

KINETIC BEHAVIOR OF INTERACTIVE ARCHITECTURE

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Abstract: *the article describes qualities and properties of kinetic behavior within framework of interactive architecture as one of the main features of interactive environment, considered from its' interaction with people and positive social impact point of view. Ability to change its' shape and adapt to new conditions is one of the key elements of creating new space, able to meet emerging users' needs. Since technical progress has allowed architecture to become dynamic, designers and architects seek for ways to bring life and motion into built environment, providing the opportunity of social interaction and maintaining a dialogue with users in real time.*

Keywords: *interactive architecture, kinetic behavior, social interaction, built environment, design.*

КИНЕТИЧЕСКОЕ ПОВЕДЕНИЕ ИНТЕРАКТИВНОЙ АРХИТЕКТУРЫ

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Аннотация: *статья описывает особенности и свойства кинетического поведения в рамках интерактивной архитектуры как одно из основных качеств интерактивной среды с точки зрения ее взаимодействия с людьми и положительного социального влияния. Способность менять форму и адаптироваться к новым условиям является одним из ключевых элементов создания нового пространства, способного удовлетворить новые возникающие потребности пользователей. С тех пор, как технический прогресс позволил архитектуре стать динамичной, дизайнеры и архитекторы искали способы вдохнуть жизнь в окружающую застройку и дать ей возможность взаимодействовать с людьми в режиме реального времени.*

Ключевые слова: *интерактивная архитектура, кинетика, социальное взаимодействие, окружающая застройка, проектирование.*

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Usually by animation we understand simulation of movement. Though in contemporary architecture (real or virtual) animation is understood as the change of parameters in time or “the act, process, or result of imparting life, interest, spirit, motion, or activity”. Greg Lynn states the difference between animation and motion as follows: “Where motion implies movement and action, animation suggests animalism, animism, evolution, growth, actuation, vitality and virtuality.”

Interactive design of the public environment engaged social and cultural dimensions of space. A lot of projects have utilized the medium to engage in political arena through participation. Designers often seek for chances to use spatially defining interaction as a mechanism to understand, shape and promote social interaction. The physical space can be used to include or exclude people from one another, to facilitate, dissipate, or focus crowds. In this way, in the realm of physical architecture, interactive public spaces can have a profound effect on social interactions. It is important to point out that a lot of projects in public sphere play big role in testing the durability of materials as well as the tie frame of particular interactive strategies within the context of unpredictable participants [1].

Some experiments in contemporary design were targeted on simulation of motion of the built environment not by capturing it, but rather enhancing, creating the interaction between user and building. A dense information network, realized by means of pneumatic engines and sensors, link external impulses into building responsive reaction. This causes buildings to be variable, transitory – unlike architecture conventionally was supposed to be.

The first attempt to bring real motion in architecture happened almost 100 years ago in design of Monument for the Third Internazionale by Tatlin in 1919, which was the kinetic structure, where a few platonic solids (cube, pyramid, cylinder) were rotating along a vertical axis at specific speed (1 rotation per year, per month or per day). The steel spiral of Tatlin tower was scheduled to be 400m high.

Since that time a lot of kinetic structures were realized, continuing this trend, by means of new advanced techniques the movement can be carried out in a more effective way. For example Kuwait Pavilion for Sevilla World Expo 1992 by Santiago Calatrava, with its' mobile structure and many other cases of motion in

architecture, built in recent years, becoming more and more complex with higher ability to react, move faster, more smooth and recognize triggering from users or being activated via remote data input.

Kas Oosterhuis' is one of the front men in experiments with virtual environment and interaction of the space and visitor nowadays. His experiments with interactive architecture, like Trans-ports (2001) and E-motive house (2002) proves, that interactive, animated architecture becomes feasible reality. They define possible direction of future research and implementation. The first object "acts like a muscle", connected to data (input-output devices) in real-time. It uses three main elements: electronic interior skin, pneumatic "muscles" and flexible exterior skin. Instead of being static, it is rather like a lean device, which relaxes or tightens upon different forces [2, 3].

E-motive house is a weaving loop between a hard and a soft structure. The construction of the house and the furniture can be programmed in any desired way. Almost all the elements, except for kitchen and bathroom, can be changed and modified. The house acts like an interactive adaptive system. Among many well-known interactive projects one might place as well Aegis Hyposurface (dECOi, 1999-2001), Tower of Winds (Toyo Ito, 1986) and Saltwater Pavilion (Kas Oosterhuis, 1997).

Motion in architecture can be understood literally. Kas Oosterhuis' project for Graphisoft Slider (2002) is a set of programmable sliding volumes, demonstrating unique and not yet experienced structural behavior. The main idea of this project relies on retaining the two old concrete crane slider bars and establishing a new mobile construction on the top of it. There are four main elements (oval cage, yellow glass box, cloud-shaped functional blobs and mediatube) moving independently in continuous, unpredictable motion. The body of the project is always in motion, dynamic, alive and programmable.

Urban scale projects have changed according to the new trends as well. Traditional city concept is now influenced by trends of a hypercity, where new shops grow up and replace the old, where old squares disappear and a new perspectives arise within a months, all happens in sake of improving the social interaction and mace infrastructure of the city, built environment and public space important participants in this social relationships. This state of transformation is enhanced and supported by a network of information connections. A building, a city, an airport, a car, a human has become only a node, a vertex of a whole system, constantly moving.

Using emerging images, light, sound, moving and changing its spatial configuration intelligent space makes the user sink into the atmosphere that is created for each of the activities taken within it and able to project information in the outer shell. Smart environment proposes the whole situation for the user to get involved into this conversation with the space, full of information, hidden or exposed possibilities, choice of activities, details, games and even jokes and allusions that the user is free to intemperate as his intelligence, experience and sense of humor lets him to [4].

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