Shape Grammar

Architects have used lines to describe meanings for centuries. The lines in their design are related to what they want to communicate. That has been going on for a long period of time.

In the computer age architects have started to look at design process in a different way. Computational techniques should fit the requirements of the subject without distorting actual experience.

Different ways of arranging lines establish different languages of design this procedure is called “shape grammar” and interpreted by procedures called description function. This two determine the link between designing and its description.

There are two types of shape grammar:

1- Standard
2- Parametric

In the standard type the rule is defined explicitly by a pair of shapes in the parametric rules are defined implicitly by a diagram.

Although this rule looks very repetitive, I personally find it very interesting. My own experience is that although we like to explore new and exiting design methods, every time we design, but the reality is that it is not what is really happening in architectural practice. Most often, the time and energy is used for a very ordinary repetitive design and the focus is more on the cost and construction part.

It seems to me that shape grammar can result in faster design process and it can increase the time for design development so architect can focus more on the smaller parts of the building as well which to me will result in better and more efficient design.
The Logic of Architecture

Transformation is a new tool used to design. There are many different types of transformations. Architectural composition can be understood as process of instantiation formation and shape combination.

Instantiation

Shape instantiation is one of the most basic design actions. In design world we have instances of specified shape, the designer creates multiple shapes by adding the primitive shapes.

Transformation

By transforming the shapes, we will have shapes that are same but have changed in someway. There are two types of transformations: 1-destructive 2-preservative. Destructive transformation ruins the object; burning, smashing, and/or dismantling are examples for destructive transformation. In preservative transformation object will remain the same, for example, if we color a chair it still will remain a chair. Preservative transformation gives us many possibilities to create many forms in order to design.

There are two types of transformations: scaling and stretching. Through scaling we produce the same type of shape, though in stretching we change one shape to another. We might consider both scaling and stretching as equivalent. Rotation, reflection, and perspective transformation are some more ways for transformation. There are other ways of transformation, which are caused by combination. Union, intersection, or Boolean are all caused by combination transformation, and they are being used intensively in computer-aided design. Transformation gives us many options for design, it can also be a tool expedite the design process. The process can contribute by creating new shapes and lead to new design methods. The remarkable thing about transformation to me is that we can cover many different design styles with the very same tools. This can be the foundation to faster, easier, and still splendid designs. It seems as if for the very same reason, transformation is a very good tool in computer-aided design.