Exploring the potential of applying genius loci as a concept in landscape architecture

Atefeh Farshadi

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Estonian university of life sciences

Supervisor: Simon Bell

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1.1 Introduction

Genius loci is an extremely complex and multidimensional concept, which involves the physical, psychological and social aspects of environment and is multi-layered (Smith et al., 1997, 233). Theoretical bases of this research came from ideas of phenomenologist architect Christian Norberg–Schulz, concerning place phenomenon and genius loci. In order to have more comprehensive framework, the Relph theory (Relph, 1976) has been used which is about feeling of outsideness and insideness in the space and people experience in the place. Additional to the mentioned theory, Alexander (Alexander, 2002) and Salingaros (Salingaros & Mehaffy, 2006) theories are studied as well for finding the meaning of places. Sense of place and genius loci can be defined as “the collection of meanings, beliefs, symbols, values, and feelings that individuals and groups associate with a particular locality” (Williams & Stewart, 1998).

This study is photo based preference judgment, that the participants for doing this judgment are all landscape architecture. For including all kinds of places and having comprehensive study, photographs has been used. The use of photographs to represent environmental conditions is a common way in evaluating of public preferences (Brown et al., 1989). The advantages of using photographs can be as follows:

First, photos can explain situations better than mere verbal descriptions. Second, photos can reduce the cost and save the time. Third, photos can be change and can give controlled comparison among alternative conditions (Brown et al., 1989).

"Scenic quality assessment methods can be divided into three general categories: (1) descriptive inventories, (2) surveys and questionnaires, and (3) evaluations of perceptual preference." This study is more close to the second type of assessment (survey and questionnaires), respondents’ expressed preferences are related to landscape beauty. (Daniel & Boster, 1976, P.5) Beauty is partly defined by characteristics of the environment, and in the other hand to high extend, it depends on human judgment and it goes back to our knowledge and background.
1.2 Phenomenology of place and genius loci

There are so many phenomenological researches about place that has done by architects, geographers, urban planners, and physicists, that has detailed look and often quantifiable principles for comparing places (Lewicka 2011, P.223).

The aim of phenomenological researches is to describing distinctive definition of the phenomenon. In the other word it also can be a starting point for finding essential and the most important core of the phenomenon. Phenomenologist try to find general qualities, meaning and characters for specific phenomenon that exactly describe the nature of it in the concrete lives and experiences of human beings (Seamon 2000, P.159).

The phenomenological method was employed for studying places by several pioneers of place studies, such as Tuan, Relph, Buttimer, Seamon, and Norberg-Schultz, resulting in the concept of place as bounded, unique, with a clear identity of its own, having a genius loci, being historically rooted, and providing rest rather than movement (Lewicka 2011, P.224).

Genius loci is a Roman concept, every independent have its genius and guardian spirit. This spirit gives life to people and places, accompanies them from birth to death, and determines their character or essence (Norberg-Schulz 1980, p.18).

The concept, on the one hand, is rooted in the subjective experiences such as memories, traditions, history, culture, and society. It can be affected by the objective and external effects in the environment such as design, landscape, smell, and sound, on the other hand. Accordingly, sense of place is a complicated concept of the human feelings and attachment towards the environment that is produced due to the adaptation and use of place by the human. It means that sense of place has not been a predetermined event but results from the human interaction with the environment (Falahat 2006).

Norberg-Schulz in his book, Genius Loci Towards a Phenomenology of Architecture, establishes phenomenologically a four-fold typology of natural places grounded in such qualities as spatial character, light, and daily and seasonal rhythms (Seamon 1982).

First, Norberg-Schulz describes the romantic landscape, an environment of change, variety, and detail best illustrated by the forests of Scandinavia and Nordic landscape; second, the cosmic landscape, an environment of monotony and massive expanse, best exemplified by the desert; third, the classical landscape, an environment balancing variety and continuity, best illustrated by the Greek landscape; and, fourth, the complex landscape, a blend of the first three and ultimately best representing most actual places, which generally are never pure but mixed in their natural expression. In short, Norberg-Schulz’s aim is to identify how atmosphere, water, land, and life meet in location to generate a particular style of physical environment, natural place and region (Seamon 1982).

The factors which create sense of place, are divided into two categories: cognitive and perceptual factors; physical characteristic (Steele 1981).

Lynch (1960), defined qualities of the cognitive space and imagibility of the space which helps
us to identify places. singularity, simplicity, continuity, dominance, clarity of joint (emphasis on strategic intersections), directional differentiation (asymmetry), visual scope (view points) and motion awareness (to be aware of the speed of moving), time series (series experiences over time), names and meaning, are the concepts of space cognition. These qualities may be applied to each element when designing qualitative urban environment which is functional and easy to orientate in. (Lynch 1960)

Environmental quality which protect mans against getting lost, is called by lynch imaginability which means that shape, colour or arrangement which facilitates the making of vividly identification, powerfully structured, highly useful mental images of the environment. Our cognition of one Place is depends on these physical and perceptual elements. (Lynch 1960)

One of the most important authors in this regard is Relph (1976), who explores the nature of space and place phenomenologically and extend outsideness and insideness by viewing them as ends of a continuum along which can be identified various modes of place experience. (Seamon 1982)

Relph in his book, place and placelessness, explore space in terms of how people experience it, and he categories seven modes of spatial experiences:

1. Pragmatic space: it is an organic and primitive space rooted in a fundamental objective. It is structure is unconsciously and starts with simply and basic experiences of early childhood.

2. Perceptual space: it has content and meaning inside and is self centred. Depends on experiences and contacts between human and environment perceptions are different.

3. Existential space: it is an inner structural space in our experiences, we understand it as a culture. It’s inter subjective and acceptable for all group members. It is not passive and constantly being created by human activities (defined by culture).

   a) Sacred space: It is obvious in an ancient cultures and religious. It is constantly changing, and there is deeply personal participation in buildings protection. Orientation is towards the sacred place.

   b) Geographical space: It reflects basic awareness, experiences and willingness of the world. Man choose name for them to make ownership on the spaces. It has color, depth, volume, symbols, and mental relationship.

   -The structure of geographical space: The most famous theories in urban spaces come from Gordon Cullen (1971) and Lynch (1960). Cullen described experiences and personal views of the city. And he conceived the concept of "serial vision" He said
urban experience is one of a series of revelation. With interest that stimulated by contrasts. He added environment has to be designed from a moving person’s point of view. Schulz (1971): Introduce vertical and horizontal structure of concrete space, and he had seen them in different environmental levels.

4. Architectural and planning space that conscious try to create space

5. Cognitive space: Making space as abstract for thinking and try for developing theories about it. Cognitive space is homogeneous, uniform, neutral With equal values in all parts and directions of space. Generally plans and large scale photos can express them and man can think about the space in this category.

   Today in the modern life, our knowledge about plans and photos can have effect on our cognition’s about the spaces and it can change our feeling about specific space.

6. Abstract spaces: There is no experimental differences and logical relationships are exist in this spaces. Spaces are recognized by isotropic, continuous, homogeneous, finite or infinite, and all personal experiences will be eliminated.

7. Relations between forms and spaces: Forms make wide definitions and meanings for space. Familiar forms in the different spaces give same meanings. (Relph 1976)

   All of these kinds of experiences have different effect on people, their cognition about spaces and their feeling of belonging. Relph phenomenology of place points toward conceptual and methodological reciprocity between the general and the specific, between the fundamental and the particular, between conceptual and the lived. this convincing "fit" among levels is a hall mark of the best phenomenology. (Seamon & Sowers 2008)

Pattern language, the monumental work of Alexander and his coworkers, describes designs that help convert spaces into meaningful places with high potential for attachment. The pattern language is a theory of places. It describes ways of designing cities, neighbourhoods, homes, and ‘third places’ such as pubs, squares, small shops, and bus stops, all of which contribute to the genius loci of places and help to develop emotional bonds with them (Lewicka 2011)

Also he has specified fifteen important criteria for nature of order, which are:

- Levels of scale
- Strong centers
- Boundaries
- Alternating repetition
- Positive space
• Good shape
• Local symmetries
• Contrast
• Gradients
• Roughness
• Echoes
• The void
• Simplicity & inner calm
• Deepinterlock & ambiguity
• Notseparateness

Alexander theory is important for researchers who wants to know how places create their meaning. (Lewicka 2011)
This principles helps to have wider view to the place and its order.
In his four volume final work “the nature of order”, he described fifteen basic principles for the organisation of the universe, on all levels of places, that stand behind the human experience of order, coherence, and life. The basic concepts which forms his theory are: life, integrated whole, strong centres and patterns of living structures. The idea of order nature shows that all phenomena are classified into living and nonliving structures. (Alexander et al. 1977)
In the other hand the principles of Alexander have been accepted by phenomenologists of place, such as Seamon (2002), and Salingaros (1999-2006) who is a long life friend and coworker of Alexander. According to his interpretation of fifteen Alexander fundamental principles of order, he created three basic quantifiable laws, with the aim of making them sharper and focus by complementary direction (Lewicka 2011): Law1: Order on the smallest scale is established by paired contrast elements, existing in a balanced visual tension; Law2: Large-scale order occurs when every element relates to every other element at a distance in a way that reduces entropy; Law3: The small scale is connected to the large scale through a linked hierarchy of intermediate scales within a scaling ratio approximately equal to $e = 2.7$ (Salingaros & Mehyffy 2006, P.30)
The first two laws rule the two extremes of scale (very small and very large) and third law is linking of all different scales. (Salingaros & Mehyffy 2006, P.30)
In this study, after examining the existing literature on the subject, a theoretical framework will be developed. Accordingly, the physical and visual effective components on phenomenological laws for sense of place and environmental aesthetics, in urban abandoned railways have been reviewed through quantitative method and via questionnaire. It can help to identify universal properties of places that give rise to aesthetic appreciation, meaning, and place-related emotions.
Phenomenology of place according to Norburg-schulz theory

2.1 structure of place

In this section, the most important trends are selected which Norburg-schulz has discussed about a structure of man made places and naturalistic places.

There are two kinds of place usage, concrete space (space as a three dimensional geometry), and space as perceptional field.

First, the perceptional field of the place is studied here first. The basic mode that word has given to the places, and the most comprehensive property of any place, is character of that (Norberg-Schulz 1980).

Adjectives like protective, practical, festive, solemn and etc, can describe a place character. Time elements can make effects on a place character which come with seasons, day & night, weather, and light. The character is determined by material and formal constitution of the place (how is the ground or how is the sky above our head or how are the boundaries which defined the place). Motifs like particular types of windows or doors and roofs may become “conventional elements”, which serve to transpose a character from one place to another. (Ibid.)

When man dwells, he is in space and certain environmental character at the same time. (psychologically, man should oriented and identify him self with the environment). Two psychological functions for understanding a place are called “orientation” and “identification”. Identification is the basis for man’s sense of belonging and feeling “free” helps to achieve this feeling in the place. In addition, the objects of identification are concrete environmental properties that is usually developed during childhood (Ibid.)

Albert Camus pointed out that three main elements of place, static physical location, human activities and meaning can make place identity (Relph 1976). Orientation is part of our nature (Norberg-Schulz 1980) and Lynch (1960) in his book, The image of the city, investigates the perception of urban landscape to provide new design principles for the development of the city.
He introducing concept of node, landmark, path, edge, district, as basic men’s orientations. Also, he has introduced ten important qualities of the cognitive space: singularity, simplicity, continuity, dominance, clarity of joint (emphasis on strategic intersections), directional differentiation (asymmetry), visual scope (view points) and motion awareness (to be aware of the speed of moving), time series (series experiences over time), names and meaning (Lynch 1960).

Environmental quality which protect mans against getting lost, is called by lynch imaginability which means that correct shape, colour or arrangement is highly useful in mental images of the environment. Accordingly all cultures have developed “system of orientation”, that is “spatial structures which facilitate the development of a good environmental image”. Often these orientations are based on natural structures. Where the system is weak, the image making becomes difficult, and man feels “lost” (Norberg-Schulz 1980, P.19)

Second part of this chapter is about concrete attributes and structure of the space.

In the natural places spatial and character of the place define by the way of extension of earth and sky. The attributes of the earth are so important for example, topography in physical configuration or surface relief in directions and defined spaces. Variation in the surface relief determined the spatial properties and to some extend landscape character. For instance “friendly” and “wild” depends on the texture of the ground they can be more noticeable or conversely. Interaction of vegetation, relief, surface and water, formed “places” or characteristic totalities. In the other hand the effect of sky is basically because of the two factors. Firstly the nature of the sky and its quality like light, colours, and the presence of characteristic clouds. Secondly its relationship to the ground, that is how it is appears, from below (Norberg-Schulz 1980, P.39).

Being of man made places starts from the boundaries and enclosure, and its character and spatial properties are determined by how it is enclosed. The spatial structure developed based on centralisation and longitudinally and their combinations. Two spatial patterns of particular interest are grid and labyrinth. The grid is an open orthogonal infrastructure of paths, which may filled in with buildings in different ways. The labyrinth instead, is characterised by a lack of straight and continuous paths, and a high density. It is traditional Arabic settlement pattern (Norberg-Schulz 1980, 58).

The outside-inside relation is a primary aspect of concrete space, implies varying degree of extension and enclosure.

Centralisation, direction and rhythm are other important elements of concrete space. Main directions in the concrete space are horizontal and vertical, that is the directions of earth and sky. Any enclosure becomes a centre, which may function as a “focus” for its surrounding. From the centre space extends with a varying degree of continuity (rhythm) in different directions. Any enclosure is defined by a boundary and a boundary makes a spatial structure visible as continuous or discontinuous extension, direction and rhythm (Norberg-Schulz 1980).

In the other hand man made places are related to nature in three ways: First, man wants to visualise his understanding of nature. Second, they want to completing situations by adding what is lacking and finally man wants to symbolise his understanding of nature.
2.1.1 The phenomena of places

Norburg-schulz believes that there are five basic modes of concrete natural understanding: thing, order, character, light and time. First one is more about creation and explain how things come into the being (things and forces). Marriage between earth and sky make differentiation of things and "Being the primary natural things, rocks, vegetation and water can make a place meaningful or “sacred”, to use the term of Mircea Eliade". Systematic cosmic order is the second mode of natural understanding. Such an order is usually based on course of the sun, as the most invariant and grandiose natural phenomenon, and the cardinal points like polar star. Also in some places it related to local geographical structure, like in Egypt south-north direction of Nile river is primary structure of man orientation.

The third mode of natural understanding consist in the definition of the character of natural places relation them to basic human feature. Its more in the structure of Greek landscape, by relating natural and human characters, the greeks achieved a reconciliation of man and nature. Each landscape is clearly delimited, easily imageable personality. The basic property of the Greek environment, therefore, is the individual and obvious character of places. For instance, to help for understanding a particular area that has feeling of protection, like surrounded area, Greeks personified them as particular gods. Fourth mode of natural understanding is light. Its basic part of reality, in Greek civilisation light was symbol of Knowledge, artistic and intellectual. In christianity its symbol of conjunction and unity which was connected with concept of love. Light, thus, is intimately connected with the temporal rhythms of nature which form a fifth dimension of understanding. The seasons, thus, change the appearance of places (in some region more and in some less). The temporal rhythms don’t change the basic elements which constitute natural places, but in many cases they contribute decisively to its character and are therefore often reflected in local myths and fairytales.

In the architecture of early civilisations we can feel more understanding of nature, that can described in terms of forces, order, character light, and time. The process involved in “translating” these meanings in to man made forms have already been defined as “visualisation”, “complementa- tation”, “symbolisation”, whereas gathering serves the somewhat different purpose of making the man made place become a “micro-cosmos”. In general we may say that man “builds” his world.

2.2 The spirit of place

A phenomenology of landscape causes reconsidering the concept of genius loci. It discuss about the qualities of the natural environment that meet together in place and create special character and style. Norberg-Schulz’s (1980) is one of the important attempt in this field, which establishes
phenomenologically a four-fold typology of places grounded in such qualities as spatial character, light, and daily and seasonal rhythms. (Seamon 1984)

These categories are abstractions which are hardly concretised in pure form, but they give general understanding of the spirit of place.

2.2.1 Romantic places

"Norberg-Schulz describes the romantic landscape, an environment of change, variety, and detail, best illustrated by the forests of Scandinavia" (Seamon 1984).

Original forces are still most strongly felt in this kind of environments like Nordic forest. The ground is rarely continues and have rich microstructures, the sky is hardly experienced, the sun is relatively low and create spots of light and shadows and the quality of air is continuously changing. Instability is emphasised by the contrast between the seasons and by frequent changes of the weather.

Therefore we can see natural forces, whereas a general unifying order is lacking. Nordic man has to approach nature with empathy, and he has to live and have interaction between man and his environment in an intimate sense and direct participation which is more hiding-place in nature and not social.

The Nordic landscape is therefore dominated by the earth. It is a chthonic landscape which doesn’t with ease rise up to approach the sky, and its character is determined by an interacting multitude of unintelligible detail (Norberg-Schulz 1980, 43).

This category cannot easily be understood in logical term and it is characterised by a strong atmosphere. It may appear mysterious but also intimate, idyllic, irrational and subjective. Its forms seem to be a result of growth rather than organisation, and resemble the forms of living nature.

Romantic space is more topological rather than geometrical. In urban level basic configuration is dense, free and undetermined cluster and irregular enclosure, also functions are in general way and without defined distribution. Strong romantic space needs continues and indeterminate geometrical boundary. In relation to the surroundings the romantic settlement is identified by the proximity of its element and general enclosure and are characterised by serrate and wild silhouette.

Romantic atmosphere and character has complexity and contradiction and outside and inside relationship is complex.

Simple, intelligible volumes are avoided and transformed into transparent, skeletal structures, where the lines becomes a symbol of force and dynamism. Light is used to emphasise variety and atmosphere (rather than comprehensible element) In general the multiplicity and variety of romantic architecture is unified by a basic condition which corresponds to particular formative principles. Romantic architecture is therefore, in lots of situations, very local. (Norberg-Schulz 1980) "Norberg-Schulz describes the romantic landscape, an environment of change, variety, and
Table 2.1: Summery for main factors of Romantic place

1. Forms are not organised, seems result of growth, configurations are free
2. Geometrical boundaries are undefined and uncontinued
3. It has complexity and contradiction in volumes and its character
4. Its more local
5. Has strong atmosphere and does not seem logical (its more mysterious and subjective)
6. It is more topological rather than geometrical
7. Original forces still strongly felt
8. Ground is rarely continues and have microstructures and place is dominated by earth
9. Man has direct participation with nature (not social)
10. General unifying order is laking

detail, best illustrated by the forest of Scandinavia” (Seamon 1984). In table 2.1 we can see mixed of the most important attributes of romantic natural landscape and man made places.

2.2.2 Cosmic place

This category is monotone, like desert with camels scene. For the desert dweller the genius loci is manifestation of the absolute. Uniformity and absolute order is its main feature. The only surprise in desert is sand storm but its also monotonous because it doesn’t represent the order; it hide the world and not change it!

Forms are static rather than dynamic. It aims at necessity rather than expression. Its strictly geometrical and usually it is concretised as regular grid or cross of orthogonal axes and its uniform and isotropic.

Some times it doesn’t defined goal-oriented direction and knows as inversion space and labyrinthine space (it rests in without beginning and end) Strong cosmic space demand a clear visualisation of the system. In relation to the surroundings it may remain open, as it doesn’t take local microstructure into consideration.

The character of cosmic architecture is distinguished by abstraction and try to dematerialise volumes, and surfaces by means of “carpet like” decoration (mosaic, glazed tiles, etc.)

The major manifestation of it is in Islamic architecture. In interior space, it manifest in ideal world, paradise of white, green and blue (colours of pure light, vegetation, and water which is goal of man desert journey) (Norberg-Schulz 1980 45).

In table 2.2 we can see mixed of the most important attributes of romantic natural landscape and man made places.
Table 2.2: Summery for main factors of Cosmic place

1 Uniformity and absolute order
2 Its monotone and it does not have complexity
3 It has logical system and seems rational and abstract
4 Its geometrical and concretised as regular grid- its uniform and isotropic
5 No defined goal direction but it have clear visualisation of the system
6 Have open relation with its surrounding and does not have local microstructures
7 Has abstract character, try to dematerialise volumes (carpet like)
8 Interior space use ideal world elements

2.2.3 Classical place

Its neither characterised by monotony nor by multifariousness , its more composition of distinct elements . In general it may describe as a meaningful order of distinct, individual places. The single Greek landscape is naturally dearly delimited unit, which seems an integrated totality. The classical landscape therefore makes a human fellowship possible , where every part conserves its identity within totality. The individual is not abstract or hiding its privacy, its true “gathering” which fulfils the most basic aspects of dwelling. Reconciliation or harmonious equilibrium of earth and sky is manifest in this landscape.

It has imaginability and articulate order and logical organisation. The forms are organic. It seems they have organised composition of individual elements, but also give man feeling of belonging and freedom. Classical space mix topological and geometrical properties. The individual building may has geometrical order in its basic identity, whereas the organisation of several buildings is topological, somehow a democratic freedom is expressed. Classical architecture describe by means of perspective, and there is absence of a dominant system, and it space may defined by increasable grouping of individual places. In relation to surrounding classical settlement appears as a different, special presence. All parts have they own individual identity, and in the same time each character forms part of a family character which is related to a human quality. Light is used to give emphasise to the parts and the whole by means of a play of light and shadow , which models the forms. In table 2.3 we can see mixed of the most important attributes of romantic natural landscape and man made places.

Table 2.3: Summery for main factors of classical place

1 Has coherency and imaginable order
2 Has logical organisation
3 Forms are like organic life (neither static, nor dynamic)
4 Good composition of individual elements and places
5 Is mix topological and geometrical properties (democratic freedom)
6 All parts have they own individual identity, every part conserves its identity within totality
7 Equilibrium of earth and sky is manifest in this landscape
2.2.4 Complex place

Some times romantic, cosmic, classical landscape hardly appear in pure form, but participate in various kinds of syntheses. The possibilities are vast and determine a corresponding multitude of existential of meanings.

The complex landscape, a blend of the first three and ultimately best representing most actual places, which generally are never pure but mixed in their natural expression (Seamon 1984).
Chapter 3

Explanation of Alexander’s theory

3.1 Meaning of place

Alexander theory is important for researchers who wants to know how places create their meaning. In his four volume final work “the nature of order”, he described fifteen basic principles for the organisation of the universe, on all levels of places, that stand behind the human experience of order, coherence, and life. (Lewicka 2010)

Alexander is well-known on designing and building process due to his books. In this part we are going to discuss about the Phenomenon of Life (Nature of Order Book One). Alexander suggested a theoretical view of existing tangible degrees of life in all spaces. He also tried to set this understanding of order as an mental basic for architecture. His fifteen concept trying to ask this question that what must be done to create more life in our world (From small scale like our room to large scale like a region).

He introduced a concept of living structure, basing it upon his theories of centers and of wholeness, and defined the fifteen properties. Alexander described the living structure in both personal and structural aspects. Based on the idea of order nature, He regards all the phenomena of universe in living structures and nonliving structures and takes the patterns of living structures in terms of total whole and strong centers.

Alexander and his coworkers in (Alexander et al. 1977) described designs which can be meaningful and create places with high potential for attachment. The pattern language is a theory of places. It describes ways of designing places with different scales, and help to develop genius loci and emotional bonds between people and places. Alexander believed that people feeling is mostly the same in the same situations, and of course there is some different feelings in our character (Lewicka 2011, 223).

The basic concepts which forms his theory are: life, integrated whole, strong centres and patterns of living structures. The idea of order nature shows that all phenomena are classified into living and nonliving structures (Alexander 2002). Life is a general condition which exists in every parts of space like: brick, grass, river, human being and further. The point is that every part of space
and its connected region, small or large, has some degree of life which is well defined, objectively existing, and measurable. (p.77)

Life comes from this reality where thing acts as an integrated totality which means that we see it as a part of interconnected chain. In one of his researches he focused on “Deep structures”. He believes that there are two types of order, one is functional order and the other one is formal order. These are properties of space. Examples of functional order and formal order are “coke vending machine” and Chiny vase respectively. These two types of order make relationship with design and human and feeling which is called “Wholeness”. In a good design this wholeness can be find in every parts of the structure. (p.80)

Centre is a structured field in space that has separate parts, each of these parts has relationship to each other in complex ways as part of linked orders. He has an example that a tree as a whole, made up of roots, trunk, branches and so on. Each of these components can be as a centre which is called tree. further , a tree is a centre within larger wholes like forest or wood lands. "Each pattern describes a problem which occurs over and over again in our environment, and then describes the core of the solution to that problem, in such a way that you can use this solution a million times." (Alexander et al. 1977)

3.2 Alexander’s fifteen basic quantifiable laws

The Alexander theories are explained briefly in the following:

Level of scale: Relationship between different levels of scale, places with different scales and bounded levels make a deeper sense of levels while centres are created according to them.

Strong centres: It is a primary source of place strength and attract attention. Centres can be various and symmetric since each centre is represented as a square which is beyond a local symmetry. Necessarily geometric centres are not strong centres, strong centre requires a special field effect, created by other centres.

Boundaries: living centres are shaped by boundaries. The way that the field-like effect of a centre is strengthened by the creation of a ring-like centre, made of smaller centres that surround and intensify the former. They act for separating and linking, boundaries make attention for the centre and on the other hand the limited centre is integrated by linking to the beyond world. (p.158-164)

Alternating repetition: Centres will strengthened if they are emphasised through primary centres’ rhythm.

Positive spaces: The simplest and necessary feature which is prominence of each particle to the outside.

Good shape: The feature of good shape is dependent on centres of each part which has a certain and defined form. In order to have a good form, all forms have to be definite after analysis and characterisation (Ibid: 179-185).
Local symmetries: Local and general symmetry supplements for maintaining a whole. General symmetry helps to understanding of all parts of the space and it comes from arranged local symmetrical groups.

Deep interlock and ambiguity: strength of a centre can be increased if it be close to another strong centres. In this situation a kind of ambiguously will happen between them. Ambiguity and solidarity appear with the near centres and the centres will be interpreted as an important points in the place (Ibid, 195-199)

Contrast: conflict in living substances and centres course its stability and strength. In fact with contrast a shortness and kind of strength will appear between place character and its surrounding. It can be create in different shapes like black and white, full and empty, etc. The important point of creating contrast in a centre is protecting integration and cohesion of the spaces. Gradient: changing the distance, size, intensity and features make a centre stronger. hierarchy makes variety of centres and shows better its internal totality and its field effect. (Alexander,2013:205-209)

3.3 Salingaros three basic quantifiable laws

“Alexander’s fundamental principles of order underlie his earlier ‘patterns’, which may be viewed as their concrete exemplifications. The principles have been accepted by phenomenologists of place, such as Seamon (2002), and Salingaros (1999-2006) who is a long life friend and coworker of Alexander. According to his interpretation of fifteen Alexander fundamental principles of order, he created three basic quantifiable laws, with the aim of making them sharper and focus by complementary direction (Lewicka,2011):

Law 1: Order on the smallest scale is established by paired contrasting elements, existing in a balanced visual tension;

Law 2: Large-scale order occurs when every element relates to every other element at a distance in a way that reduces entropy;

Law 3: The small scale is connected to the large scale through a linked hierarchy of intermediate scales within a scaling ratio approximately equal to $e = 2.7$ (Salingaros, 2006, p. 30)”

The first two laws rule the two extremes of scale (very small nd very large) and third law is linking of all different scales. (salingaroos,2006,p.30)

First low:

The building is result of complementary. coupling keeps opposites close to each other but doesn’t allow them to overlap, because they would mutually annihilate (cancel each other) Local contrast in small scale establishing fundamental level of structural order. colour and geometry is the smallest perceivable differentiation.

Important consequences of first law:
• Basic elements have to be pair with each other, and should have shapes that permit them to make more complex shapes.

• Basic units are together by a short range force for having them as a whole. We need to using geometry for interlocking units with opposite and contrasting characteristics. For instance by having one of these attributes, one cannot say which is which and it's difficult to separate basic units: shapes (convex, concave), directions (zigzag), Colour hue (red-green, orange-blue, violet-yellow) and colour value (black-white).

• Patterns generated when contrast pairs of units repeat and they alternate to interlock.

• A region of detail will need to contrast with a plainer and simple region for better readability.
  Second low: Interaction, rearrangement, symmetry and adjustment along one axis leads to higher order for large scale structure and reducing entropy. Small-scale order comes from coupling units that are touching each other, whereas large-scale order comes from relating units that are not next to each other. Understanding a complex whole, give us knowledge about environment, whereas meeting something that is too disconnected to easily understanding leads us to frustration and anxiety.

  The consequences of second low:

• Entropy is lowered by raising the number of local symmetries. (disorder is lowered by having many symmetries). Ordering generate multiple internal symmetries

• Grids help us to have structural order. Continuity of patterns with structural transitions increase the degree of connectivity. Two different regions can be ties together with two common similar patterns.

• In the absence of a physical force between areas, visual similarities like common colours, shapes and size, can harmonise local contrast and connect two design elements.

• Insisting on visual “purity” can destroy the connection process, whereas impurity increase the structure and is a useful property to make place semiconductor. Second law makes it easier to understand visual interaction of two objects which are
separate but close. Indeed the brain sees the proper connections for a coherence structure.

Third law:
The third low of structural order propose the idea of scaling similarity, which is what links the hierarchy together. It says hierarchy links the small scale to large scale and make visual coherence. Repeating forms and patterns at different scales and magnifications can virtually relate surfaces to each other. According to this low ordered growth is possible only if there is a simple scaling that the basic replication process can be repeated to create structure of different levels. These different scales must be exist, and they must be related preferably by only one parameter. Using the scaling ratio e as this parameter fits both natural and man made structures.

• Every units will be fitted to larger unit of the next scale in size. This leads to very wide boundary or frame for each element in design and it create hierarchy of wide boundaries in a whole. (the emergence of a wide boundary or frame)

• Similarity in shapes should link the different scales together, like repeating same curves or patterns at different sizes and scales.

• Different scales can define a gradient through focusing similar shapes of decreasing size. When structural gradients defined by the scaling ratio, these succeed better.

• A building must be fit in to the environment and nature with the defined existing scale of its surround.
  Buildings that have this scaling rule are mach with natural and biological forms. As a consequence, psychologically they appear more beautiful and comfortable.
  This three lows can apply to both natural and man-made structures. They may be used to create buildings that are match the emotional comfort and beauty of the world’s great historical buildings. This laws are evidence in the architecture from all parts of the world, but not with many of the architectural forms of the past seventy years.

3.4 Main questions

A review of litterateurs about sense of place, might classify factors which influenced on creation or improvement of sense of place that comes in follow: Physical factors, Social factors, Cultural factors, Personal factors, Memories and experiences, Place satisfaction, Interaction and activity features and Time factor. What will come eventually is that place attachment is one of the sense
of place subsets. Thus in encounter of people and place if assume people sense of place a
general feeling to that place, place attachment is a positive emotion which people have about the
place (Brown et al., 2015).
The goal of this paper is to evaluating the factors that has introduced by the phenomenologists in
this field. Finding the characteristics that are mostly important for people to analyze the main
design elements. The research questions are:

1. What are the main factors and visual dimensions of sense of place in landscape at a range
   of scales?

2. Can phenomenological approaches be used to help to identifies the specific aspects of
genius loci in the landscape?

### 3.5 Theoretical framework

First, study starts with basic definitions of space, place, atmosphere and styles of physical
environment, that has defined by Norberg-Schulz (1980). After that by using of Lynch (1960)
theory about cognitive space and imagibility of spaces, place identification has been discussed.
In the other hand Relph (1976) explanation about different modes of experiences has been studied.
These theories are more about perceptual parts of the spaces and for physical character of
space that effect on this perceptions we have discussed Norberg-Schulz (1980), Alexander (1977)
and Salingaros (2006). Norberg-Schulz (1980) theory discuss about genius loci and place
phenomenology, Alexander (1977) and Salingaros (2006) theories introduce design elements that
can create places with high potential of attachment by order and environmental aesthetics (Lewicka
2011). According to the theories of Norberg-Schulz (1980) and Salingaros (2006), each of
specified sample of places were evaluated in terms of the degree of presence thematic attribute:

<table>
<thead>
<tr>
<th>No.</th>
<th>Attribute</th>
<th>Theorist</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Uniformity</td>
<td>Norberg-Schulz</td>
</tr>
<tr>
<td>2</td>
<td>Complexity</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Mysteriousness</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Geometry</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Relationship with nature</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Domination of earth or sky</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Contrast and interlock</td>
<td>Salingaros and Alexander</td>
</tr>
<tr>
<td>8</td>
<td>Entropy</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Hierarchy and proportion</td>
<td></td>
</tr>
</tbody>
</table>
4.1 Methodology

4.1.1 Concept of research

The main concern in this study, is to finding the most important visual factors that can be understand and interpreted, when we look at a picture of a region or large scale landscape. By learning from experts in the field of genius loci and meanings of the places, collection and analyzing detailed information has been done. In this regard, by using of descriptive and library method, the research examines the components affecting the genius loci in places.

The framework that comes out in this study, indicated general atmosphere, physical style and characteristic of place that defined by Norberg-Schulz. In the other hand according to Relph theory this study is close to cognitive and abstract mode of experience, because participants are not in close relationship with the samples and their cognition comes from pictures and maps. Therefore the meaning of the places for each participants only comes from physical and visual aspects of the places and its more relate to environmental aesthetics. In addition, after fifteen specified concepts of Alexander(2002) about phenomenology of place and meaning of that, we discuss about Salingaros theory which developed Alexander theory in the sharper way. In the end, nine attributes that has effect on our cognition about genius loci comes out.

4.1.2 Study locations and participants

Thirteen experts of landscape architecture,(5 International and 8 Iranian) were asked to completing and filling the questionnaire for fifteen picture of specified place samples. Each sample were evaluated through nine attribute, and totally, participants were answer to 135 questions about visual attributes of genius loci in the places.

Among fifteen samples that are selected for this study, some of them has been used by Norberg-Schulz in "Genius loci: Towards a phenomenology of architecture" book as example of romantic, cosmic, classical and complex categories. The others have been chosen randomly based on them.
Eight of them are in Iran and seven of them are in Europe. Each picture has shown general atmosphere of the places in different scales.

4.1.3 Data collection

In this study by using of survey and questionnaire method, scenic quality assessment has been done. It should be noticed that the survey is publicly available at https://docs.google.com/forms/d/1wQxS4xXGc88UIiVEOd8uqeld9sp04Jw_3zQ1Jc92Cgg/edit. According to research section, nine concepts that have effect on genius loci comes out. Grading of each component is from 1 (extremely low) to 5 (Extremely high), for one specific factor. Rate one shows that the area is Completely compatible with that attribute and rate 5 shows lake of that attribute. Therefore the concepts that can be easily seen, will get the highest grade. The average rate of each component, has been calculated for each picture and it has shown on a radar graph. Also in the appendix section, participants grading for each place sample are exist. Any of the graphs indicated average level of participants cognition about all concepts, for every area samples. Each axis of radar chart representing one of the variables. It is from zero starting point in the middle to five (extremely low to extremely high). The components which have more area are more important in that particular place.

4.1.4 Descriptive analyses

Among all of these fifteen samples, Four of them are in romantic category, five in classic category, four complex and two are in cosmic category. Four radar graphs comes out, that each of them has average of common attributes for each category. In the end, according to graph 4.20 and table 4.2, the most important attributes in the defined category has specified.

4.2 Results and discussions

Figure 4.1 till 4.15 in this section, indicate average rating of thirteen participants about one specified place. Figure 4.1 displays average of thirteen opinions on nine factors of genius loci components in Santorini volcanic island of Greece’s mainland. It can be seen that presence of the contrast and interlock (because of the balanced visual tension), domination of sky (because of the slope) and also its relation ship with nature are in the high level of occurring. In the appendix section we can see this attributes doesn’t have similar value for different participants. For instance, feeling of contrast and interlock in user no.6,5,8,9 and 10 is in the Medium and low rate. It seems that this colour contrast doesn’t made interlock for some participants. specially this causes distracting for user no.5 and 4, which means that some times contrast and interlock of colours may increase.
entropy in some people. But generally users feel interlock in the high and extremely high level and entropy in the low and extremely low level.

Figure 4.1: Santorini (Greek)

Figure 4.2 shows average of thirteen opinions on nine factors of genius loci components in Naqsh-e Jahan Square which is situated at the center of Isfahan city in Iran (Shogae n.d.). The average for geometry is in the extremely high level. Also uniformity and hierarchy in this place have high level (because of the symmetries). Continuity of rectangular patterns and existing grid of the place decrease degree of entropy in the place.

Figure 4.2: Naqsh-e Jahan Square (Iran)

Figure 4.3 illustrates average of thirteen opinions on nine factors of genius loci components in Masuleh village in the Alborz mountain range, in Iran (Masuleh n.d.). In this place relationship with nature is in extremely high level (because of its houses relationship with the earth). In the other hand its mysteriousness because it can not easily be understood in logical term make this area close to the romantic places. Also indeterminate geometrical boundary and its complexity
of structure, for instance yards and roofs are like pedestrian areas and they have both function, increase mysteriousness of the place.

In the other hand as we can see in the appendix chapter, entropy in this area for some users like user no.8,9 and 3, is between medium and high level.

Degree of hierarchy and proportion is in the high level and also its uniformity (because the forms of the buildings and their materials are repeating).

Figure 4.3: Masuleh (Iran)

Figure 4.4 shows average of thirteen opinions on nine factors of genius loci components in Charles historic bridge in Czech Republic. Domination of sky and openness average rate is close to the extremely high-level. In the other hand its mysteriousness has the lowest rate because of its meaningful structure and imaginability. Charles Bridge has feeling of identification and logical orientation (Norberg-Schulz 1980). Also because of its openness, equilibrium of earth and the sky is manifesting in this area clearly.

Figure 4.5 displays average of thirteen opinions on nine factors of genius loci components in Nashtifan a rural district in Iran. this area is manifestation of cosmic landscape, because of its configuration and no defined goal direction. The domination of sky and uniformity or monotonous is in high level. One of the most important factors in this area is its mysteriousness which should not feel in cosmic category, but it has felt by participants.

Figure 4.6 shows average of thirteen opinions on nine factors of genius loci components in Ekbatan planned town in Iran. Uniformity of this area is extremely high and it does not have entropy. But other factors which increase genius loci are in the week situation.

Figure 4.7 illustrates average of thirteen opinions on nine factors of genius loci components in "The bridge of thirty-three spans " in Iran. It has extremely high geometry and also high level of mysteriousness because of the rows of 33 arches and feeling of closeness under them. Uniformity and hierarchy is strongly felt because of its configuration and classical plan. Also for its nested...
structure, domination of sky and openness is low and complexity is in the high level.

Figure 4.8 shows average of thirteen opinions on nine factors of genius loci components in Abyane village in Iran. Graph of this area is close to the Masoole figure 4.3 in all attributes. Figure 4.9 illustrates average of thirteen opinions on nine factors of genius loci components in a large park in Iran. It an artificial lake which is surrounded by four sides pathways (El-Göllü n.d.). Its hierarchy and proportion because of its boundaries and defined centers are strongly felt. Also echos, good shape, local symmetries, and level of scale (from fifteen concepts of Alexander) can be seen strongly.

Figure 4.10 shows average of thirteen opinions on nine factors of genius loci components in typical Norwegian landscape. Because of its non organized forms, free configuration and
Figure 4.6: Ekbatan (Iran)

Figure 4.7: Si-o-seh pol (Iran)

Figure 4.8: Abyaneh (Iran)
openness, the participants had attention to the sky. The rate of its geometry and complexity is low. But its mysteriousness is in medium level, which is not compatible with the romantic landscape attributes.

Figure 4.9: El-Gölü (Iran)

Figure 4.10: Norway

Figure 4.11 illustrates average of thirteen opinions on nine factors of genius loci components in Yazd old town, known as "City of Wind catchers" (Yazd n.d.). Its uniformity and geometry has high level because of its architecture and material that have been used in the place. In the other hand complexity, mysteriousness are also in high level, that shows the area has strong relationship with the ground and its desert surroundings. Selecting the colour and material of the ground, using them in the buildings, and presence of its wind catcher in the area indicated high level of its adaptations to its environment.

Figure 4.12 shows average of thirteen opinions on nine factors of genius loci components in Alberobello town with buildings of dry stone in southern Italy (Alberobello n.d.). As we can see in this figure the entropy has low level because its colour contrast, increased readability of the
place, therefore its uniformity is also in high level. In the other hand its geometry and interlock have close relationship because it made short rage force between basic units, according to the first low of salingaros (2006).

Figure 4.11: Yazd (Iran)

Figure 4.12: Alberobello (Italy)

Figure 4.13 illustrates average of thirteen opinions on nine factors of genius loci components in Júzcar blue painted town in the southern Spain\(Júzcar\text{ n.d.}\). Existence of the same colour for the buildings walls in the town can be a reason for extremely high rate of uniformity and also balanced visual tension and interlock between its elements.

Figure 4.14 shows average of thirteen opinions on nine factors of genius loci components in The Hallstatt village. This village located on the western shore of the Hallstatter Sea (a lake) in the Austria\(Hallstatt\text{ n.d.}\). The contrast and interlock component of the place is in the high level, which is because of the interaction between mountain and green earth with the lake. Also domination of sky and the relationship with nature are the others high level of presence.
in Acropolis of Athens, "an ancient citadel located on an extremely rocky outcrop above the city of Athens and contains the remains of several ancient buildings of great architectural and historic significance" (Acropolis n.d.). In this area the factors like relation to the surrounding, contrast and interlock, complexity, and geometry, got the medium rate which to some extend, its compatible with Norberg-schulz Theory about classical landscape and forms are like organic life (neither static, nor dynamic).
Place categories and presence of concepts:

In this part, average of attributes for similar places with four defined categories, has been calculated. Figure 4.16 till 4.19 shows all elements average.

<table>
<thead>
<tr>
<th></th>
<th>Romantic</th>
<th>Classic</th>
<th>Cosmic</th>
<th>Complex</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uniformity</td>
<td>3.6</td>
<td>3.3</td>
<td>4</td>
<td>4.2</td>
<td>3.82</td>
</tr>
<tr>
<td>Complexity</td>
<td>3.2</td>
<td>3.2</td>
<td>3.3</td>
<td>3.2</td>
<td>3.22</td>
</tr>
<tr>
<td>Mysteriousness</td>
<td>3.5</td>
<td>3</td>
<td>4</td>
<td>2.9</td>
<td>3.35</td>
</tr>
<tr>
<td>Geometry</td>
<td>2.8</td>
<td>3.4</td>
<td>3.6</td>
<td>3.3</td>
<td>3.27</td>
</tr>
<tr>
<td>Relationship with nature</td>
<td>4.3</td>
<td>3.3</td>
<td>3.8</td>
<td>3.5</td>
<td>3.72</td>
</tr>
<tr>
<td>Domination of sky</td>
<td>3.7</td>
<td>3.5</td>
<td>3.6</td>
<td>3.1</td>
<td>3.47</td>
</tr>
<tr>
<td>Contrast and interlock</td>
<td>3.2</td>
<td>3.3</td>
<td>2.7</td>
<td>2.9</td>
<td>3.00</td>
</tr>
<tr>
<td>Entropy</td>
<td>2.7</td>
<td>2.4</td>
<td>2.4</td>
<td>2.3</td>
<td>2.45</td>
</tr>
<tr>
<td>Hierarchy and proportion</td>
<td>3.4</td>
<td>3.5</td>
<td>3.5</td>
<td>3.3</td>
<td>3.42</td>
</tr>
</tbody>
</table>

Figure 4.16 indicate that relationship with nature and natural forces has the highest average amount of presence in the romantic places. Mysteriousness also is in the second degree of presence, because the forms seem to be a result of growth rather than organization.
In the figure 4.16 all components have almost the same value. Coherency and logical orientating in this type of places, reduce of its mysteriousness and complexity. Its freedom Democratic and equilibrium of earth and sky manifestation causes equal feeling of dominating of sky and relationship with nature factor.

In figure 4.17 despite Norberg-Shulz theory definition of cosmic places, participants rate mysteriousness and consequently, complexity in the high level. It shows that this feeling is related to how familiar are you with the environment. It is noticeable that low rate of entropy is an appealing for all types of places, but in cosmic category it has lowest average.

Complex places in figure 4.19 show that uniformity has extremely high level and as a consequence, visual proportion got the high rating. this category has all attributes together and in the reality most of the places are in this group because places hardly appear in pure form.
In figure 4.20, comparison of four categories is completely understandable. In the romantic landscape, relationship with nature, uniformity, and domination of sky have the highest level. In the classical places, hierarchy proportion, geometry and domination of sky are in the high level of rating. In the cosmic places uniformity and relationship with nature has the highest level. In the complex places (which is mixture of all categories), uniformity and relationship with nature are in high level.
Table 4.2: Extremely high appearance of attributes

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Appearance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uniformity</td>
<td>Cosmic. Complex</td>
</tr>
<tr>
<td>Complexity</td>
<td>-</td>
</tr>
<tr>
<td>Mysteriousness</td>
<td>Cosmic</td>
</tr>
<tr>
<td>Geometry</td>
<td>Classic</td>
</tr>
<tr>
<td>Relationship with nature</td>
<td>Romantic. Classic. Cosmic</td>
</tr>
<tr>
<td>Domination of sky</td>
<td>Romantic. cosmic. classic</td>
</tr>
<tr>
<td>Contrast and interlock</td>
<td>Classic</td>
</tr>
<tr>
<td>Hierarchy and proportion</td>
<td>Romantic. classic. cosmic. complex</td>
</tr>
</tbody>
</table>

Figure 4.20: Appearance of attributes
Conclusion

Visual evaluation for physical attributes of the place according to the phenomenological reports, doesn’t cover descriptions of individual experiences, but collected with the aim of discerning the essential features of the phenomenon under study (Lewicka 2011). The purpose of this study was to develop and test a framework of genius loci which integrates multiple approaches to place physical dimensions and its cognition. Whilst this research is not conclusive, but according to averages, in the 15 sample of places that we had discussed, Salingrose and Alexander’s theory are completely applicable to describing a place suitability and its environmental aesthetics. His three lows are completely tangible and they have direct relation with people perceptions. In general, some people with familiarity to the place, could identify more in compare with some people without familiarity but in fact this phenomenological approaches can help us for identifying physical aspects of genius loci and improving this feeling in all people.

The attributes like hierarchy and proportion, contrast and interlock are very perceptible for the participants. In the other hand Norberg-schulz Theory is very helpful for understanding a place but some how making clear differentiation between the categories that he has defined is not possible in some places, and as he has noticed in his book making this kinds of categorizing can help us to understand and reading places better. However they hardly appear in pure form, but participate in various kinds of syntheses and knowing the language of different places can be helpful for a landscape architecture and a planer to have a wider view and awareness (Norberg-Schulz 1980). According to averages, In the studied samples, first "Uniformity", second "Relationship with nature", and third "Domination of sky" received a higher grade, respectively. The attributes like uniformity, hierarchy and proportion in all categories was in the high and extremely high level of presence. It means that this two factors can help for orientation feeling and increase beauty. Repeating forms at different magnifications can create proportion and decrease monotonous in the design level. Entropy also is another element that is in low and medium level which can be achieve by having visual similarities, having many symmetries and grids. But the point is that in decreasing entropy, designer have to be concern about "impurity", because purity make the place vulnerable and weak (Salingaros & Mehaffy 2006). Domination of earth and sky is completely tangible in different kinds of categories, and its relate to openness and closeness. For
instance in classic and complex landscape the earth play more important role than the sky, and in the romantic and cosmic its opposite. About mysteriousness, this factor is very important in cosmic places and after that in romantic places; results showed that in the places that are more topological rather than geometrical, also in the places that are very local this attribute has been more felt (like Abiane, Nashtifan, Santaroni).
Bibliography


Figure A.1: Analysis of the first user opinions for all samples where U, C, M, G, R, D, I, E and H stand for Uniformity, Complexity, Mysteriousness, Geometry, Relationship with nature, Domination of sky, Interlock & contrast, Entropy, and Hierarchy & proportion respectively.
Figure A.2: Analysis of the second user opinions for all samples where U, C, M, G, R, D, I, E and H stand for Uniformity, Complexity, Mysteriousness, Geometry, Relationship with nature, Domination of sky, Interlock & contrast, Entropy, and Hierarchy & proportion respectively.
Figure A.3: Analysis of the third user opinions for all samples where U, C, M, G, R, D, I, E and H stand for Uniformity, Complexity, Mysteriousness, Geometry, Relationship with nature, Domination of sky, Interlock & contrast, Entropy, and Hierarchy & proportion respectively.
Figure A.4: Analysis of the fourth user opinions for all samples where U, C, M, G, R, D, I, E and H stand for Uniformity, Complexity, Mysteriousness, Geometry, Relationship with nature, Domination of sky, Interlock & contrast, Entropy, and Hierarchy & proportion respectively.
Figure A.5: Analysis of the fifth user opinions for all samples where U, C, M, G, R, D, I, E and H stand for Uniformity, Complexity, Mysteriousness, Geometry, Relationship with nature, Domination of sky, Interlock & contrast, Entropy, and Hierarchy & proportion respectively.
Figure A.6: Analysis of the sixth user opinions for all samples where U, C, M, G, R, D, I, E and H stand for Uniformity, Complexity, Mysteriousness, Geometry, Relationship with nature, Domination of sky, Interlock & contrast, Entropy, and Hierarchy & proportion respectively.
Figure A.7: Analysis of the seventh user opinions for all samples where U, C, M, G, R, D, I, E and H stand for Uniformity, Complexity, Mysteriousness, Geometry, Relationship with nature, Domination of sky, Interlock & contrast, Entropy, and Hierarchy & proportion respectively.
Figure A.8: Analysis of the eighth user opinions for all samples where U, C, M, G, R, D, I, E and H stand for Uniformity, Complexity, Mysteriousness, Geometry, Relationship with nature, Domination of sky, Interlock & contrast, Entropy, and Hierarchy & proportion respectively.
Figure A.9: Analysis of the ninth user opinions for all samples where U, C, M, G, R, D, I, E and H stand for Uniformity, Complexity, Mysteriousness, Geometry, Relationship with nature, Domination of sky, Interlock & contrast, Entropy, and Hierarchy & proportion respectively.
Figure A.10: Analysis of the tenth user opinions for all samples where U, C, M, G, R, D, I, E and H stand for Uniformity, Complexity, Mysteriousness, Geometry, Relationship with nature, Domination of sky, Interlock & contrast, Entropy, and Hierarchy & proportion respectively.
Figure A.11: Analysis of the eleventh user opinions for all samples where U, C, M, G, R, D, I, E and H stand for Uniformity, Complexity, Mysteriousness, Geometry, Relationship with nature, Domination of sky, Interlock & contrast, Entropy, and Hierarchy & proportion respectively.
Figure A.12: Analysis of the twelfth user opinions for all samples where U, C, M, G, R, D, I, E and H stand for Uniformity, Complexity, Mysteriousness, Geometry, Relationship with nature, Domination of sky, Interlock & contrast, Entropy, and Hierarchy & proportion respectively.
Figure A.13: Analysis of the thirteenth user opinions for all samples where U, C, M, G, R, D, I, E and H stand for Uniformity, Complexity, Mysteriousness, Geometry, Relationship with nature, Domination of sky, Interlock & contrast, Entropy, and Hierarchy & proportion respectively.