



PERFORMALISM

FORM AND PERFORMANCE IN DIGITAL ARCHITECTURE

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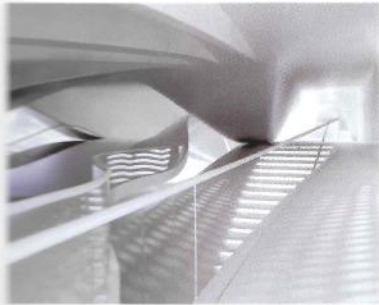


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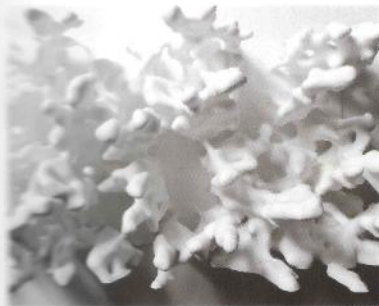
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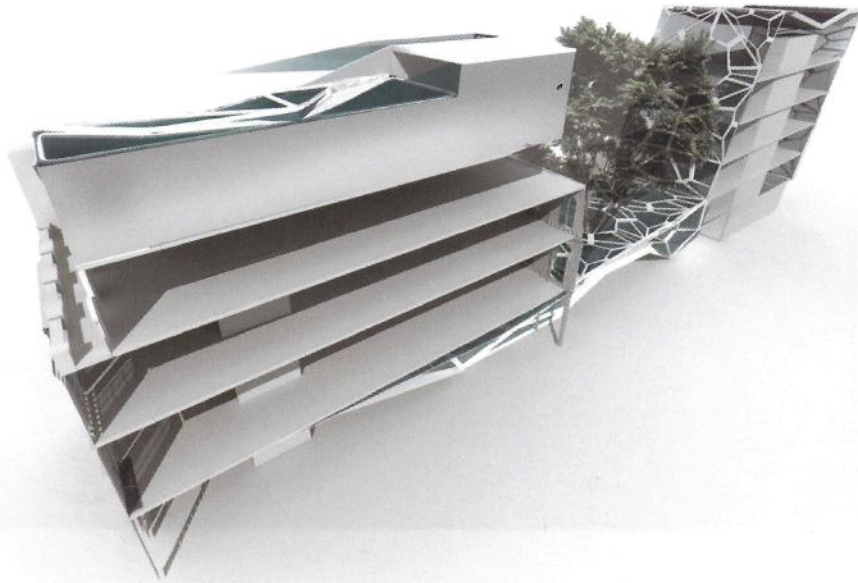
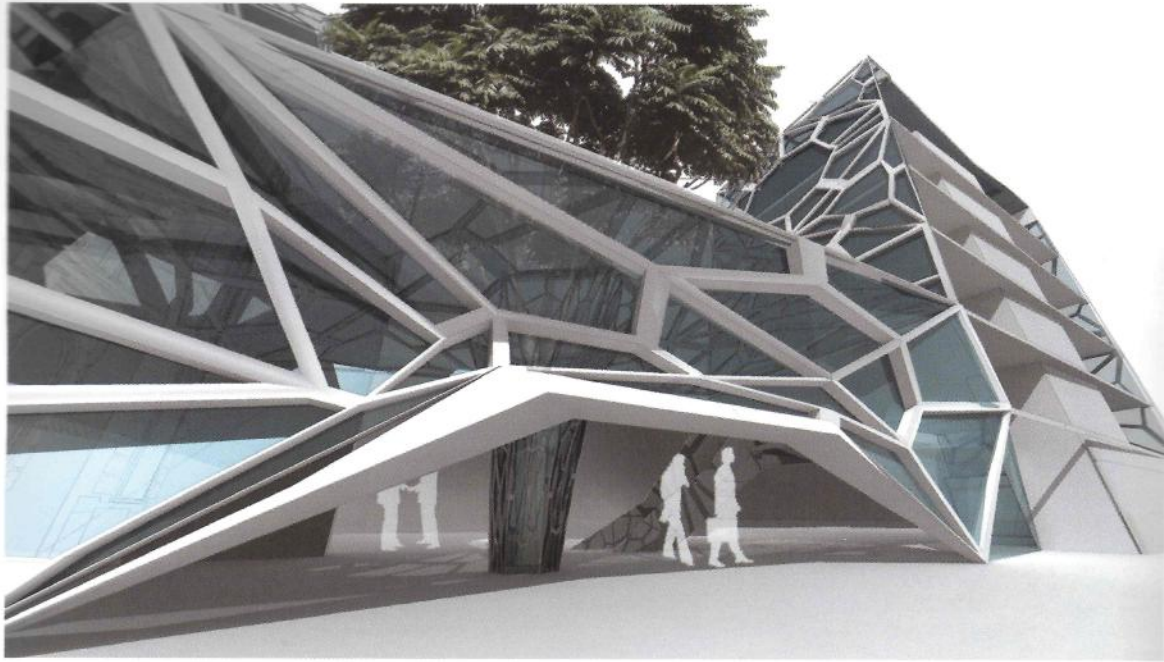
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Brussels Townhouse, Brussels, 2007–2008

Smart Skin – the townhouse has a structural glass skin with a pattern created by subdivision surfaces. This glass layer folds over a new commercial space in the (green) courtyard and consequently wraps up and over the new building, which incorporates a new commercial space of six floors. The suppleness of the skin becomes the binding element to connect existing and new spaces.

Archi-Tectonics

MEANING-FORM: A PERFORMATIVE ARCHITECTURE / WINKA DUBBELDAM

The first real challenge lies in the statement and creation of problems (the right problems), the second challenge lies in the discovery of genuine differences in kind; the third, [in] the apprehension of real time.

(Gilles Deleuze)¹

MEANING-FORM

THE UNDERSTANDING OF architecture as “meaning-form” departs from the tradition of architecture as style into a new concept of architecture as process. While architecture has often expressed a formalistic, mechanistic way of thinking, we at Archi-Tectonics are interested in a more organismic approach that emphasizes dynamic system-building. Major technological developments in the past century have instigated extreme cultural shifts. While new forms of transportation and media dramatically changed our general worldview, the introduction of digital generative design in the early 1990s opened new possibilities specifically in the development of three-dimensional form. We further evolved these potentialities through performance-driven design, which learns from the behavior of organisms. An organism is described as a total hierarchical assemblage of systems. A super organism refers to a unit of many individual organisms working together as a single functioning body. Therefore the basis of the organismic paradigm is the notion that an organism is characterized by its immanent patterns of organization. These organizing phenomena occur on all levels: not only in nature, but also in social and political systems. Ultimately this notion is reflected in the spaces we create.

BE CURIOUS

THE NOTION OF the “right” problem as discussed by Gilles Deleuze prioritizes concept-development over problem-solving, curiosity over absolute knowledge, and immediacy over stasis. This investigative approach has been the red line through the research and design conducted over the last decade at Archi-Tectonics. The work can be described as an open network, a network of projects linked through three fields of investigation: interface (urban data), surface (smart skin), and armature (smart space). These fields are not isolated, but rather create a synthesis of interests that overlap and inform each other and afford a rethinking, re-investigating, and regenerating of architectural concepts. The focus is not on form but on the performative, not on aesthetics but on intelligence. Helene Furján further elucidates in her essay, “Inside the Matrix: The Work of Archi-Tectonics”.²

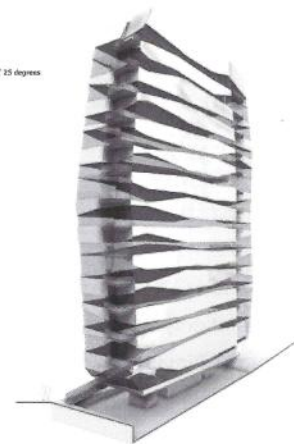
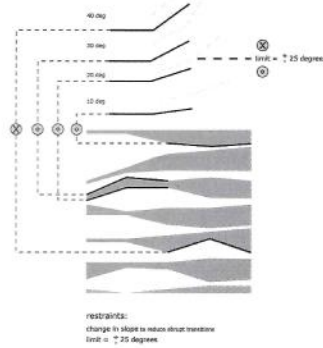
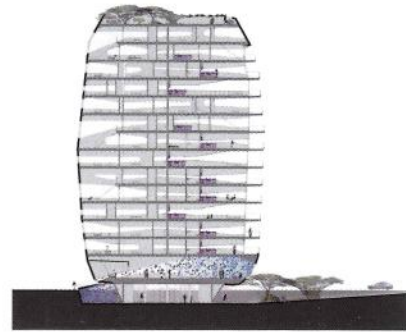
The work of Archi-Tectonics is generated through the deployment of three different typologies of matrix: armature, smart skin, and interface. Each of these organizers operates as a mechanism for “associative parametrics”: the feedbacks that link component assemblies in responsive feedbacks, and that link built organizations – bundled component assemblies – and their context or environment.



Q Tower, Philadelphia, 2008, mixed-use building

The Q Tower is a 24-unit tower, which has been developed as a "smart" tower, with integrated systems reactive to its inhabitants.

The collaboration with the MIT Media Lab is aimed toward developing the tower as a "learning" structure. Furthermore, each unit is designed to be different; algorithmic rule sets allocate room type and variation based on programmatic relationships, transparency percentage, and change in transition angles. The FTF (file-to-factory) method was used so that computer-driven equipment manufactures components directly from the parametric software.



FORM-FORMATION

ARCHITECTURE BY NATURE is a slowly evolving profession. Mathematics, already by the mid-nineteenth century, understood that absolute values are relative to the "phase state" of the object, as developed in topological deformations and higher-dimensional studies. Mathematical philosophy describes this process as "meaning-form." Edmund Husserl contrasted abstract, ideal geometries or "phoronomic shapes" with shapes derived from the surrounding world, "formations developed out of praxis and thought of in terms of [gradual] perfection."³ Yet phoronomic shapes are generative in character (phoron: a combining form meaning bearer, producer), and particularly interesting because they generate meaning-form. *Archi-Tectonics* used this concept originally to develop smart skins, which integrate various functionalities within. We then developed armatures, seemingly complex organic formations that are both formed by and reintegrate these functionalities. As an organic formation the armature criticizes the traditional hierarchical use of space, and instead transforms and guides it in a series of fluid zones.

Over the past ten years our research has focused on re-thinking, re-searching and re-evaluating the generation of these per-formative models. This refers to performance in the traditional sense – maintenance-free skins, low energy use and "green" structures – but even more to the creation of generative environments, where the boundary is blurred between industrial design intelligence and built form. *Archi-Tectonics'* systematic approach is described by Furján as "a need for optimizable solutions, intelligent relations between components, responsive adaptations of component assemblies to environmental or functional variation, and the development of new modes of fabrication and assembly as they are all demanded by the convergences of design and engineering disciplines in the wake of advanced digitization."⁴

FINALLY

AS ARCHI-TECTONICS WORKS through a series of design-research processes, we continue to hone in on the Deleuzian "right problem," allowing the narrative of the larger concept to inform the development of individual parts. Deleuze introduces the notion of Perplication, a state of Problem-Ideas in which the idea is the first principle of the theory of problems. The state of Problem-Ideas, "with their multiplicities and coexistent varieties, their determination of elements, their distribution of mobile singularities, and their formation of ideal series around these singularities," is not unlike the notion of "meaning-form" as discussed by Edmund Husserl.⁵ These notions have informed and inspired our design-research as it evolved, and helped us develop innovative spatial constructs and organic modulations which exhibit intelligence, integrate performance, and anticipate spontaneous interaction.

Notes

- 1 Gilles Deleuze, *Bergsonism*, New York: Zone, 1991.
- 2 Helene Furján, "Inside the Matrix: The Work of *Archi-Tectonics*," in Yasha Grobman and Eran Neuman (eds.) *Performatism*, (Tel Aviv Museum of Art Catalogue), Tel Aviv: A.R. Printing, 2008.
- 3 Edmund Husserl, "Appendix VI: The Origin of Geometry," in *The Crisis of European Sciences and Transcendental Phenomenology: An Introduction to Phenomenological Philosophy*, David Carr (trs.), Evanston, IL: Northwestern University, 1970, 376.
- 4 Furján, *ibid.*
- 5 Gilles Deleuze, *Difference and Repetition*, Paul Patton (trs.), New York: Columbia University Press, 1994, 351.



GW497 Project, Soho, New York, 2000–2004

The GW497 Project, Soho, New York City, uses code as a self-generative system. The building code is here re-interpreted; the vertical plane of the traditional façade is intersected by a diagonal surface, creating folds, balconies and set-backs. The angled façade's performance analysis resulted in the differentiation between the façade's intelligent components; the glass panels are bent in Barcelona and the custom-angled mullions are extruded in Hong Kong.



Inflection 2

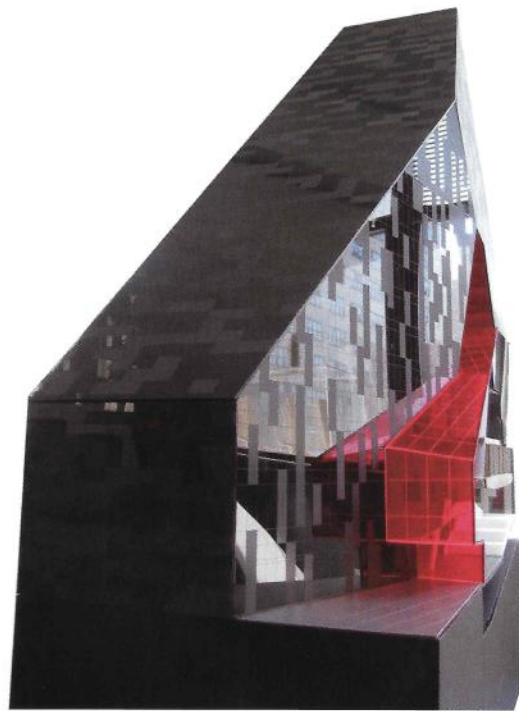


Setback variation



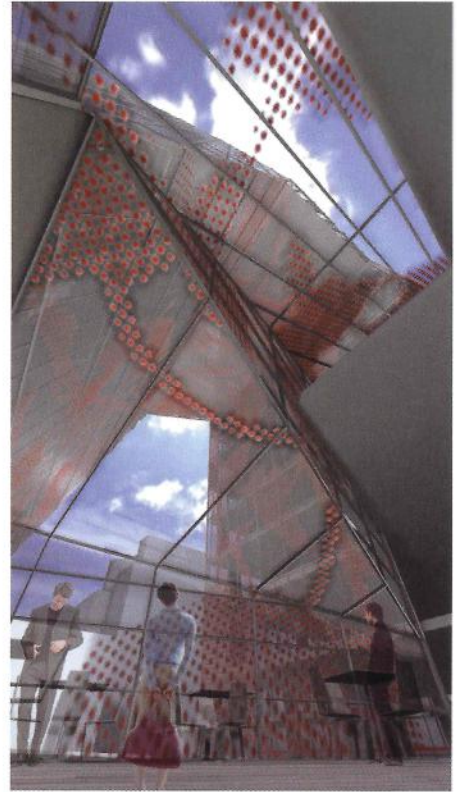
Sky exposure plan





Chestnut Hotel and Condominium Tower, Philadelphia, 2007

The knot tower is a literal meeting and intersecting of several programs and spatial environments; a six-star hotel, condominiums with hotel service, restaurant and spa. Its "unwinding" shape creates an open area in the middle, a place to relax from the hectic life, with a terrace where one is surrounded by etched crystalline glass surfaces with the shimmering of the pools below. The façades of the "knotted" structure are composed of a pixellation of glass and stone, similar in color, but different in texture and opacity.





Envelope and structure concept

Smart Ecology: Shopping Brussels, Brussels, Belgium, 2009

The project consists of ten pavilions in a new park located on a tunnel under Avenue Louise in Brussels. The integration between the built structures and the park is based on a piece of music specially composed for the site. The pavilions, which function as greenhouses and shopping spaces, are self-sustainable, using solar collectors for energy and collected rainwater for the plants both inside and out. The structural skin of the building is a continuous concrete membrane, which incorporates all heating and cooling systems.