

Parametric Intuition: form_deform_reform_transform_superform_inform

(New studio methodologies and the production of digital form)

by George Katodrytis

Process vs. fabrication

“**P**arametric intuition” as a design process is an oxymoron. It assumes both subjective and automatic practices. On one hand, digital generative processes are opening up new territories for conceptual, formal and tectonic exploration, and articulating an architectural topology and morphology. On the other hand, the technologies of digital fabrication are radically reconfiguring the relationship between conception and production, creating a direct link between what can be conceived and what can be constructed. But there is a danger. Any digital process should be an outcome of a design-biased methodology.

One approach to the architectural design studio is the introduction of the basic methods and concepts of generative morphologies through the making of physical models. This design approach to the studio is somehow primitive. We start with intuitive notions of basic observations based on actions and forces. The process is such that unique moments of a process are identified and developed. These experiential approaches lead to ideas that are not yet concepts of spaces or buildings. Rough physical models, devices, machines and apparatuses are then constructed. These are rough and experimental. These are developed into more refined fabrications and spatial physical models. At this stage, there is no site to contextualize, nor a program to resolve. The process is intuitive and based on search than competition. The modeling process is then switched to digital.

Digital media are only a tool. As such the initial impact of the digital technology has been a complete shift in the design approach that takes human perception

to a new level, notably that of repetition. The predecessor to the modern computer, Charles Babbage’s Difference Engine, was derived from the Jacquard Loom, a machine for automating the repetitive task of weaving. As a device for repetition, the logic of repetitiveness has become highly refined in the field of computing.

Digital defamiliarization

The primary role of computer-aided design in architecture and architectural education is one of invention followed by fabrication. One can unleash within a digital environment a population of virtual intuitive and formal explorations. This medium may prove to be the most valuable instrument in pedagogy. In a fabricated landscape where form follows simulation, the modeling machine becomes an instrument of intro-jection and reflection, placing itself both inside and outside in a world of speed and endless variations. The emphasis of the exploration is on morphological complexity. The new tools of topological procedures allow operations such as stretching without tearing, and folding without gluing, preserving only a set of very abstract properties invariant. According to Benjamin, the aesthetic experience consisted of keeping defamiliarization alive, as contrasted to its opposite - familiarization and security. This, taken into the studio design process, turns into a fascinating endeavor, as the outcome is not visible form the outset.

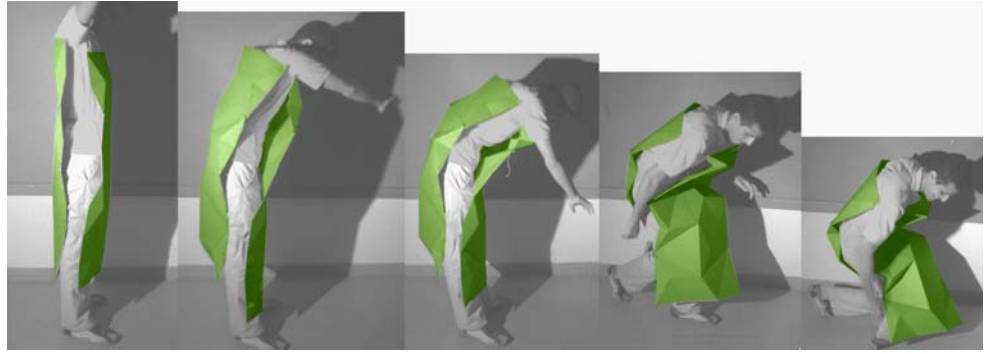
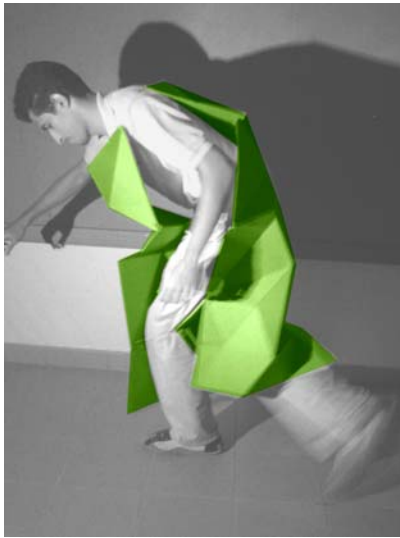
The Russian critic and writer Shklovsky describes “defamiliarization” as “*stumble[ing] onto a poetic something that was never meant, originally to serve as an object of aesthetic contemplation*”. Shklovsky developed the concept of *ostranenie* or defamiliarization in

literature. He explained this idea as follows: “*The purpose of art is to impart the sensation of things as they are perceived and not as they are known. The technique of art is to make objects ‘unfamiliar’, to make forms difficult, to increase the difficulty and length of perception because the process of perception is an aesthetic end in itself and must be prolonged. Art is a way of experiencing the artfulness of an object; the object is not important.*” (Shklovsky, “Art as Technique”)

Architecture, like philosophy (and for that matter, biology and physics), is perpetually verging on and irresistibly drawn to its own virtualities, to ever-increasing loops of uncertainty and immanence that its own practices engage and produce. The future of each discipline requires that each open itself up to reconsideration of the virtual, and the promise for newness, otherness and divergence from what currently prevails.

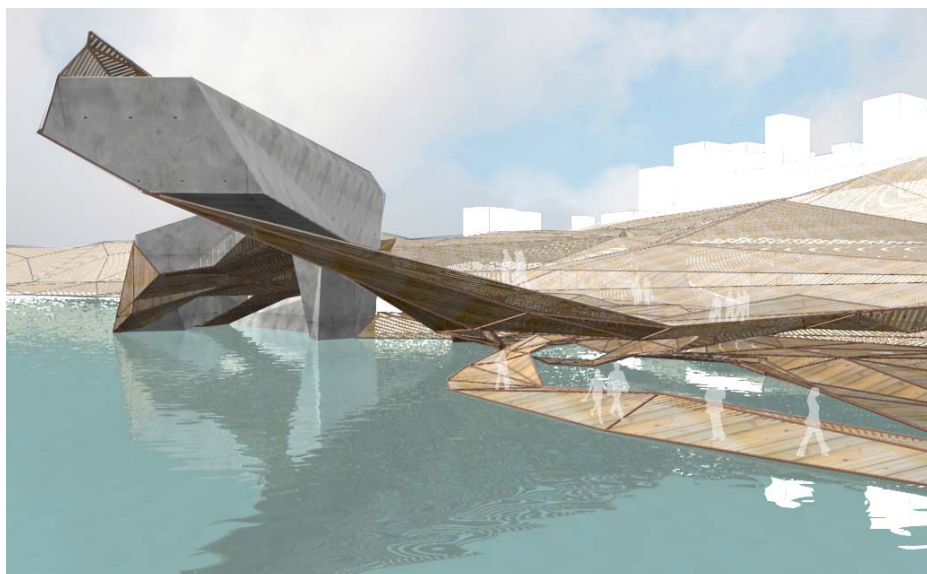
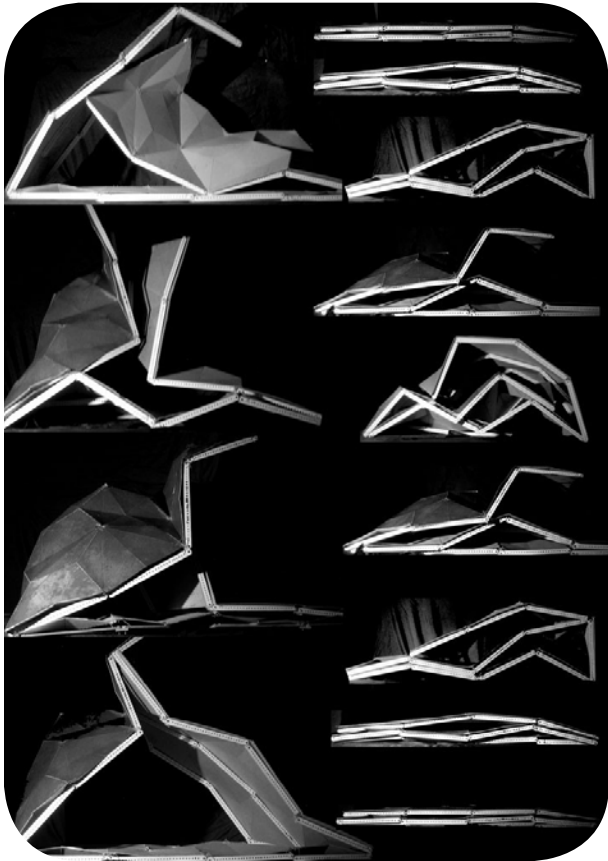
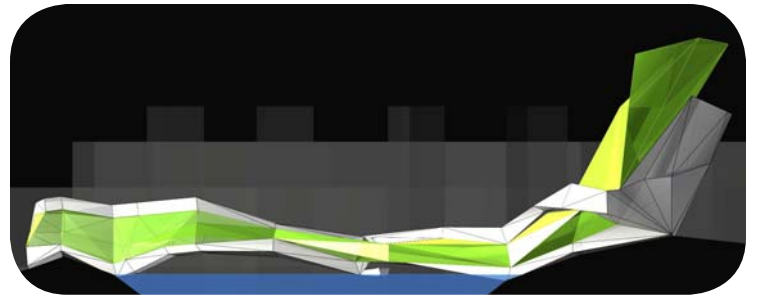
Digital invention

Instead of denying complexity, lack of control and contradiction, one may embrace these conditions and declare them as the starting point for projects. Utilizing the dynamics of transitional and evolutionary space, a studio program may develop new ideas and techniques for architectural proposals with design systems based on procedure and recursion, in order to index relationships between material systems, programmatic organizations and, ultimately, new formal languages. These design systems are tested through physical and digital models for their capacity to generate effective architectural responses. Students visualize architecture as an amalgam that sustains evolving transformations through multiple, diverse, and often conflicting and unpredictable forces. The



Barrak Al-Babtain:
Trans_form_ative urban_ism

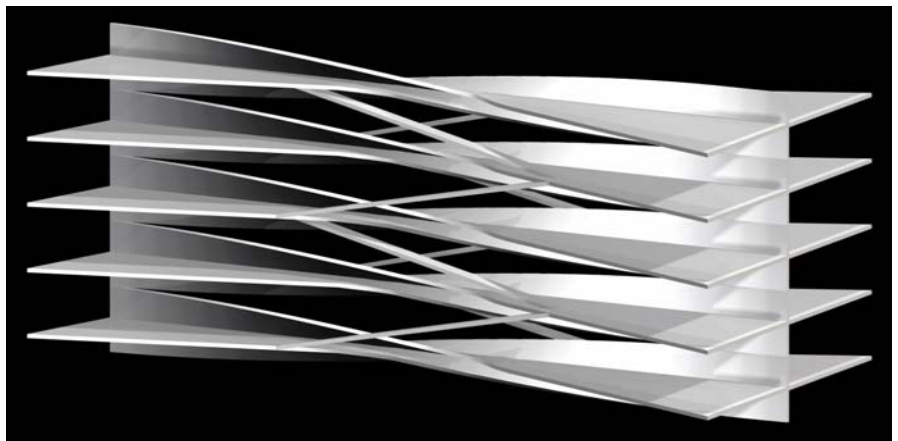
Early experiments of body prosthetics as an abstract machine leading to the generation of form through digital mapping. Proposal for an artificial beach, with a hotel and customs at Dubai's creek/waterfront, UAE.



design process begins with the hypothesis that, in order to liberate architecture from functional preoccupations, one should relinquish the notion of function as a base-data from which design briefs and projects should originate. It develops performative morphologies that may alter the environment and, in doing so, suggest alternative forms of habitation. Liberated from the obligation to communicate meaning, architecture is free to give full expression to its creative potential. Fostered by an unapologetic fascination with formal language, the research aims to develop a cohesive and justifiable contemporary architectural language. The focus of this studio is twofold: the study of a particular notion of syntactic and morphological language (typology), and the investigation of geometric configurations (topology).

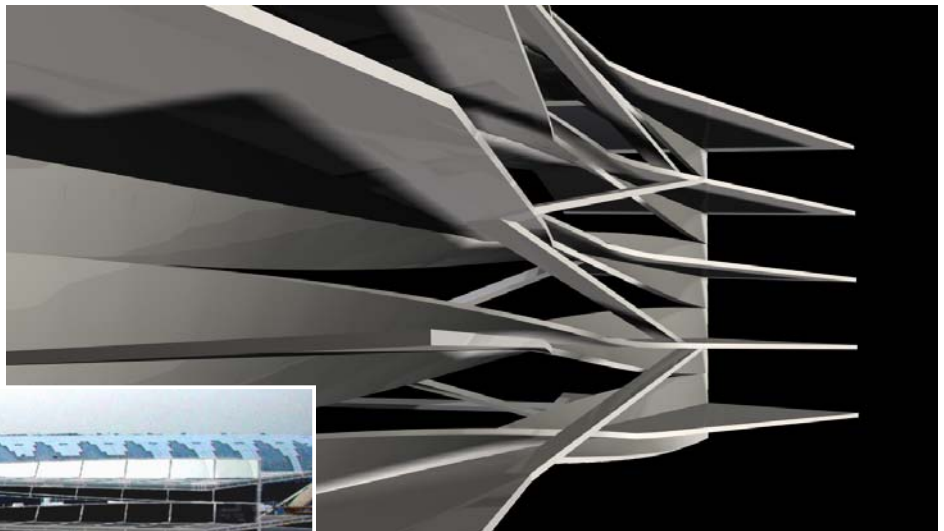
Digital Transformation

Transformation is central to the process of design. To start with, one approach to design in the digital architecture studio can be paradoxically primitive. This studio introduces the basic methods and concepts of generative morphologies through the making of physical models. The experiments in morphogenesis are based on an abstract formal system that is autonomous and deterministic



Hend Al-Matrouk:
Trans_form_ative urban_ism

Rotating planes creating continuous loops of corridors for facilitating movement for an airport terminal building: incoming, outgoing and in transit passengers. Dubai Airport, UAE



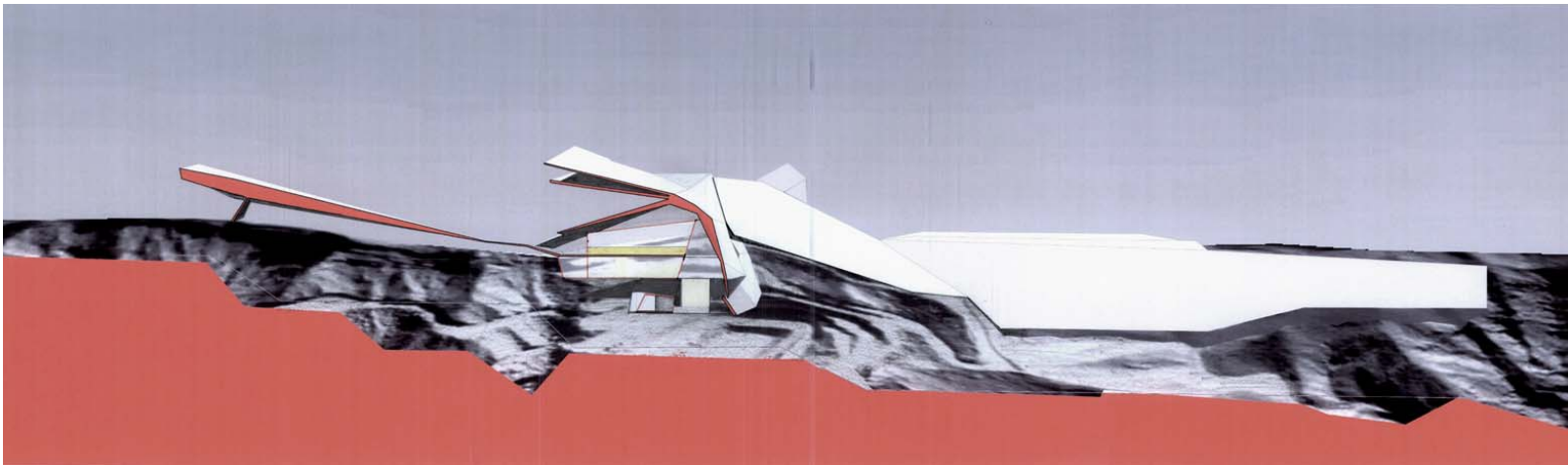
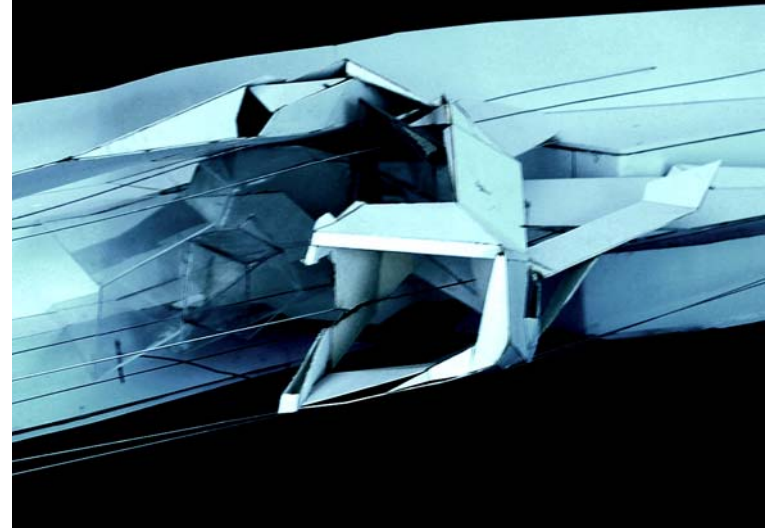
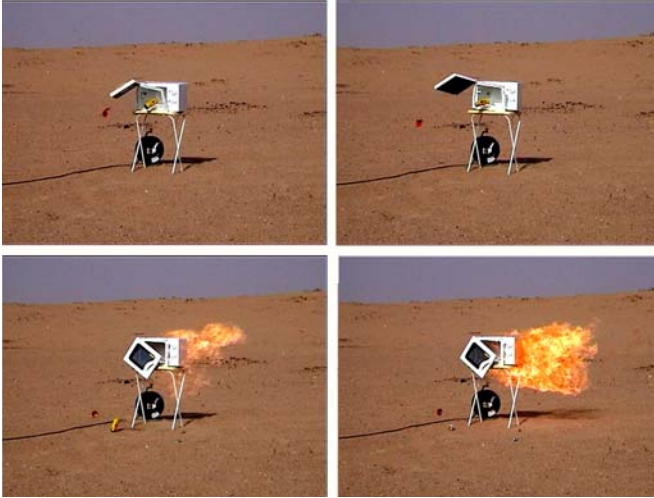
once the rules are set and defined. It has the capacity and tendency to be transformed. To this extent, architecture is about transformation and exploration. Recent developments in digital methods have emphasized the exploration for morphological complexity. The construction and selection of rules that

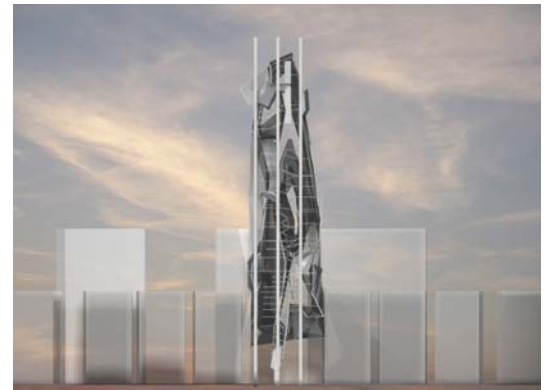
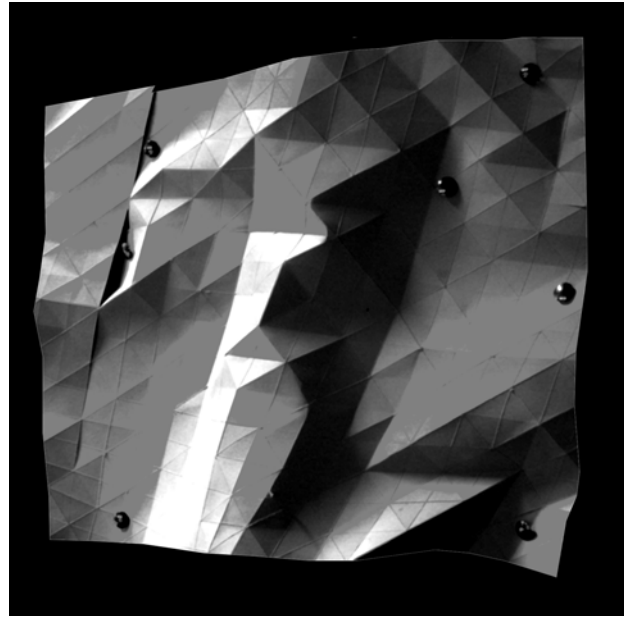
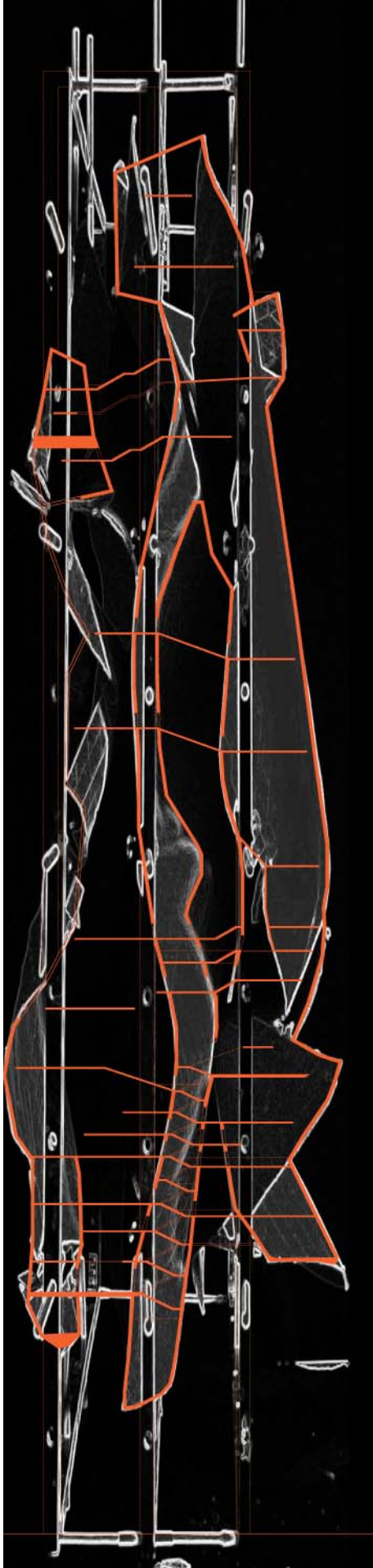
produce specific effects is motivated by aesthetic and plastic sensibilities. For the first time, architecture is genuinely searching for complexity of this formal type, in order to keep in touch with that of the city of the networks and systems, with the intricacy of culture and the vagueness of globalization.

This abstract machine therefore calls into question traditional methods of architectural design and proposes a design process in which the architect becomes an inventor or constructor of formal systems. At the same time, it takes on the role of a navigator of the system's behavior over time.

Basel Shuhaiber: Trans_orm_ativ_e urban_ism

Abrupt transformations on the desert and the development of a kinetic enclosure to facilitate take off for a gliding school, Sharjah, UAE.





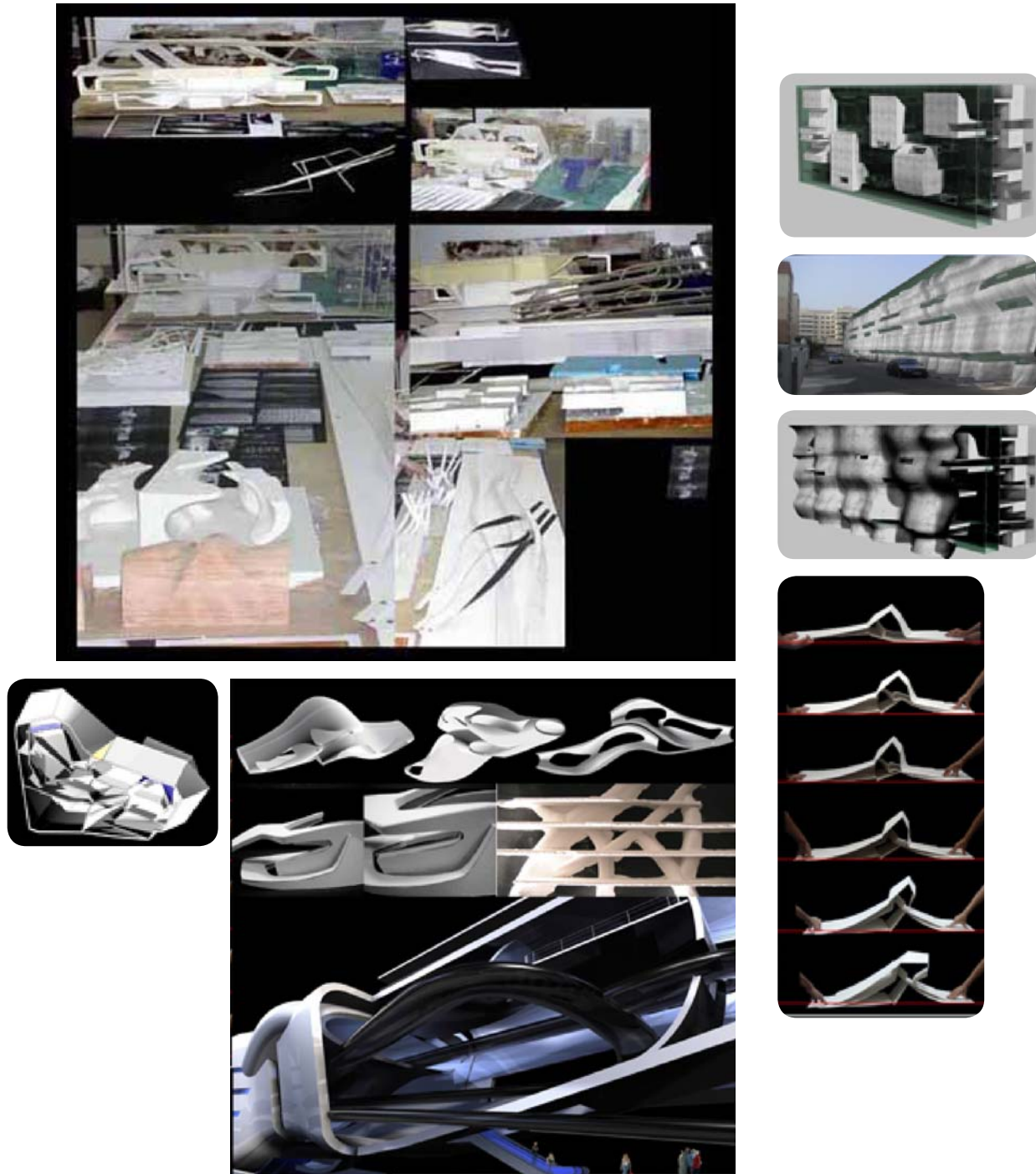
Tarik Nour:
Trans_form_ative urban_ism

A devise for surface tessellation and adaptation develops into a vertical, flexible and rentable space thus commenting on Dubai's current inflexible office high-rise design, UAE.



Collage

Collage of various studio projects demonstrating the transformation of physical to digital modeling.



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