On Parametricism - A Dialogue between Neil Leach and Patrik Schumacher
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Abstract: In this interview Patrik Schumacher defends Parametricism as the global style for the 21st Century, conceived in the great lineage of epochal styles like Renaissance, Baroque and Modernism. It is defined and argued for on the basis of its results rather than in terms of its adopted techniques. The renewed concept of style is defended as factor in the formation and promotion of the global movement of Parametricism. The task is posed of advancing Parametricism from avant-garde hegemony to mainstream hegemony. To achieve this Parametricism is grounded in a general theory of architecture - the theory of architectural autopoiesis - which in turn is grounded in a general theory of society, namely Niklas Luhmann's social systems theory. This theory understands society as a system of communications. Accordingly all architectural design is communication design. Under the heading of 'parametric semiology' this conception can be operationalized via the integration of agent based crowd modeling into the design process.

Key words: *parametricism, epochal style, technique, design process, algorithmic design, relational logics, multi-agent systems, process fetishism, design heuristics, dogma, taboo, social interaction patterns, Postmodernity, Late Capitalism, political activism, avant-garde, mainstream, Gilles Deleuze, Niklas Luhmann, communication theory, parametric semiology*

1. You have coined the term, 'parametricism', to refer to what you call the new global style of architecture and urbanism. On the one hand, I have to admire the fact that you have come up with a term that does not use the prefixes, 'Neo', New' or 'Post', a logic that many labels – somewhat apologetically in my view – have succumbed to. But on the other hand, I find the term 'parametricism' deeply problematic for a number of reasons:

a. It takes a computational technique and relates it to an aesthetic.
b. It fails to distinguish between algorithmic techniques (Grasshopper, Processing, Rhino scripting, MEL scripting, Generative Components etc.) and parametric techniques (Catia, Digital Project).
c. It fails to distinguish between parametric/algorithmic techniques and explicit modeling techniques and also all precomputational form making in offices such as ZHA, Gehry and Partners etc.
In hindsight, might you have adopted a different term? Many people have misgivings about the term 'parametric', in that all design has always been 'parametric' in that we always adjust parameters, and they have suggested 'associative' design (as used by Peter Trummer) as a more appropriate term. Certainly few people in the West working at the forefront of computation use the term 'parametric' or 'parametricism', although it is still popular in China for some reason.

P.Sch.:
More important than the choice of term which remains up for debate – although it stuck already to some extent (including Wikipedia entry) - is the recognition that there has emerged a strong, sustained avant-garde movement that is growing globally and that is maturing by both broadening its scope and deepening its expertise via cumulative, collective research. This movement has captured the imagination and energy of the best part of the current generation of young architects. There is no other original, promising game in town. This movement deserves an encompassing name that gathers and promotes these convergent forces and sets them apart from competing approaches. To call this movement a style, and to further call this style the only serious candidate for becoming the epochal style of the 21st century, is raising the stakes considerably. I am challenging our movement, to challenge ourselves by seeing ourselves in the great lineage of epochal styles: Gothic, Renaissance, Baroque, Historicism, Modernism. These styles are the great cycles of innovation, the stages by which our

discipline advanced across the centuries to innovate and adaptively upgrade the built environment in line with the general advances of human civilization. The collective research that has advanced under the auspices of the new paradigm of parametricism has reached a point where global mainstream impact should be finally put on the agenda, after 30 years of searching for a new way forward, after the crisis of modernism had forced the discipline into a cycle of radical rethinking.

I think the emphasis on the unity of basic principles – in radical demarcation to all prior styles of architecture – is more important now than distinctions based on different techniques within the movement. For major internal distinctions I have reserved the concept of subsidiary styles which I expect to flourish in the forthcoming period if they are not already discernible. (By the way I dispute that any prior style – Decon, Pomo, modernism or classicism was 'parametric' in any meaningful way. I also dispute that the term is losing currency).

So for me the emergence of a new epochal style, a new set of principles and values, in both formal and functional respects, is more important than methodological and procedural innovations via specific computational techniques. That's why I include works that share the principles and values of the new style even if the design processes were not yet computationally based. There is no doubt that radically new design tools and processes are at the heart of the movement. However, while the style and its further progress depends on the deployment and further evolution of computationally sophisticated techniques, it cannot be reduced to a matter of technique. That there are distinctions to be observed with respect to the range of new techniques and design methodologies is clear. However, these are matters of expediency rather than matters of ideological demarcation in the ensuing style wars. Again on the question of the name: I also considered 'Relationism' or 'Correlationism' due to the crucial importance of thinking and operating in terms of correlations/dependencies, i.e. associative logics. However, I felt that 'Parametricism' is more general and thus more powerful. It affords a definition in terms of architecture's fundamental building blocks: All architectural elements become parametrically malleable (and thus capable of relating and interacting with each other).

2. In my article, 'Parametrics Explained', I write: 'Surely what the world of computation promises is not merely a new style, but a radically new way of approaching design, where we embed new computational techniques into evolutionary and emergent systems, and where we breed systems and test them out in real time, so that the diagram becomes the reality and reality is the diagram. Form should be seen as largely irrelevant within this new horizon. Instead we should be focusing on more intelligent and logical design processes. Logic should be the new form.' In the light of your recent interest in aspects of algorithmic design – such as multi-agent systems - would you agree?

P.Sch.:

I agree to the extent that the most general operational definition of parametricism refers to relational logics (whether associative or agent based) rather than to specific formal features like e.g. curve-linearity. However, I must vehemently disagree with you that therefore "form should be seen as largely irrelevant". Neither form nor function can ever be irrelevant within architecture. Form versus function remains the lead distinction of the discipline and discourse of architecture, since architecture's inauguration in the Renaissance. Pitting logics against forms is like pitting processes against results. These are false dichotomies. In the end the process delivers forms: urban forms, architectural forms, tectonic forms. These forms promote social functions, i.e. they order, frame and facilitate social interaction. Multi-agent systems are being used to try to generate urban and architectural forms that are more intricate in their responsiveness to multiple, simultaneous constraints than can be achieved by intuitive modeling. The resultant architectural morphologies are intricate, complex spatial orders. The formal result aimed at is thus ordered complexity – a rather abstract, open ended definition. However, such formal results are themselves only means to an end. The final end is the facilitation of vital, ever more complex life-processes.

By the way, I have recently started to use multi-agent systems to simulate these life-processes, i.e. the occupation and social interaction patterns that might be expected or desired within the designed spaces. For the first time, it is possible to operationalize the designer's speculation about how specific spatial organisations and articulations order social scenarios. Agents' behavioral rules and biases are defined in relation to the designed spatial and architectural features. The emergent interaction pattern

then becomes the intentional focus for the designer's iterative calibrating adjustments of both spatial-architectural forms and agents' profiles. Architectural form remains what we are ultimately working on and defining, even if the final criterion of success is the productivity of the life processes that are unfolding within it, due to its ordering and framing contribution. The design process and the algorithmic logics that are utilized within it are means to an end. In the early stages of an avant-garde movement the new design process might very well be foregrounded in order to advance design capabilities. At this stage the process innovation might appear to be a value and end in itself. However, in the final analysis, the process must be subservient to the resultant form and intended function. The reversal of this means-ends hierarchy can only lead to process fetishism.

3. You use the term 'style' – somewhat controversially. I can understand that this is how the general public might understand architecture – from the outside, so to speak. But is this an appropriate term for architects and architectural theorists to use? It seems from your discourse that you are concerned about a particular approach to design – a series of operations , of techniques, of design strategies etc – which amount to a *process* of design. Of course, all processes have their 'effects'. In the end there is a form that is generated that must be recognized as a form of representation. But is not that representation merely the result or 'effect' of those processes? Or do you see the role of the effect as paramount, so that the purpose of design is merely to reverse engineer a process of generating form in order to achieve certain effects?

P.Sch.:
Yes, precisely, now you got the hierarchy the right way around. The effects are important. They are initially formal effects. However, in distinction to formalists like Jeffrey Kipnis, I think that these formal effects are only means to functional effects. By functional effects I mean the social ordering and framing effects of articulated architectural territories, i.e. the ordering of societal communication that allows the various, relevant participants in the multitude of specific communication situations of society to find each other, ordered into specific, relevant constellations.
Concerning the concept of style: It is indeed the only concept through which the general public registers architecture. Even on this count it would be a mistake to give up on the concept. I think the concept has also done great work within the internal discourse of architecture. Since its emergence at the beginning of the 19th century the concept has stimulated the discipline with the great question: *What should the style of our modern, industrial civilization look like*? This question inspired a searching debate which finally resulted in the decisive breakthrough of modernism. I believe the concept can inspire us now once more. To do this it needs to be reconstructed and cleansed of some of its connotations,i.e. that styles are like a fashions, or that they are superficial and only about appearances. I interpret avant-garde styles as design research programmes, in analogy to the great paradigms of science. In their mainstream phase styles provide best practice principles. If these principles are made explicit - as I have done for parametricism - they provide both formal and functional design heuristics (taboos and dogmas) that serve as principles of design critique (including self-critique) as well as clear guidance about how to progress and enhance the design further and further: Always query if you can give the basic components of your design more variability, more degrees of freedom, always invent/search for further rules of differentiation for your subsystems, always tighten further the correlations (interdependencies) within your design, both within the design as well as between the design and its context. In short: always vary, always differentiate, always correlate.

4. If, as Fredric Jameson would claim, what characterizes Postmodernity is the cooption of everything into signs and commodities, and that nothing escapes the homogenizing tendencies of the market place of Late Capitalism. In other words what gives Postmodernity is tenacity is that it generates resistance and alternative outlooks that it actually feeds off. As a result 'difference' or 'resistance' just become alternative positions within the marketplace of Postmodernity. So many forms of 'resistance' or 'overcoming' of Postmodernity are in fact symptoms of Postmodernity that in fact serve to feed Postmodernity. As such, far from

overcoming Postmodernity could 'Parametricism' actually be seen as a product of Postmodernity?

P.Sch.:
Parametricism is certainly a (late) response to the crisis of modernism; and the discourse of parametricism – our contemporary architectural discourse – has certainly picked up the theoretical agility and reflectiveness from postmodern (post-structuralist) philosophy. Parametricism is obviously radically new and anti-thetical relative to Postmodern archtrecture. However, there is also a (dialectical) lineage from Postmodern architecture, via Deconstructivism and Folding. By the way, I do not think that the logic of Late Capitalism is homogenizing. I rather think it is more differentiating, certainly in comparison with the previous era of Fordist mass production capitalism. This precisely motivates a decisive point of distinction between modernism and parametricism.

We should not expect parametricism or architecture in general to resist the (cultural or economic) logic of Late Capitalism. As I have posited in the 2nd Volume of my book 'The Autopoiesis of Architecture', I do not believe that architecture – even avant-garde architecture - should be construed as a form of political activism or resistance. Political debates and interventions take place in the political system of society, not within architecture. Architecture's task is to evolve its design resources and to innovatively adapt the built environment according to the progress of society. The political aspects of this progress are determined in the political system, the economic aspects in the economic system etc. The discipline of architecture has to adapt and upgrade its own specific responses and solutions, congenial to the advances achieved in the other societal function system (politics, economy, science etc.), rather than trying to second guess and substitute itself for these other function systems. In turn we can demand that politicians, business leaders and scientist abstain from telling us what the architecture of contemporary society should look like, as long as we deliver solutions to their concerns. The discipline of architecture needs to successfully address the challenges posed by society but it is autonomous in determining how best to succeed in addressing these challenges.

So, in its accommodating, adaptive, apolitical stance, parametricism is a child of Postmodernity. However, I also advocate a sharp turn away from another aspect of Postmodern culture, namely I advocate to radically break with the non-committal celebration of pluralism and the 'anything goes' relativism of Postmodernity. I consider the postmodern pluralism and relativism as a temporarily necessary anti-methodology that was productive after the crisis of modernism. The same goes for the philosophical relativism promoted by post-structuralism and deconstruction after the breakdown of positivism, positivist sociology and modernization theory. However, the discourse culture of Postmodernity can no longer count as a satisfactory intellectual climate today. After radical critique, irony and deconstruction a new phase of constructive elaboration, both theoretically and practically should be aimed for. With respect to a new, sophisticated theory of society that has learned the lessons and self-reflective loops of Postmodernity - including the awareness of its own inherent contingency - Niklas Luhmann has delivered a very impressive, coherent constructive effort. My theory of architectural autopoiesis is attempting to provide a similarly systematic theoretical edifice for the societal subsystem that calls itself architecture. This theory connects directly to Luhmann's overarching theoretical system.

5. You are interested in championing a new global style, but at the same time identify your position as being 'avant-garde'. Is it possible to reconcile these two positions? Or does any movement lose its avant-garde status once is becomes mainstream?

P.Sch.:
The movement as such loses its pure avant-garde status - in the sense that it is no longer confined to the avant-garde segment of architecture. That is to be welcomed. In fact a movement can only be counted as truly avant-garde, if a mainstream follows in its wake. Otherwise it is not really an avant-garde after all. While the style moves into the mainstream and takes responsibility for the innovative advancement of the total built environment innovative research within the now dominant paradigm or style continues. There can be radically experimental work even under the auspices of a style that has attained mainstream hegemony. In my theory the articulation of the discipline into avant-garde and

mainstream is a permanent structure of the discipline. Avant-garde research continues also after the research paradigm has attained the status of a hegemonic mainstream style. Innovation needs to intensify and accelerate beyond what can be done within the constraints of real projects that require the secure, economical delivery of state of the art functionality. So the avant-garde design research continues via special manifesto projects as well as via academia and by using the art-world as resource and platform.

A promising style might advance in stages as follows: first it enters the avant-garde segment as one among several competing approaches. Then it might advance to avant-garde hegemony. This has been achieved by parametricism. Then the style starts to participate in the (high profile) mainstream by delivering mature high performance works that are no longer mere experiments or manifestos. This has started to happen via firms like ZHA, Asymptote, Reiser & Umemoto a.o. Finally, it might advance from the status of being one of several respectable mainstream styles to claim hegemony as embodying the generally accepted global best practice approach. I personally operate in both the avant-garde segment and within the mainstream, and I would not like to sacrifice either arena for the other. A firm like ZHA might choose to focus more and more on the mainstream delivery, applying the results of its 25 years of design research. However, even in such a growing, commercially successful firms there remains space, resource and interest to continue avant-garde (not yet immediately applicable) research that might or might not be directly utilizable in future projects. It might only stimulate further research that in turn might be lead to something tangible later on. So in my theory I take the avant-garde to be a permanent institution. The historical movement and innovation does not take the form of an alternation between avant-garde periods and mainstream periods but the form of an alternation between periods of revolutionary advances, i.e. periods of paradigm shift, and periods of cumulative research under the auspices of a long term hegemonic paradigm. This kind of cumulative research is taking place already for the last 10 years under the auspices of parametricism. Mainstream hegemony is not a precondition for such cumulative research, although the mainstream hegemony of a style helps by drawing a much larger community of researchers into its ambit. Even avant-garde hegemony is not an absolute precondition, although a certain minimum critical mass of participants is obviously required to get a cumulative collective research started.

6. You use the term 'dogma' in your article. Is that consistent with a critical theoretical position?

P.Sch.:
Yes! I have made the heuristic principles that actually operate within our movement explicit. The fact of the widespread, even pervasive adherence to these principles means that these principles are de facto inviolate. This is an empirical fact that I poignantly express by using the terms 'taboo' and 'dogma'. At the same time I am explicating the rationality of these principles. I am even explaining the rationality of a practice that - in the heat of practice, e.g. during a design competition – relies on taken for granted principles rather than re-questioning and re-analyzing the pertinence of its principles with every new project or even every design move. Therefore my theory of the dogmas and taboos of parametricism is anything but dogmatic. It is delivering a critical, rational reconstruction of the actually operating a priori principles (dogmas and taboos) of parametricism, and thus rationalizes and redeems our collective intuitions. I demonstrate that we have been right in relying on these heuristic principles and we are justified in continuing to do so (until superior principles are posited). Also, there is an additional rationale to be stressed: Not only is it important for a design researcher to work in a principled, coherent ("dogmatic") way, but it is important for the progress of the discipline that there is a convergence of efforts within a community of design researchers. In order for research to be cumulative it is necessary that design research principles become dogmas, at least for the length of time required to make some real progress. Movements need dogmas and taboos. However, my theory about the realty and necessity of dogmas is itself not dogmatic.

7. You use the philosophy of Niklas Luhmann to ground your theoretical position – especially his ideas on 'communication'. But there seems to be a problem in relating theories of communication to language – especially when using semiology – in that architecture is less about 'content' and more about 'form'. Manuel DeLanda has already suggested that Gilles

Deleuze might have been a more productive philosopher to follow, and given that Deleuze is more materialist in his outlook, and yet is still a philosopher of connectivities, might you be tempted to rethink your theoretical position through the lens of Deleuze's philosophy instead?

P.Sch.:

Both Deleuze's philosophical insights and the creative concepts of Deleuze and Guattari (rhizome, assemblage, diagram, smooth vs striated space etc.) have been recuperated with my theory of architectural autopoiesis. The latter have been recuperated in my theory because they had long since been absorbed into the fundamental conceptual make-up of the architectural movement that later (2008) came to be named 'parametricism'. The former have been recuperated via Niklas Luhmann's philosophical supertheory. Luhmann's theoretical system does indeed take account of all major 20th century intellectual advances from philosophy (linguistic turn, poststructuralism) and science (cybernetics, complexity theory). However, it would not be possible here to substitute Luhmann with Deleuze, simply because Deleuze did not develop a systematic theory of society. Such a theory of society is a necessary framework for a comprehensive theory of architecture that starts with the explication of architecture's place and role in society (architecture's societal function) as a point of departure to explicate and critique the rationality of its discursive structures, and to critically guide its future development by positing avenues for it to upgrade its intellectual and methodological resources. Luhmann proposes to conceptualize the life process of society as a communication process rather than as a material reproduction process. This is - of course – a radical abstraction. However, I think this is a rather pertinent and powerful abstraction. All problems of society are problems of communication. Both the problems and the solutions of mankind have to do with society's self-generated complexity. Even on an individual level, all our problems are problems of communication. Even those problems where the materiality of our life seems to assert itself transform right away into communication problems. For instance, when you fall sick you need to communicate with passersby or friends to call a doctor; then you need to communicate with the doctor and worry about your health insurance, etc. When you want to travel to Australia the physical distance to be overcome is no longer your problem; your problem is whether you can apply for and get a visa; whether you can afford to buy a ticket; whether the congestion and security controls at the airport are well managed; and whether you know how to navigate these controls. The same applies to architecture. The critical issue for an ambitious architecture that wants to contribute to the next stage of our civilization is not the technical-material problem of how to create an envelope that protects against the elements and beasts, but how a designed territory operates as sophisticated framing communication that gathers and orders relevant (socialized) participants for specific communicative interactions. So I believe that communication-theory provides a parsimonious, productive framework for architecture's reflective self-description. However, as I elaborate in the Epilogue of Volume Two of *Autopoiesis,* this theoretical perspective is coherent with an ultimately materialist underpinning. After all, communications are also material processes based on the material media of communication and the material media of information processing. What is important to note here is the fact that, although the proposal to posit communications as the ontological grounding of architecture is radically new, it has been theoretically elaborated in great detail in the 1,200 pages of my *Autopoiesis*. I have also initiated attempts to operationalize and apply this new ontology in my design research at the AADRL and elsewhere. The validity of this proposed new architectural ontology depends upon its consequent elaborations and conclusions – first theoretical and then practical – rather than on its initial appeal when stated and proclaimed as program. It must convince via its results. It is certainly not a question of "philosophical truth."

The implication of embedding architectural theory within communication theory is that all architectural spaces are conceived and designed as communications. Their meaning is the function they support. According to the functional heuristics of parametricism the functions of spaces are conceived in terms of dynamic patterns of social interactions/communications, i.e. as parametrically variable, dynamic event scenarios rather than static schedules of accommodation that list functional stereotypes. The architectural articulation of spaces allows the participants to anticipate the type and character of the interaction scenario and behaviors/communications to be expected. Spaces thus communicate an invitation to participate in the specific social functions hosted. Spaces are communications that frame and order further communications. As such they act as communicated premises for all further communications that are to enfold within their boundaries. They also place the participants into specific

constellations that are pertinent with respect to the communication situation expected.

It has now become possible - for the first time in the history of architecture - to model this life-process and thus to incorporate it into the design process. This is made possible by computational crowd modeling techniques via agent-based models. General tools like "Processing", or specific tools like "MiArmy", "AI.implant" (available as plugins for Maya) and "Massive" now make behavioral modeling within designed environments accessible to architects. Agent modeling should not be limited to crowd circulation flows, but should encompass all patterns of occupation and social interaction in space. The agents' behavior might be scripted so as to be correlated with the configurational and morphological features of the designed environment, i.e. programmed agents respond to environmental clues. Such clues or triggers might include furniture configurations as well as other artifacts. The idea is to build up dynamic action-artifact networks. Morphological features as well as colours and textures that together with ambient parameters (lighting conditions) constitute and characterize a certain territory influence the bevavioral mode of the agent. Since the 'meaning' of an architectural space is the (nuanced) type of event or social interaction to be expected within its territory, the new tools allow for the re-foundation of architectural semiology as *parametric semiology.* This implies that the meaning of the architectural language can enter the design medium (digital model). The semiological project implies that the design project systematizes all form-function correlations into a coherent system of signification. A system of signification is a system of mappings (correlations) that map distinctions or manifolds defined within the domain of the signified (here the domain of patterns of social interaction) onto distinctions or manifolds defined within the domain of the signifier (here the domain of spatial positions and morphological features defining and characterizing a given territory) and vice versa. The system of signification works if the programmed social agents consistently respond to the relevantly coded positional and morphological clues so that expected behaviors can be read off the articulated environmental configuration. However, rather than modeling scenarios frame by frame, agent based modeling works by defining the agents' dispositions and biases relative to environmental features. The event itself is then an emergent global pattern that results from the local interactions of the agents with each other in dependence upon the environment. If this succeeds architecture does its job of ordering the event scenario. The meaning of architecture, the prospective life processes it frames and sustains, is thus modeled and assessed within the design process, thus becoming a direct object of creative speculation and cumulative design elaboration. Architecture's new prospective ontology of communication can thus be operationalized within the design model. This conception is consistent with Luhmann' social systems theory, as well as with Deleuze's and De Landa's philosophy of connectivities.