Motion & Architecture

This introduction can be divided into 3 parts:

1. In Part 1, I would like to explain that “Motion” has became a very important topic of contemporary Architecture and we can find some relationship between “motion” and many other concepts such as “perception”, “body”, “time” and so on which have been discussed in Architectural theories.

2. In part 2, I think “motion in design” can be developed as a very useful tool in the Architectural practice because it is a direct and inspiring way in Architectural expression, analysis and generation.

3. In part 3, I made a short list of the research achievements about this topic which can be found now. The standard of my choices is not very strict and some of them may be very different from which we are going to do.

1 Theories maybe Helpful

1) Since 1900: Modernism, Anti-modernism, Post-modernism
   - Architecture as Space (“Architecture as Space” By Bruno Zevi)
   - Architecture as Machine (“Towards a New Architecture” By Le Corbusier)
   - Architecture as Signal (“Peter Eisenman: Houses of Cards” By Peter Eisenman)
   - Architecture as Events (“The Manhattan transcripts”, “Event-cities 1/2/3/4” By Bernard Tschumi)

2) Contemporary Architecture
   - Architecture as Media (“Blur: the making of nothing” By Elisabeth Diller & Ricardo Scofidio)

And Others...
• “Architecture's New Media: Principles, Theories, and Methods of Computer-Aided Design” By Yehuda E. Kalay
• “Privacy and Publicity: Modern Architecture as Mass Media” By Beatriz Colomina
• “The Organizational Complex: Architecture, Media, and Corporate Space” By Reinhold Martin
• “This is Not Architecture: Media Constructions” Kester Rattenbury
• “The Media City: Media, Architecture and Urban Space” By Scott McQuire

(From “Blur: the making of nothing” By Elisabeth Diller & Ricardo Scofidio)

3) About Motion: Time/Space/Body/Perception/Performance/Instantaneity

• “Histories of the Immediate Present: Inventing Architectural Modernism” By Anthony Vidler
• “Manifesto for a Cinematic Architecture” By Pascal Schoning
  Cinematic Architecture is a manifesto for an architecture that transforms solid material into the appearance of energy and spatiality. Its main building material is light and its ultimate aim is to achieve an ethereal state which only becomes real when it is energized by the person who occupies it.
• “Cinema 1: The Movement-Image” By Gilles Deleuze
• “Cinema 2: The Time-Image” By Gilles Deleuze
• “Questions of Perception: Phenomenology of Architecture” By Steven Holl
• “Phenomenology of Perception” By Maurice Merleau-Ponty
2 Application

1) Expression
   Modeling&Rendering&Animation

2) Analysis
   Representation
   Lay and Overlapping (“Transparency” By Colin Rowe)
Transparent Vision

(From "Design Analysis and Expression" By Professor Han Dongqing, SEU)

Slides
Transformation ("Diagram Diaries" By Peter Eiesnman)

Rotating
Stretching
Twistin
Shifting
Folding
Inversion

(From the lecture “Design Analysis and Expression” By Professor Han Dongqing, SEU)
3) Form Generation

Moving Scene

(From “Blur: the making of nothing” By Elisabeth Diller & Ricardo Scofidio)
Changing Environment

(From “Blur: the making of nothing” By Elisabeth Diller & Ricardo Scofidio)
Reception & Reaction
3 Publication

1) Paper
Motion as modern way of expressing architecture.
By Adam Gorczica

Abstract
There are many words written about the motion in architecture. (Giedion, Ferstegen, Jormakka, Lynn). They try to describe, classify, separate or represent it. This work presents motion as one of the leading factors of contemporary ways of expression in architecture. It will examine different examples of architectural motion, then make a hypothesis, that one of the possible reasons of expressing movement in architecture is the usage of new generation of modern CAD/3D-Animation software, like 3DStudio Max, Lightwave, Maya, Catia, Rhino, or Cinema 4D. Because of availability only chosen features and tools of CINEMA 4D will be described further. Motion can be expressed in architecture in two ways: by the procession or by superimposition. [Lynn,1998] In processional models of time, architecture is the immobile frame through which motion passes. It is based on static frames and have fixed relationships between functional program and user. The elimination of force and motion from form is the basis of recent alternatives (e.g. sequential model). Through the multiplication and sequencing of static frames it introduces the idea of “dynamic” architecture as multiply framed. 3 An alternate model of time and motion resists the separation of form from its animating forces. Form is perceived in a space of virtual movement and force rather than within an ideal equilibrium space. Instead of fixed prototype, a flexible,
mutable models are created, which are rather a potential of multiple variables ("performance envelope"). In result “architecture can be modeled not as a frame but as a mobile participant in dynamical flows.” [Lynn, 1998] To do that, necessary is more than a shift in technology, but rather a shift in sensibility from reduction to combination to compose time based, topological designs. Although the introduction of time and motion techniques into architecture affects visual qualities, it is inappropriate to understand technology in terms of style.

2) Paper
Architecture and Motion: Ideas on Fluidity in Sound, Image and Space
By Yolande Harris

Introduction
The relationship between music, image and architecture through space, time and movement has become a very significant theme in contemporary thought. This can be seen to stretch back to the Futurist manifesto and the emergence of film and the moving image at the beginning of the twentieth century (Marinetti 1910, Carra 1913).

In this paper I would like to present three complementary strands of research with relation to this central theme – a brief historical overview of the emergence of movement as a vital idea permeating all disciplines; the practical performance experiments with a new instrument called the Video-Organ; the relation to issues brought up by notation as the visualisation and communication of ideas across the disciplines. It describes a number of different practical attempts of coming to terms with the theoretical ideas and the performances in turn provide insights into relevant strands for future research.

Architectural methods of design and production have dramatically transformed as architects have absorbed new generative computer-based design tools that have introduced dynamic geometries and helped to bring alive the discourse of movement within architecture.

I have chosen the first word of the title to be architecture because of its unusual relationship with movement. Perhaps out of all three disciplines of music, visual arts and architecture, it is architecture that is at present coming to terms with the implications of movement. In my opinion architecture is offering some of the richest experiments and thorough discourse on the topic, although historically furthest from a time-based foundation.

Architecture and Motion is an attempt to create a balance between an historical grounding and an active participation in the general discussion, and although it is essentially a personal account I hope to contribute to the development of this multi-disciplinary field.

3) Paper
Living in Motion: Design and Architecture for Flexible Dwelling.
(exhibitions of Institute of Contemporary Art)
Kennedy, Alicia

4) Paper
Moving stories (Living in Motion, traveling show for design services and architecture)
Relph-Knight, Lynda
Design Week, April 12, 2007, p.32
5) Book
Flying Dutchmen: motion in architecture
By Kari Jormakka

Description
Since Vitruvius described in his famous work not only fixed buildings but also mobile objects and constructions, the possibility of incorporating change and motion into architecture has continued to fascinate architects. Yet it is only since radically new materials and IT media have been developed that the dream has become reality. "Flying Dutchmen" shows the way a selection of innovative Dutch architects have incorporated the issue of movement in their buildings. The examples are drawn by OMA/Rem Koolhaas, NOX Architects, Kas Oosterhuis, UN Studio, NL Architects, Bentham Crouwel, and Herman Hertzberger. The analyses provide a fascinating glimpse into the design process and its results, from sensitive surfaces to, dynamic spaces, from aerodynamic forms to interactively linked buildings.

About the Author
Kari Jormakka is Professor for Architecture Theory at the Vienna University of Technology and heads the architectural office Wombat.

6) Book
Move: architecture in motion--dynamic components and elements
By Michael Schumacher 1957-
And Oliver Schaeffer 1975-
And Michael-Marcus Vogt 1972-

Description
Dynamic components and adaptive elements are becoming increasingly important in contemporary architecture, and not just because of their visual effect. If architects and engineers are engaging more and more with the issue of movement - whether in the form of sun-tracking solar cells, lowerable walls, or intelligently programmed elevators - it's because they are busy exploring responses to three challenges: How can we control and reduce the energy requirement of buildings? How can we expand the range of possible uses? And how can we represent, illustrate, accommodate, and control dynamic movements in buildings? Designers and builders who seek to use kinetic components face technical and design challenges that aren't covered by traditional structural theory. For these users, this book presents the technical tools and constructional solutions that will allow them to implement these movements concretely and deploy them functionally within the domains of “Energy”, “Change of Use”, and “Interaction”.

First it lays out the fundamentals and design principles of kinetics in architecture, technology, art, and nature in a structured manner. In a third section, forty movable elements are shown in action, each on a double page - with specially prepared phase drawings and organized by type of movement, including rotation, sliding, folding, and transformation. The international examples from noted architects range from window mechanisms to solar protection and light redirection systems, movable walls and roofs, and movable civil engineering structures.

About the Author
Michael Schumacher is a professor of design and construction at the Faculty of Architecture and Landscape Sciences at University of Hanove; for more than twenty years, he has been a co-owner of the firm schneider + schumacher.

Oliver Schaeffer studied at the Technical University of Munich and MIT in Cambridge, Massachusetts (USA). He has worked at Michael Hopkins in London as well as at other firms and is presently a research associate at the Institute of Design and Construction in Hanover.

Michael-Marcus Vogt is also a research associate at that institute and does research on dynamic materials and applications technologies for adaptive facade systems.

7) Book

Zoomscape: Architecture in Motion and Media
By Mitchell Schwarzer

Description

Although a few among us are intrepid architectural tourists, visiting buildings and landscapes our cameras at the ready, most of us experience architecture through the windshield of a moving vehicle, the architectural experience reduced to a blurry and momentary drive-by. And the rest of our architectural "tourism" is through the images of cameras, movies, and television programs -- that is, through the lens of another's eye. Architectural historians Mitchell Schwarzer calls this new mediated architectural experience the "zoomscape." In this thought-provoking book, he argues that the perception of architecture has been fundamentally altered by the technologies of transportation and the camera -- we now look at buildings, neighborhoods, cities, and even entire continents as we ride in trains, cars, and planes, and/or as we view photographs, movies, and television. Zoomscape shows how we now perceive buildings and places at high speeds, across great distances, through edited and multiple reproductions. Nowadays, our views of the architectural landscape are modulated by the accelerator pedal and the remote control, by studio production techniques and airplane flight paths. Using examples from high art and popular culture -- from the novels of Don Delillo to the opening credits of The Sopranos, Mitchell Schwarzer shows that the zoomscape has brought about unprecedented and often marvelous new ways of perceiving the built environment.

About the Author

Mitchell Schwarzer is a professor of architectural history and visual criticism at California College of Arts and Crafts.