

Form follows function: Activity defines function, gesticulates space

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The foremost principle of this work is that the base level of architectonic form is spatial, and that the array of activities relative to the practice of habitation and their associational parameters to each other determine spatial boundaries, which might be uncovered, to define form. The array of activities, which define a particular 'mode' of habitation, will vary according to particular functions therefore defining building types. This might also be extended to the individual, in the case of an apartment or house in that the personal activities of an individual might be utilized to define custom form. Therefore defining a place of habitation, which reflects the individual qualities of that individual and responds to their personal mode of living, character and spatial requirements. Computationally I suppose space defined through an array of activities represented in 3D, and that the topology of activities defined geometrically through the application of an array of self-organizing activity maps for the morphology of space, to define form, relative to user/activity associations and context.

Keywords: Emergence; SOM's; Activities; Space.

Analysis of the amorphous form.

Bill Hillier, in 'Space is the machine' suggests that space is a significant aspect of human behavior. Encountering, congregating, avoiding, interacting, dwelling, etc are not just activities that happen in space. In themselves they constitute spatial patterns. A single activity in isolation holds spatial qualities. An activity obviously involves the individual, and although an activity such as skipping may be defined visually; as the motion of the act, defined by the parameters of the individual and the rope, the space carved through the act of body motion will transform according to the individual. There is also

an array of skipping methods, which each will define an individual set of spatial parameters. But this is looking at the act of the individual in isolation. The nature of buildings is that they are shells to house a host of activities of which a variety of individuals will perform. Encountering, congregating, avoiding, interacting, dwelling, etc are not attributes of individuals, but patterns or configurations, formed by groups or collections of people. Hillier states the relation between space and the act of living lies in the relations between configurations of people and configurations of space (Hillier, 1996). Therefore the approach will define a spatial morphology in relation to configurations determined by the associations of

Figure 1
An array of activities determining a 'good fit'.

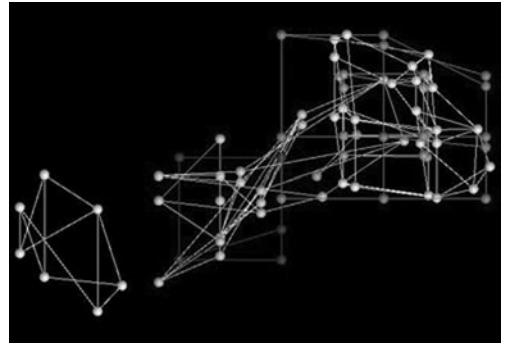
an array of activities.

In 'The Social Logic of space' Hillier proposes that buildings transmit information through their interior structures. Both through general variations in the basic syntactical parameters and – perhaps primarily – through variations in these, which appear when a plan is looked at from the view of its various constituent parts. Here, he defines the syntactical layout of plan forms from each room within a plan, defined as a discrete entity, therefore defining the individual relationships to the whole. This approach illustrates the lack of homogeneity within plan forms. Hillier states that *"buildings...map relations between [different types of users] through some parameterization of the syntactic dimension [and suggests] that as the forms of solidarity to be mapped into a building change and the relations between users change accordingly, consequent changes in the syntactic dimensions will construct a building of a certain type, and with certain individuality"* (Hillier, 1996). Where this illustrates an expression of space as an emergent phenomenon, the distinction between theory and analysis was not bridged towards the organisation of 3D space.

Liquid architectures and other futures

The idea of reconsidering the 'room' and that rooms are more than building blocks to inform a design is not entirely new. This also applies to the "self-organization of activities" to shape up the pattern of spaces. Novak has invented a set of conceptual tools for thinking about and constructing territories in cyberspace.

Novak introduces the concept of "liquid architecture," a fluid, imaginary landscape that only exists in the digital domain. Novak suggests a type of architecture cut loose from the expectations of logic, perspective, and the laws of gravity, one that does not conform to the rational constraints of Euclidean geometries. He views trans-architecture as an expression of the "4th dimension" that incorporates time alongside space among its primary elements. Novak's liquid architecture bends, rotates, and mutates in interaction with the person who inhabits it.



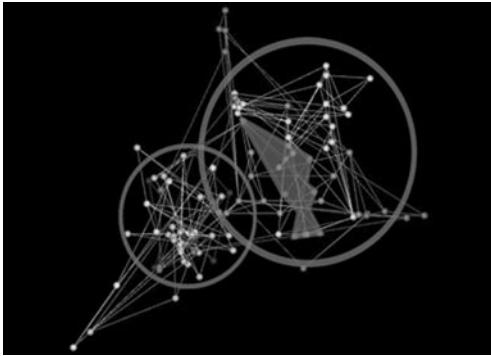
In liquid architecture, "science and art, the worldly and the spiritual, the contingent and the permanent" converge in a poetics of space.¹

Novak's work concentrates on the virtual, and an architecture that envelops and responds to the user, in 'meta-reality'. Lars Spuybroek (NOX) work bridges the gap between the virtual and analogue. Investigating notions of complex space, with note to the Foam House, Soft office and The Future is Now, the approach utilizes various techniques, the shift between algorithmic and analogue (and vica versa) is generally rationalized, and therefore the development of architectonic form which is emergent is breached by the application of traditional top-down design methodologies.

The generative modeling of activities to define space and architectonic form

The intention is to define a methodology to translate information into object. The approach utilizes the computational methodology of Self-organizing maps (SOM's), expanding these 2D methodologies of spatial design into 3D (Derix and Thum 2000). Activities are represented by an individual SOM in an environment into which other SOM's representing other activities are placed. Each activity is created with its 'personal' association attributes (Ireland and Derix 2003).

¹ <http://www.artmuseum.net/w2vr/timeline/Novak.html>



Space is defined through the boundaries and interrelations of the self-organizing activity maps. The environment composed of a variety of these, each searching their neighborhood for others, with whom they share some association. Each activity map is a discrete entity, which through association will assemble to form a whole. The overall task is for individual activities to recognize relationships that

are a good fit, in order to illuminate the emergent pattern.

The essential demonstration is that the inherent dynamics of SOM's illustrate any hidden patterns within an organization, which may not be seen in diagrammatic form. The exciting prospect of adapting SOM's to spatial morphology is that they will transform their typologies creating 'new' spaces, which may not be perceived in a hylomorphic process of developing forms. The top-down/Cartesian approach to form identifies intrinsically separate but interacting parts, whereas the approach demonstrated illustrates a process grounded in the primordial undivided wholeness of natural complex systems. Concluded through the adaptation of discrete entities, from a conglomerate of parts into an organic whole, the process has to date illustrated an abstract model of spatial proportions. This is to be extended and will be developed to take account of contextual characteristics.

*Figure 2
Emergent pattern: All social and private activities are grouped. The work activity, which was mostly associated with social activities is clearly located within the private domain..*



*Figure 3
Impression of inhabited form.*

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