Strange (Director: Scott Derrickson, 2016) in which the space-time-speed fiction rapidly changes at the scenes, while the space-time-speed was changed by using different geometries, the reality of metamorphosis is raised at some scenes. The visualization of rapid shifts between fractal, elliptic, hyperbolic, topologic, Euclidean geometries is quite successful in this movie.
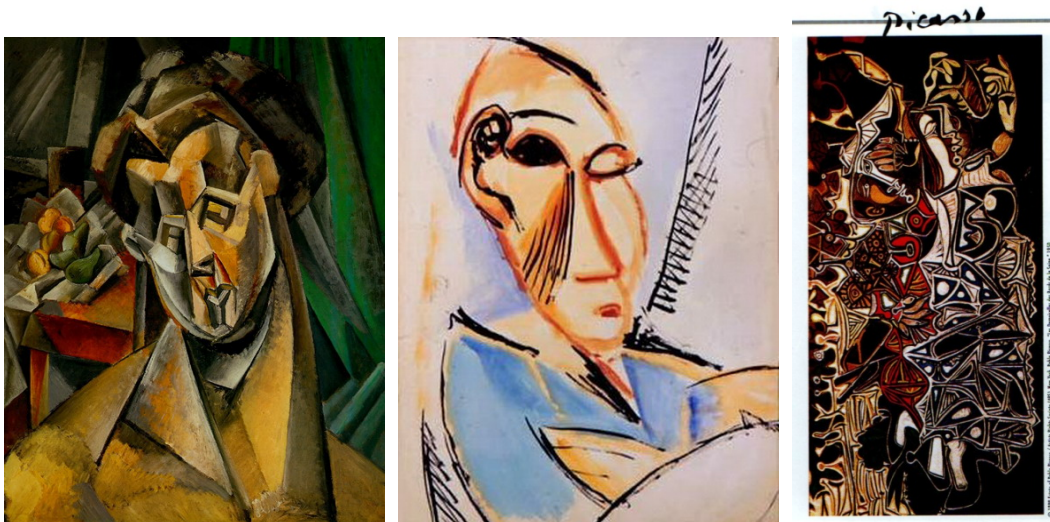


*From left to right: Woman with Pears, Head of Medical Student, Les Demoiselles au Borrd de la Seine*[23].

In brief, the projection of the perception of higher dimensions (thus of the space-time-speed) on the 2D are the images expanding limitlessly to the four directions on the well-defined plane like a canvas, always being in the direction which the viewer looks, returning all the looks to right and left, up and down, in and out with a look in a portrait viewed. Besides, the alignment of the objects in the extraordinary ways and locations, namely, their setup changes the mood of the viewer at a pace. The swing of the rhythm built on the balance (symmetry) of the paint is effective. The speed is slightly felt in that order which could be clearly followed in the works of Picasso (although the discrepancy of the material, pen, paper, etc. which the painter used in his drawings changes the perception of the image, in principle the space-time-speed is perceived similarly). His paintings are like the image of a moment in a different space-time, or...

### 3.2 U.Boccioni(1882-1916), Futurist

While the speed takes part in the back rows in Cubism, it's almost the main generator in Futurism.

Savaşı That anarchist spirited movement blessing the war accepts the speed as a new value of beauty as mentioned in its manifest written by F.T.Marinetti[17]. The dynamism rapidly coming and the crystallized view are the important elements of the paintings[18]. The movement in his paintings are the important elements enabling the speed. So, the elaboration, the profundity and the perspective of the action enabling the movement is an important technical detail enabling the perception of the speed. The photo dynamism is a technique allowing that to the futurists. By transposing the images of the movement details acquired by that technique to other materials, the futurists materialized the speed with the main elements of the composition. The forms which compose the details reveal the movement by stratifying. The use of polygons, especially acute angled triangles are projected according to the direction and/or the focus of the speed. The geometric structures of the crystals and the scattering of light are the important parts of the composition complementarily.



*From left to right: Horizontal Woman, Simultaneous Visions*[24].

In a race car travels accelerating, the image outside the car rapidly changes. The figures composing the objects linearize by becoming kind of triangles through the reverse direction of the speed. That completely changes the geometry of the image of outer world in an airplane moving with a speed of 3.000 km/h. As if the airplane travels in a different space-time surrounding it. The vectors, the values of direction and length and a good geometry enable the visualization of that kind of space-time-speed on a canvas. In Boccioni's paintings, while the elements were located according to the order he wished to show, the first prominent thing is the Euclidean vector perception. In some paintings, the geometry of those stains elongated afterwards and  transformed to the stains slightly elliptic and/or bearing the lines of the hyperbolic geometry (As the vector space is the subset of the topological space, it is possible to follow the traces of the topological geometry). That turn enables the looks of the viewing person are encompassed by the speed. Therefore, in the paintings of Boccioni in which substantially Euclidean and some non-Euclidean geometries were used, the speed was an image which didn't change the physical structure of the object and as if perceived the formation of a high-speed car with the place it enabled (The sculpture entitled "*Unique Forms of Continuity in Space*" made by the artist in 1913 should be discussed in this context). A similar speed perception is seen in the painting entitled "*Nude Descending a Staircase No:2*" by M.Duchamp in which he illustrated the details and the speed of a movement with its beginning and end. The space-time composed by the speed with the movement here is different from the perceived in the paintings of Picasso.
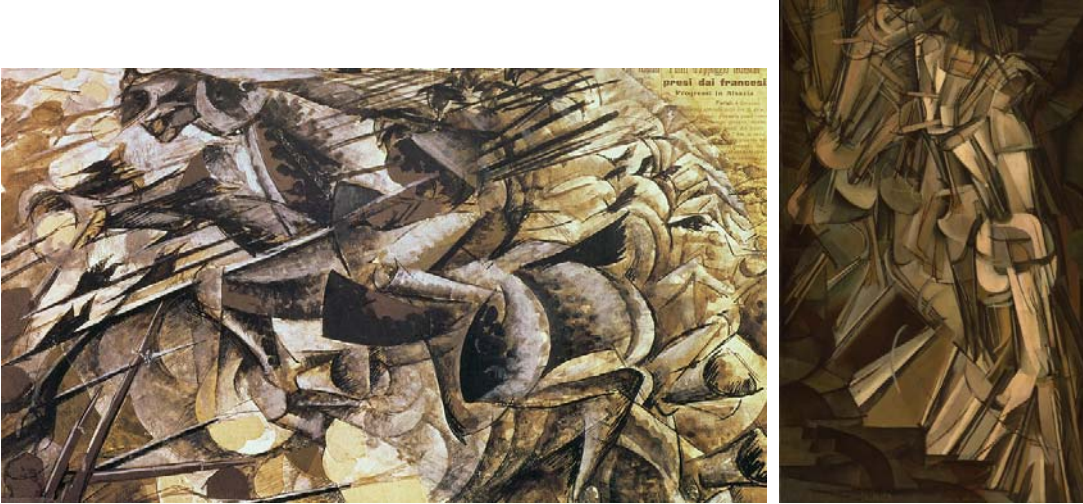
*From left to right: The Charge of the Lancers, Nu Descendant L'escalier No.2- Duchamp*[25].

### 3.3 S.Dali(1907-1989), Surrealist

…Or it is very fast.

It is seen that the psychoanalysis theory of Freud and the dialect of Hegel took an important part in the surrealism definition revealed by A.Breton in two manifests and an article written in 1924, 1925 and 1929 [19]. There, in general he expresses the dreams and hallucinations of the person are the superior reality according to the reality of the world outside her/him. The image of the objects in the real world completely differs in the superior reality. It is out of the ordinary. That definition of image is clarified with the definition of formless by G.Bataille[20]. And Dali adds to the definition of the surrealist image that it's the mental process of the paranoia. According to him while that image discredits the real world, it is far away the limitless, non-hierarchical and classical representation mechanisms[21].

The space-time-speed taking part in the centre of dream, hallucination and paranoia concepts which create themselves in a mental process in general, differs from what it is perceived in the outer world. For example, although the dreams seen in the rapid eye movement sleep last for one minute at most, the dreams remembered may contain the events last for hours or days. Herein, based on the relativity theory of Einstein, it could be said that the time passes slow because of the dream speed. So, the geometry used in visualization of the projections of the forms on a plane existing in the real world and included in the scenarios built in the mind, in the speed of thinking would change. To express the image of the space which becomes fluid with slowing down of the time with the lines of the non-Euclidean and especially the topological geometry, simplifies the transfer of the main point to the viewer. Therefore, the speed in the paintings of Dali entitled "*Melting Watch"* and "*Spider of the Evening"* are so high, the time slows down and the space flows correspondingly. The familiar forms transform to a flexible structure. The image of the clock, the cello and the cellist elongates like a rubber. And the speed dissolved Gala to her molecules in "*Galatea of the Spheres".* Likewise the speed visualised in the fight scene of Agent Smith with Neo, the hero of Matrix movies (Directors:Larry and Andy Wachowski, The Matrix, The Matrix Reloaded, The Matrix Revolutions) which have a scenario passing in the virtual reality. That speed is equivalent to the digital signal speed. As if Neo and Agent Smith are dancing with slow movements under the pouring rain. While watching the raindrops flow down, we see that Neo opens a large crater during his rise slowly and coast down.

*From left to right: Melting Watch, Spider of the Evening,Galatea of the Spheres*[26].

If we return to the first sentence of this part as the last sentence of this part, the space-time which Picasso illustrated in his works like "*Les Demoiselles des Bords de la Seine"* resembles the one Dali illustrated. Both artists illustrated the world they perceived/built in their minds with the speed-space-time of those worlds by using the elements of non-Euclidean, especially topological geometry.

## *4. Conclusion*

Through the three names selected from the plastic arts, the different forms of approaches to design and the images expressing different space-time-speed revealed by the use of different geometries in concretisation of those are aforementioned. While those differences created a tremendous impression in their period, they caused important changes in the flow of art. However, with its premises, contemporaries and consecutives, there are more in three different points of view, in the creativeness and in the space-time-speed showed by the produced worlds. M.C.Escher's Poincaré disk model composed of fishes, topological picture gallery; or the stratified fluid networks take part in the digital space-time on the pictures of J.Pollock, can be mentioned. We can talk about three layers in the painting of Istanbul, which is seen by D.Erbil. In general, the first layer of His Istanbul paintings refers to miniature art on the Euclidean plane. The second layer is a layer in which multiple perspectives can easily be traced referring to fractal geometry (as a decimal size between 2D and 3D). Finally, with the 3D layer as the third layer, the artist combines 3 different space-time-speed sensations on the same painting. A similar example of this layered structure by Erbil is seen in a series of photographs by M.Germen. Or A.Ebüzziya Siesbye's ceramic pots that are resist Newton's principle of gravity. So these bowls are the dynamic bowls that are rising and expanding while the mud bodies rotate rapidly, on a small base.
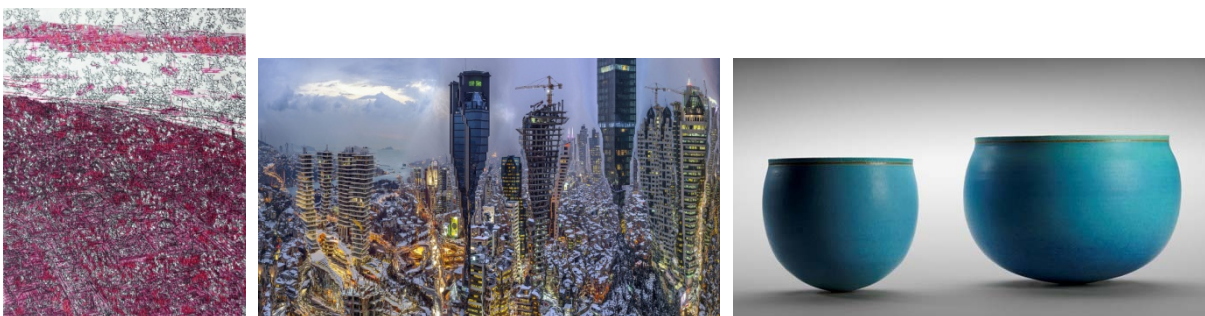


*From left to right: Istanbul 2005 D.Erbil, Morphosis Istanbul-Zincirlikuyu2013 M.Germen, Untitled 2003 A.Ebüzziya Siesbye* [27].

In brief, developing science and digital technologies play an important role in better understanding the world we live in and the universe in which we live. This process changes humans perceptions, thoughts, ways of exist and needs. Therefore, in today's evolving world, the designer/artist has to

become aware of science and technological developments. In this way, the designer/ artist can interpret the data acquired by his senses with his cognitive sensitivity and put forward a different perspective. This is an important factor for a designer / artist to be creative and generative.

## *5. Notes*

1.The concepts of vision, interpretation, and visualization are broad concepts. These are very generally defined to be appropriate to the paper content.

2.''Portrait of a Man with the Medal of Cosimo de Medici the Elder''-S.Botticelli,(1474-1475).Wikipedia.

3. The individual and social changes that emerged as a result of scientific and technical developments took place at a dizzying speed. In 1900, the population of the world was approximately 1.650 million while the European population was 408 million (according to the data in the Wikipedia article). Developments in the field of health (such as, X-ray, presence of blood groups, blood transfusion, penicillin, etc.) while prolonging the life expectancy, reducing the new-born deaths. Public transportation increased the mobility of people while increasing life speed and shortening the distances. Easy access to food. The telegram, the phone's discovery. Women's rights. The use of steel instead of tensile iron. Widespread education. Cinema, radio, video recorders. Sending the first photo by electric telegraph. The first intercontinental phone call. Atlantic extreme sea voyages. Warplanes, battleships, submarines. The first works of modern literature by Joyce, Woolf, Beckett, Proust, Kafka. Bugatti's racing and navigation car manufacturing factories. I. Ducan and modern dance. Garment production. Fashion. Coco Chanel. The start of astrophotography. The first colourful feature movie. And so on. There are many people who have contributed to various different disciplines to make our world the way it is today.

4. The aforementioned article is included in Walter Benjamin's *Das Passagenwert*, which he started in 1927 but could not complete due to his death. (Istanbul: YKY, Author Biographies, Walter Benjamin item.)

5. Although there are many works to be considered as early as the works of Cronenberg in the art of cinema, the movie called *The Purple Rose of Cairo* (1985) by the American filmmaker Woody Allen (1935- ) should be remembered here. In this movie, Allen has taken the film's main characters from the curtain to the real world.

6.Euclidean Geometry. Non-Euclidean; Hyperbolic Geometry,Elliptic Geometry, Topological Geometry, Fractal Geometry and so on.

7.The books *"La Science et l'Hypothèse"*-1902 (http://henripoincarepapers.univ-lorraine.fr/chp/hp-pdf/hp1917sh.pdf, 10.11.2018) and "La Valeur de la science"- 1908

(http://henripoincarepapers.univ-lorraine.fr/chp/hp-pdf/hp1919vs.pdf, 10.11.2018) written by H. Poincaré are the first sources to look at.

8."Über Einen die Erzeugung und Verwandlung des Lichtes betreffenden heuristischen Gesichtspunkt" (1905), "Über die von der molekularkinetichen Theorie der Wärme geoforderte Bewegung von ruhenden Flüssigkeiten suspendierten Teilchen" (1905), "Zur Elektrodynamik bewegter Körper" (1905), "Ist die Trägheit eines Körpers von seinem Energieinhalt abhängig?" (1905), "Über die vom Relativitätsprinzip geforderte Trägheit der Energie." (1907), "Über das Relativitätsprinzip und die aus demselben gezogenen Folgerungen." (1907), "Prinzipielles zur allgemeinen Relativitätstheorie." (1912), "Grundlagen der allgemeinen Relativitätstheorie." (1916), These articles of Einstein are prioritized sources.

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