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Ordering Complexity

Patrik Schumacher

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A conversation with Patrik Schumacher of Zaha Hadid Architects

How do you think digital technology is changing the spatial experience in architecture?

Schumacher: Digital technology is indirectly changing the spatial experience in architecture by allowing us to increase the complexity of our designs through the creation of interpenetrating geometries and spaces. Now, we are able to host more complex geometries while using familiar technologies. We are simulating, form finding and developing new morphologies, which result in new technologically augmented spaces. In responsive and intelligent environments, we have found that sensors and response mechanisms go through a number of reconfigurations in terms of lighting and screening to make experiences more interactive. These new avenues in design become super imposed consequences of using digital technologies during the design, simulation and fabrication process.

How are augmented tools helping you with design technology that aids in the design process?

Schumacher: Everything is system-based and rule-based, if you like. At least in our research groups and design studios it is. Presently, we are developing a repertoire of work to support this idea. That repertoire is a computational process script based form generation. This allows us to embed computational processes into agent-based models. We can embed intelligence and constraints with

concern to the environment, structure, program and occupation. This harnesses our design-generative capacity and enhances our understanding of built rule-based mechanisms that gather information.

This does make multi-parameter factoring challenging. It would be difficult to intuitively translate the iterative design process with a series of feedback loops, with a generative mode and a structural analysis mode that runs feedback from the next iteration or directly from data sets.

Now, we script on top of data sets and generate further geometries. This is the way we are using parametricism ecologically, by integrating environmental adaptability.

We place and congenially set up to take measure where we establish a direct parameter, for instance, on an envelope in terms of sun exposure distribution. We then use the collected data sets for the next design, taking into account the distribution of elements and openings.

In this ecological paradigm, we are also working with fluid dynamic modeling in an effort to capture the impact of wind for cooling and ventilation purposes. Through the use of dynamic modeling, the virtual model becomes more and more realistic, allowing us to observe how it might actually respond prior to being built. This expands our understanding of the repertoire and invites a new aesthetic sensibility to a project.
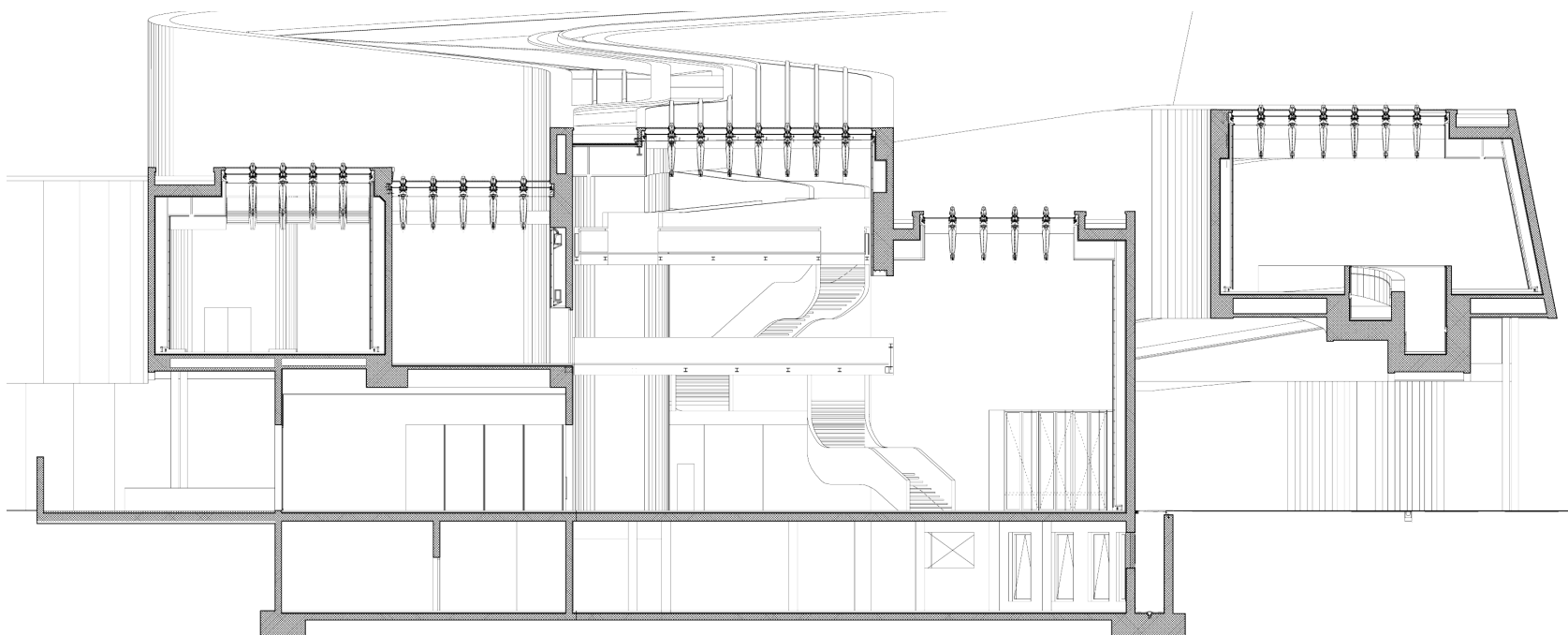
This found sensibility is about complex organic orders that are law-based and rule-based, where each system is internally differentiated according to a rule and parameter, but then from system-to-system, there are resonances and correlations.

In the parametric model, all things are connected. The skeleton and the structure are interconnected with the envelope. Changes to the envelope affect the skeleton and vice versa.

The occupiable surface is, of course, looked at as a subsystem that has to respond, or can respond, to different environmental inputs. This is the idea that supports the building of a complex, layered multisystem design where the systems are sensitive to each other and to environmental factors.

Parametric modeling creates elegantly correlated systems with a sense of legible order. As sentient beings, we are intuitively sensitive to correlations and lawful dependencies. This is how we navigate our environments. I think we are correlation-seeking creatures who naturally navigate environments that have a degree of lawfulness similar to those of natural environments. This understanding can change the community's perception of architecture, if we develop these projects coherently on a larger scale.

We are doing a number of urban projects now where we want to have a deep rationale for environmental orientation, with regard to wind direction and the way a program is distributed and settled into a differentiated field. These considerations are lawful and if we design with sensitivity to this lawfulness, people will come to trust their environments again.

People need to navigate and be connected; interconnectivity between spaces and events is crucial. You move from one to another quickly, orienting quickly, always with the potential to participate in another space or event. This is what parametricism is conducive to designing for, and supporting, this increased range.

It offers a new way of handling functions and form in terms of subsystems.

This is the new state-of-the-art way of approaching a design problem and working it though. It will become the standard of the twenty-first century.

How do you view parametricism altering and enhancing the architecture profession and the community perception of architecture?

Schumacher: We have been an experimental avant-garde firm practicing research, but additionally, a number of our projects have demonstrated that we are writing more than manifestos to advance the discipline, we are designing compelling high performance projects.

We enhance life in the places where we have contributed. For example,

the MAXXI museum, beyond the built product, has become an interesting experience for audiences. It is a very complex network of spatial sequences. It provides a new way of experiencing the public space, the relationship between inside outside and the concatenation of continually morphing gallery spaces that feed one into the other. One is able to perceive character and difference within a unity of the overall system.

If you have the opportunity to experience the space, you will find that at many points, there is provided a multiplicity of vistas as a deep penetration and layering of space.

These vistas share glimpses and offerings for the next move in each direction. You can look down, up, all around, out from the building to the outdoor and then back into the indoor—the space, which we created, was made porous and sponge-like. It offers a sequence of experiential events to follow and participate in, as part of the building's larger art exhibition.

We observed it under multiple conditions; it is adaptable for a variety of functions. For example, in a concert hall, you would have to select between multiple closed or open forums and exhibitions, but the kind of deep Piranesi style space, which used to be an image of vertigo and power, in the MAXXI, now becomes an image of energizing, lustful participation with option for multiple events.

There are more communicative opportunities in today's condition than there were 30 or 40 years ago. That is what this architecture is trying to express in its building and urban space, while simultaneously preventing disintegration into some kind of threatening visual chaos. Architecture is a skill, art and systematic process of working through new forms of ordering interpenetrating spaces and events so that there is an elegance that comes out of solving the problem, of ordering, structuring, and making legible a vast new level of complexity. In life's social forces, the hope is that in an ordered space, you won't feel drowned or threatened but empowered, guided and oriented to cope with and approach this kind of urban scheme.

We all have to learn to watch soap operas with five parallels of activity, intercepted by commercials, which only allow a split second to gather the connotations which make up the fiber information—the same way we have learned and continue to learn to inhabit our dense, rich urban environments. We promote this sensibility architecturally because we expect an audience to become naturally drawn to these kinds of spaces, to slowly reject minimalist spaces, which try to bleach out variety and complexity for monumental emptiness that is supposed to be calming. It is dysfunctional, however, to allow your sensibilities to be drawn in this direction. In those spaces, you cannot participate and become the high

performance, quick communicator that you should be.

As we design complex, mixed-use urban quarters, parametricism shows its true superiority over modernism and minimalism in its ability to integrate functional space.

Do you think that over stimulation, designer's reactions, or society's demand has caused this new style?

Schumacher: Society is definitely demanding it, as demonstrated by the, what I call, "crisis of modernism." Any discipline or profession, in my terms, functions as a proof of society. As long as the principles keep working, it has its own inertia to keep refining what it does. But there came, in the late-60s, early-70s, a time when the economic crisis made apparent that society had changed to some extent on the basis of material achievements and the meaning of mass production that delivered a uniform general consumption standard.

We were interested in innovation, rather than making the same goods at a cheaper price. This shift in society caused a change, where at a certain moment, these industrial satellite cities with monotonous sleeping silos and greenfield offices became segregated.

At this time, a new and different shift was required to develop the next stage of civilization and this came into contradiction with this new kind of architecture, the kind of architecture involving zoned cities with three sectors, each filled with repetitive modules. Life abandoned this modernist architecture and clients abandoned these recipes.

Then, something new and vital developed; the old historic centers, which had been emptying out, became new creative hubs. That brought postmodernism on as the first architectural reaction and de-constructivism as the second, integrating and abstracting these principles of variety and complexity.

Architecture was asked to speak; it was asked to bring things together. We became tolerant of intersecting and clashing aesthetics. Collage aesthetics suddenly represented a new vitality that figures like Coop Himmelblau practiced and explored. This, we learned to love.

In the meantime, you have retroactive manifestos like Koolhaas' *Bigness Alone*, exploring the culture of congestion in New York, or Venturi's *Learning from Las Vegas*, discussing symbiotic intensification of environments. Out of these challenges, there is an aspect of society driving somewhere else, abandoning recipes and developing ad-hoc semi-solutions.

Inevitably, this is noticeable in architecture. Architecture develops out of its own intellectual resources and discourse, but it has to adapt to fit into an overall societal process, otherwise it is irrelevant and doomed, just as modernism was. There are new ways of working now, which incorporate these charges in a systematic way, not an ad hoc way, not in a following-life sort of way, but a now-leading-the-way. I would argue that parametricism has learned the lesson of Postmodernism and Deconstructivism. We have had our ten years of experimentation, learning those lessons and adding further refinements and repertoires, which, I think, are tuned and congenial to what I call the life forces of post-Fordist network society.

How did the Italian population receive the MAXXI museum? How did you deal with the bureaucracy of building a new large-scale project in Rome?

Schumacher: I think that this project suffered initially in that it was right in a historical vault. This made its acceptance a bit tougher. The MAXXI museum is a nineteenth century city development project. Close to the site, there were already examples of contemporary and modern architecture intercepting an urban fabric, in the work of Pier Luigi Nervi and Renzo Piano. So, new architecture already existed there. I think we won the competition because our project sits elegantly within the complex urban structure. The site and program were difficult. This allowed us to show an adaptive capacity and malleability in terms of the language that we

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developed. It was a task which minimalist design could not have solved. A minimalist box would have felt clumsy and blunt. The malleability of our open system, using curvature to mediate urban direction, by swinging around the L-shaped site, tied things together. In terms of the media and public response, the opening and reception were very successful.

Your firm has a vast portfolio of built and un-built work. Do you conceive that artifacts of the design process, such as drawings and models, can be architecture, or are they merely tools to enhance a design if it is to be constructed?

Schumacher: I will make a distinction between internal discourse of the discipline and the discourse amongst designers and experts. Initially, you have sketch renderings, drawings, models, and model photographs circulating, not only within the firm but also in exhibitions, web posts, and books. In this sense, all media are presented equally. Even with the real building, fully rendered images are important because they develop the repertoire, concepts and categories with which we guide our work.

Ultimately, all methods of exploring aesthetic sensibilities are important to apply equally in built works and the interim communications. They all operate in the medium of space in one way or another. For instance, in a documentation discourse, I can refer to a built work like the MAXXI, or I can refer to a published sketch. They
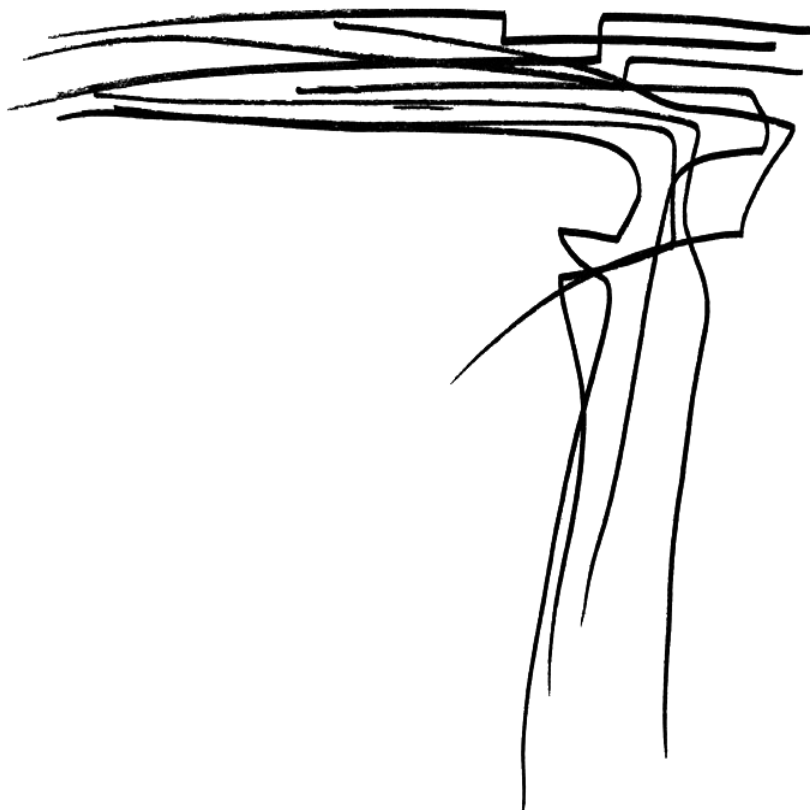
are equal with respect to the internal discourse. Obviously, though, the final work has its own separate life; it is the final communication, which architects deliver to society, wherein we are truly able to see its affects on life processes. However, in the end, of course, for society, only the built works matter.

Where do you think pen and paper find their way into the design process?

Schumacher: Some of the language of architecture, which relies so much on the computer now, is initialized through hand sketches where rapid hand movement is the physical function or law of a line's progression. Things are computationally generated, modeled, rendered and yet we keep interfacing and intersecting these with sketches in order to initiate loose trajectories. I recognize, though, that work now has advanced to a level where one can no longer fulfill the needs of a project just by hand drawing. The role of hand drawing and sketching has changed; it has become a kind of subsidiary and dependent condition. I've written a book entitled *Digital Hadid* where we talk about creating this desire for multilayered phenomena through gradients and fading effects that can be achieved so flawlessly with digital media. Ultimately, our architecture has to mature into the digital, parametric model. Notably, we have gone quite far with pre-digital hand sketches. French curves do allow for precision but the product and the level of sophistication that one can reach with those tools, compared to what we are doing now, is limited. Productivity, in terms of how many projects you can achieve this way, is limited as well. Of course, the hand sketch will never be superseded because it is how we interact and interface with the digital process. Drawing by hand is a different subsidiary, dependent technique now. It was once the sole technique, carrying full burden, for delivering a project, and now, it is not.

Do you have any concluding statements?

Schumacher: For more information about the ideas I have discussed here, please reference my newly published text *The Autopoiesis of Architecture; Vol. 1 A New Framework for Architecture.*

MAXXI Museum Project Credits

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