

Parametricism ups and downs

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Abstract: Diagnostic analysis feels urgent when it comes to set apart different types of Parametricism. These dualities come in many forms: semantic terminology; the discerning between a style and a set of digital tools; the enthusiasts and their audiences; the democracy of the tools and many others. This paper goes through a brief historical background raising questions based on the fast growing writings that try to fill in the deficiency on the theoretical field that the emergent style faces. Aiming to discuss if Parametricism is ready or not to be asserted as the great new style of the generation we find that, ironically, many parameters appear in this input.

Keywords: parametricism, geometry, digital.

Variations are a fundamental part of creation. Being able to see through the possible alternatives of solutions is, after all, the intrinsic part the devoted to architects. Revisiting from a broader perspective is a continuous process that requires creativity and, above all, time. Parametric methodology pledges to be a shortcut on overcoming these limitations effortlessly.

This solution – reflecting strategy provided by the concept of parametricism is often related to various advanced applications – viz, Grasshopper; CATIA – and narrows the new design process into building a relation between scripting skills and creativity. By researching a brief historical background and analyzing the work process of different architects in the past century, it is easy to conclude that parametric design was not invented by computers and it is not an unfamiliar territory for architects. In order to get in depth with this *new* concept it is fundamental to consider and analyze various interpretations of the

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term “parametric”. Three main different approaches come to the surface and combine a consensus to serve as a wellspring for this paper. The first one refers to the mathematical equation, describing a method that introduces an independent variable to make a cohesive relation. An input to generate an output, whereupon the output space has more dimensions than the input space. In other words, variables that can be edited to alter the result of an equation, hence a set of parameters that conducts to an interlacing outcome. The second definition focuses on the capacity of the representative model of the design to automatize according to the attributes implied by the architect. That is, an entity can be easily and effortlessly refreshed in a coordinated way by a change in the input. Synthesizing, the model reflects an immediate change when required. This way, any model in which an action causes an immediate reaction would be considered parametric.

Finally, the third explanation brings a holistic view with “true architecture is always parametric”. In this framework it’s presumed that every construction takes in consideration all the aspects of the surroundings that it was lodged. In other words, it’s a holistic view – the belief that the parts of something are intimately interconnected. «Parametric modeling is not new: building components have been adapted to context for centuries”.² As much as this wholesome view is appreciated, following Mario Carpo’s saying in the ‘Second Digital Turn’ PA Talk at GAD Foundation, «As humans we could not – practically – notate, calculate and fabricate all the necessary parameters, while the computer aided technology proposal would do effortlessly”.³ The idea behind form finding is to optimize certain design goals against set of design constraints, in this case, time. In the other hand, it can be said that although analogue procedure is not able to process huge amounts of data quickly, it is still able to transmit the architectural feel and atmosphere of the final design intentions.

Past that, the first problematic brought by the parametric design process is the autonomy of these systems. Recalling Frei Otto’s form finding process⁴ (Fig. 1) which Patrik Schumacher considered “(...) the only

2. AISH, WOODBURY 2005, p. 152.

3. CARPO 2018, accessed in 8 Jan, 2019.

4. The 20th-century architect Frei Otto studied the shape of soap films, hanging chain models, wet threads, sandboxes, magnetized needles and others physical related experiments in order to comprehend

true precursor of parametricism”,⁵ the proto-parametric methodology – made by empirical evaluations correlated with gravity and other physical phenomena – not always necessarily represented the prime design intentions of the architect. If the material properties take charge of the aesthetical choices, a new relationship between creator and creation is established. One thing is to use this parametric process to find the most efficient, economic and clever manner to build a structure, another is to let the variables impose over the architect. An aesthetic judgement will determine if the output satisfies a set of values determined by the designer. This thin line (or not so thin) between ‘finding’ instead of drawing shall not be ignored. “Intentionality is ours, instrumentality is theirs”.⁶

As we infuse more and more our design process with digital apparatus the term ‘Digital Architecture’ comes in vogue. Although the controversy behind it, debating the role of the architect in this new era is more than reasonable. Considering this on going rapid democratization of the computational tools, the role of the architect itself becomes a topic of how replaceable by programmers they can be in this digital environment. What would be the key traits of the future ideal professional? Digital loves speed, and to reach that the architect is disconnect from the actual landscape and sometimes in this trade quality gets suppressed. A big ambiguity also arises when these tools are strictly related to the style. As an example, late modern architect Norman Foster benefits from parametric tools and programs but still maintaining a modernist aesthetic. This plays a great part when deliberating whether Parametricism should be considered a style or not. Distancing from the stylistic taxonomy would come in handy in a way not to diminish the practice. I think calling it *style* is slightly restrictive... who is a parametric designer? One who is just using these kinds of particular programs, I think it is possibly restrictive I guess, because you are going to say that you have to use these programs or this methodology.⁷

and better construct the membranes and tensile structures. As an example of his works, a mixture of water and soap gravitates to form the minimal possible surface when applied to an outer boundary - this physical phenomenon occurs in an attempt to minimize the tension among its molecules. In A. Peteinarelis words, «Frei Otto established one of the main stepping stones for the transition of architectural thought from the mechanical perception, to a systematic, interdisciplinary design research agenda”.

5. SCHUMACHER 2011-2012, p. 680.

6. CARPO 2018, accessed in 8 jan, 2019.

7. SMITH 2011.

«Parametricism is the contemporary style that is advancing its design agenda on the basis of parametric design techniques”⁸. Form finding tools, simulations and animations have not only aided but sculpted parametric design, so that being able to set apart this ‘epochal style’ from this set of digital tools is compulsory. These above mentioned mechanisms only produce a base for the consolidation of a trend, the tools might become as ordinary as pen and paper. The dependency on these new techniques is undeniable, what we need is solid and reliable theory to clear the roots and fertilize this unbloomed flower bud. At the moment it is assumed that parametric design is driven by process and not theory – method, not meaning. A new architectural style is expected to emerge from this digital revolution, but the concept of style shall be disjointed from simply aesthetic and appearance, after all it carries a historical and scientific consciousness. This cumulative cycles of innovations can’t be reduced to merely its visual aspect.

Thereby, it is stated that analogue and digital practices are not competing strategies but allies in the design process that carry individual intrinsic values. The parametric design process doesn’t rely completely on parametric programs and the possibilities with the analogue and digital applications combined are boundless.

The current state of Parametricism lies as a young and hopeful overachiever. Patrik Schumacher, as the head theoretician on the subject demands that we pick a side in an unpleasant ‘style war’. Schumacher adds the suffix ‘ism’ as a strategy intending to consolidate the movement as a mature style, exposing its unique potential in a paradigmatic way. In another point of view, it highlights the stubborn hardcore obsession with the movement that some theoreticians preach. This idealism can easily be seen as an indicative of unhealthy compulsion. He trusts that innovation emerges from the succession of styles (Fig. 2), proposing progress via revolution rather than evolution.

«Over and above aesthetic comparability, it is this widespread, long-term consistency of shared design ambitions and problems that justifies declaring a style in the sense of an epochal phenomenon”⁹ articulates Schumacher. But why didn’t the previous architects feel the

8. SCHUMACHER 2016.

9. SCHUMACHER 2008.

need to make this the core of their concept? Although Antoni Gaudí, Frei Otto, Heinz Isler, Luigi Moretti and many others also had quintessential parts of their designs ruled by parametric content, they didn't explicitly call it the conceiving of a new style nor reduced the outcome to the process.

Setting aside our theoretical discomfort and complaints, our true intentions within this emerging style should be questioned. Are we expecting that the deep learning is going to be able to come up with the best solution on its own even though we didn't set that as parameters in the input? In a simple analogy simplifying the question, will the computer suggest a leaf of mint in our cocktail knowing that it would taste better even though we didn't present mint in our ingredients beforehand?

Further researching this scope we find that Parametricism world is divided by another dichotomy: the Parametrics and the BIM enthusiasts "(...) they occupy different dimensions of objecthood, one defined by idealism, the other by materialism".¹⁰ It is clear the differentiation between authors, objects and audiences in these two poles (Fig. 3), although the relationship between the extremities is not ideal – brought by economical (dis)alignments, multigenerational differences and others – that creates dimension signifying it more as an intended style. It is uncanny that the optimism of seeing Parametricism as the new big contemporary style is a common interest, as distant as this poles might be they still share the same capitalist coin. After all, are these tools designed for democratic use or for self indulgent spectacles? Recalling the already commented topic, is this new phenomenon broad and widespread enough to be called a style?

As the theory remains in the background losing focus to the process and method, the malleability demanded as a dogma – Parametricism manifest principle – in the Autopoiesis of Architecture¹¹ should be applied to the obsessions and push aside the over demanding doctrines, as it has shown to be one of the most critical parts of Parametricism.

Whether it has already built enough to be a style on its own or remains as a subsidiary style based mainly on methods, it is undeniable that it is the most meaningful scope to be studied and discussed in the present

10. DREAMER 2015.

11. SCHUMACHER 2011, 2012.

architecture theoretical field. It is clear that it has positive and negative points, and even though its role is still insufficient, the development empowers multidisciplinary methods, displaying as a useful weapon to untangle dysfunctionalities in the current architectural framework. In conclusion, the end of the transitional episode that we are facing requires the rising and hegemony of a unified style, and this might be what we are witnessing right now.

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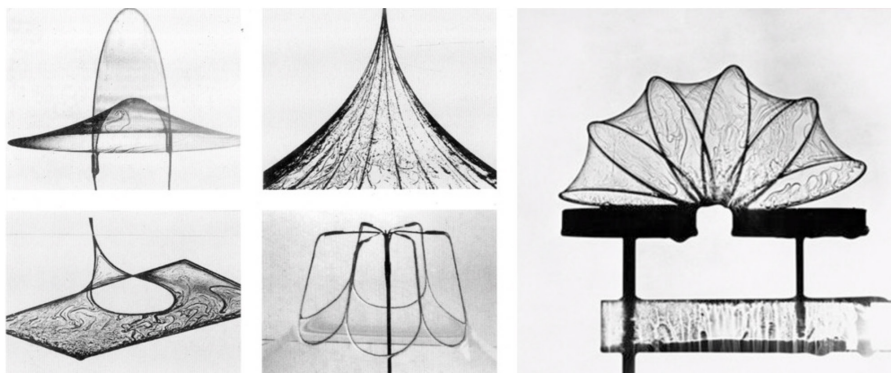


Fig. 1.1 - Frei Otto's study models.

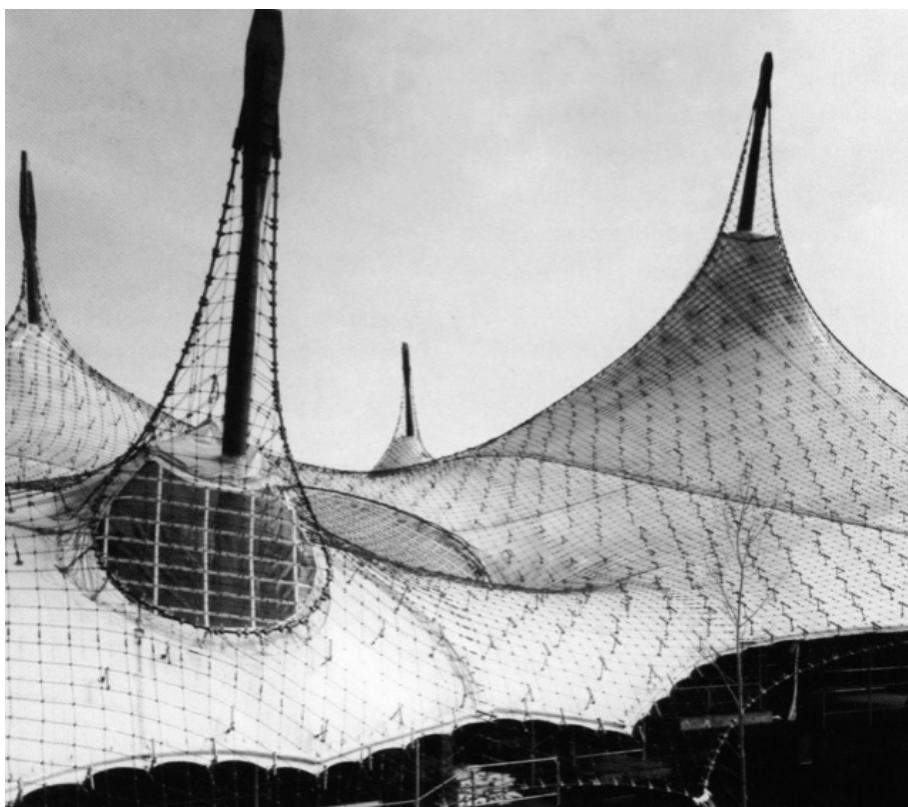


Fig 1.2 - Frei Otto's German Pavilion, Expo '67.

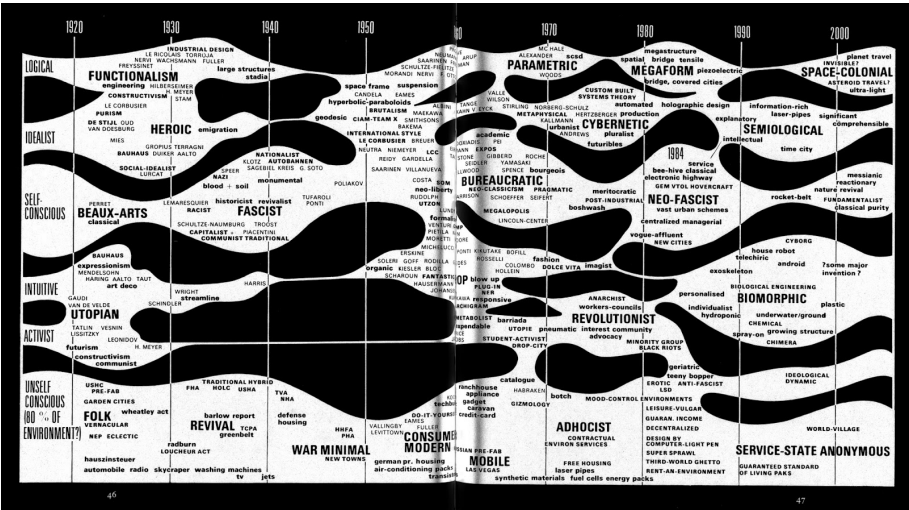


Fig. 2 - Charles Jenck's Evolutionary Tree of Styles, 2000.

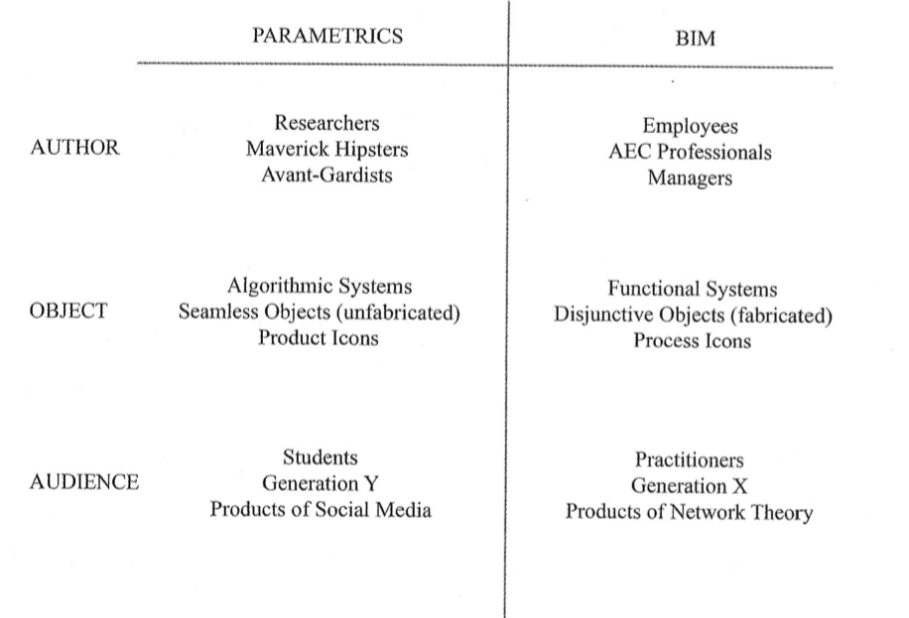


Fig. 3 - Peggy Deamer's chart on Parametrics x BIM.

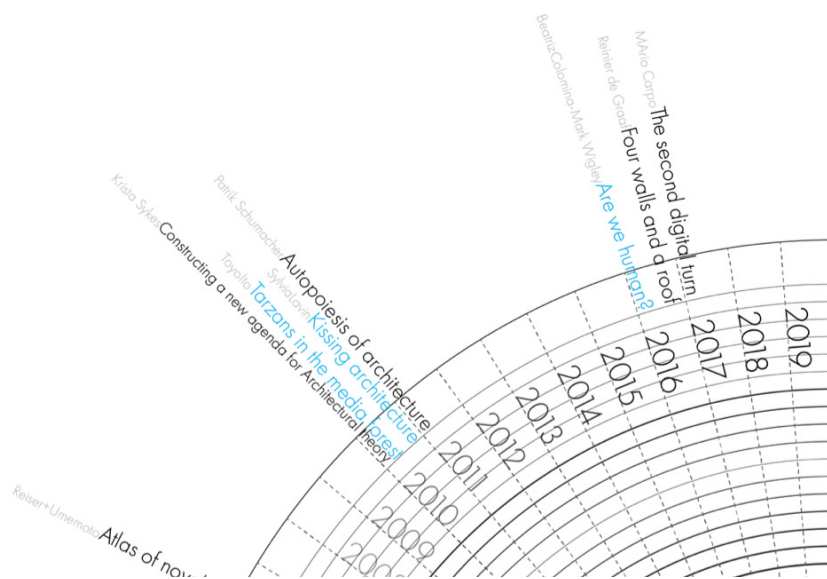


Fig. 4 - Crop of the 'Visual timeline of architecture books from the year 0 to 2020', Ayax Abreu Garcia