Analysis of Interactive Relations in the Shadows Structure

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Abstract:
All the phenomena of the universe, even the galaxies, have unique manifestations and distinctive external signs. The only way of understanding the world is to observe and understand these behaviors and external signs of the phenomena that surround us. Of course, signs and demonstrations of phenomena are a very small part of their entire existential truth. Also it is seen very often the signs of phenomena whose shadows mislead the scholar in a completely wrong way. It's almost impossible, unpredictable, and unlikely to have access to a large body of facts and phenomena. One of the most reliable behaviors of the phenomena that are justifiable by the investment to understand them is their repetition and continuity. Humanity tends to understand and justify these repetitions in the structure of models. Repetition helps human beings to develop structured models of recognition for phenomena. From a very small, to the galaxy scale, there are crumpled structures. The capacity to receive information in natural phenomena is infinite. The crumples are the result of the interaction of information in the field. The main purpose of this study is to understand the structure of models that are more knowledgeable than the past. These models have a crumpled structure and plunge a wide range of information.

Shadows are often concerned with the study of light and in inductive reasoning light has always been precedent respectively. From cited viewpoints, Shadow is deemed to be a secondary phenomenon and similar to when Comparing between full and empty, shadows are assumed to be the empty quality. In this manner shadows are always concerned to be a “lack of light” phenomenon, meanwhile shadows can be analyzed and inferred as an independent entity and an influential element in architecture.

This article introduces techniques for further understanding and analyzing shadows, also a different approach to the world of shadows has been presented which its new insight and profoundness leads to a novel understanding of spatial quality influenced by shadows as an independent quality. The results show that there is a direct and positive relationship between the architecture quality and light, and recognizing the interactions between these two has an indispensable importance in growth of productivity and richness in architecture. The research is a both descriptive and analyzing study and it is considered a qualitative research. The research method in this article is logical reasoning and it includes a path from analyzing data and understanding phenomenon to conceptual modeling.

It is an attempt to answer this question: How we can present more intelligent models via detecting and analyzing elements and new evaluation methods for interactive relationships between variable architecture elements and factors. There are many shadow making elements in hot climate of Iran which can be counted and exterminated. Any of this intelligent and delicate elements navigate a chain of information, thus without this continuity, information cannot be linked and disconnection of information is one of the main problems in today's architecture and its products. Some exam-able models in shadow use are porches, wooden structures named “shirsar” in roof edge, fractures in the body of building and courtyard, dome and green space.

Shadow has a successful and influential role in architectural characteristics and behaviors. Characteristics as coolness, graphical attraction, hierarchy, depth, graphical clarity, urban spatial quality, time and movement, contrast and theoretical discovery are only some of the examples which can be related to shadows. Shadows are like informative labels which are in flow and movement accompanying phenomenon and as the phenomenon stop moving and stay still, shadows keep moving. Shadows are harbingers for motion, life and dynamism. Fountain falls and dies at the time it stops its motion.

Interactive role of shadows as similar to other natural systems and organisms can be examined through different methods and at the same time this passage can be benefited in editing exam-able elements and parameters in human constructing processes. After evaluating historic architectural works which have reached to proximity and nearness with their own environment and climate, we evaluated and examined shadows and divided them in to three types. These three types were the shadows which were back to light, context shadows and interactive shadows. Meanwhile, in addition to introducing shadow quality and properties in architecture productions and its procedures, separate tables are presented for their recognition and identification. In this passage, tables below present multi directional influences of different elements on each other and the whole system.
Next, a three dimensional model of interaction between three types of shadow in watch stone of “sheikh Baha’i” is presented. This interactive model tries to demonstrate the concept and idea of happenings and events in an interactive pattern based on algorithmic Technics. In image 7 the conceptual model is presented based of an algorithm written in image 8. In two sides of these diagrams hours of day from 8 in the morning to 6 in the evening are presented, the right side belongs to the back to light shadows and in 12 pm this shadow reaches to 0 which is its minimum and after that there is no shadow till the next cycle. The left side of the diagram belongs to the context shadow which its quantity is on maximum on 8 am and gradually as it approaches to 12 pm the quantity decreases and on 12 pm at the time the back to light shadows reaches to 0, the context shadow similarly is 0 and they are both on their minimum and that is the time for experiencing lack of shadows.

This three dimensional model represents the surfaces of this diagram which are created in interaction between the back to light shadows and context shadows and result in compressed and tensed surfaces. The unpredictable result of this model represents the complicated states of interactive shadows which is under the effect of two other types of shadows. Dividing shadows into three types helps us to understand properties of interactive shadows and also remember not to ignore and disregard the edges of drawn diagrams and the surfaces in between which carry multi directional information. The inter-common edge of the two diagrams which is presented with darker color is the diagram of interactive shadow between the back to light shadows and context shadows. Meanwhile in stone watch of “sheikh Baha’i” as of the degree and status of the stone these shadows were hidden intentionally. (Proposed model is written by Grasshopper. This plugin (grasshopper) could be installed on another program called Rhino which works as a host, enables the user to write algorithms and see the results as a drawing outputs (2D or 3D) in this environment (rhino). Writing environment in grasshopper is all graphical and the factors in drawing in all phases of programming could be change and edit.)

Finally, the interactive shadows are elastic and flexible shadows which have the role of interaction and conduction between the two other types of shadows. Creating the diagram models which can represent the mutual interactions in addition to main variables, can have an indispensable role in understanding the complicated behaviors and characteristics of nature for designer and researchers. In this Technic as of numerous amount of variables and data and the multi directional calculations in this relationships, the intelligence of computers can be benefited in representing the complicated results.

Keywords: Shadow Analysis, shadow performance, interaction in shadows, interactive model.