ARTIFICIAL PATTERN LANGUAGE & RECIPROCAL LEARNING

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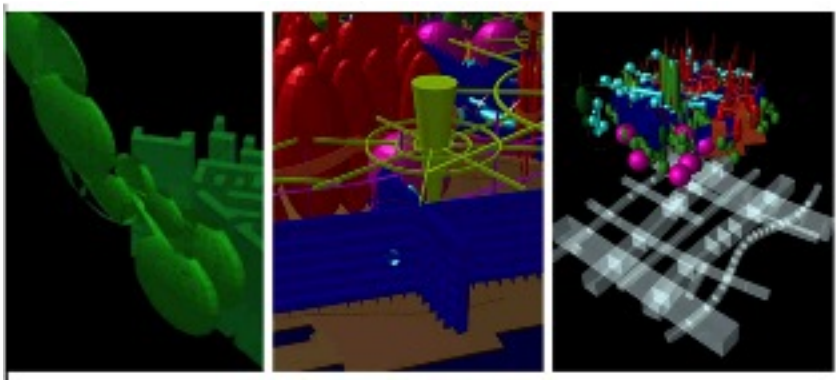


ABSTRACT

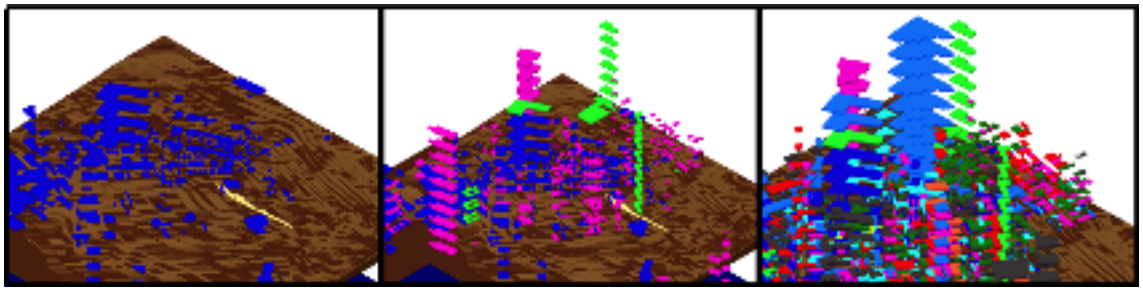
The paper explains the organisational framework for creating three-dimensional patterns representing artificial urban landscapes as a design aid for architectural students to analyse, interpret, visualise and manipulate the complexities of the urban environment. The educational module is initially both a CAAD and an urban design teaching tool, and becomes, through these, a visualisation and realisation model and finally a design aid and platform for the manipulation of the urban landscape. The organisational framework to construct the representative three-dimensional artifice utilises 14 different layers of interconnected, three dimensional patterns as an information base. The classification systems of the framework are intended as an educational tool for analysis, discussion and consequent comprehension of the real as it is formed into a representative artifice within the computer. The inherent facilities of the CAAD software programme (in this case Archi-CAD) are utilised with an adapted logic, specifically the software's ability to create three dimensional library parts and place these items in various layers of the framework allowing variable permutable displays of the pattern items and consequently their interfaces. This categorised framework is a three-dimensional representative artifice enabling the 'pregnant' potential(s) of what the city can become to be anticipated as 'nth potential' scenarios or 'mightlyhoods' (1). These are applied to the artifice through the formulation of manifesto aims, producing innumerable potential future scenarios for the city, which can be reciprocally assessed through the inherent visual permutability of the layers within the software.

The overall aim of the project is to create a set of systematic design 'aids' that enable existing urban matrices to become conceptually fluid, suspending our disbelief in future re-configurations. This conceptual fluidity develops from an interpretative programmatic language of the existing city's patterns as a representative simulation, creating patterned artifices, which have imbued meaning and can grow, amend or move within the city matrix. The theoretical framework of the project sits within the natural sciences whilst the

representative language it utilises is influenced by media culture and computer technology. Through seating the project firmly within natural science theories, the project endeavours to amend the way that we conceive of the urban landscape, substituting ‘our nature’ and its reflective artificial patterns (our urban landscape) for biological nature and its reflective patterns. Nature possesses evolutionary patterns which have a base code, where information is strategically related to the environment to produce forms of growth and strategies of behaviour, optimising each particular pattern related to the contextual situation. “Codes are fixed but the way they are expressed or repressed is environmentally dependent. The forms and strategies being the result of extrapolated codes to environmental optimisation” (2) this natural cycle producing patterned entities from its flowing coded repository, which are appropriate for survival. Each entity is an integral part of the natural cycle, formulating in their accretion the dynamic sea which they effect and are reciprocally affected by, producing the constant flow of environmental change revealed through the temporal ‘being of things’. The ‘being of things’ is capricious and interrelated with other entities and contextual mediums; it is indivisible from the whole as an open system, which is interdependent with other successively open systems. The being can in itself be the medium for other entities and groups of beings such as flocks of sheep or blades of grass can be said to form a context. There is then some kind of relationship between the being and the medium, where ‘the being of things’ should be seen more as emerging from the medium, rather than distinct from the medium because in some way its existence is interdependent with the medium.

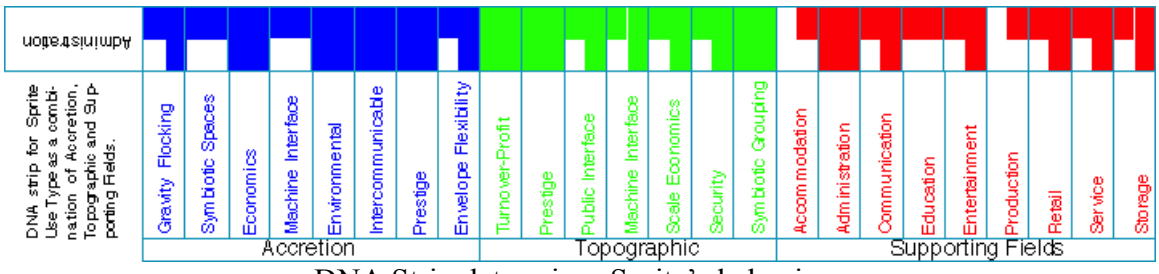
These natural theories relate to a more ephemeral pattern language where form is generated through inherent programs or strategies (scripts). These continually adapt in response to environmental flows, flux’s and rhythms, generating temporal forms through their convergence and condensation, which are appropriate for particular moments in time. This parallels the premise that our comprehension of environment (hence urbanity) has less to do with defined territories and formal bodies and everything to do with these flows, fluxes and rhythms. Form is transient, never more than a temporal illusion, the ‘temporal being of things’ representing a formal animation of appropriate solutions growing from one super-positioned state to another. These animated changes reveal the patterns of their strategies and consequently the programs (scripts), which constitute their ‘being’ (haecceity). Intelligent ‘beings’ learn to read these ‘trace’ patterns of existence and it is this pattern recognition, which is inherent to their comprehension and subsequent manipulation of the environment. Pattern recognition enabling intelligent ‘beings’ to successfully project and intervene in the local environmental patterns for their own benefit. Today's cities can be conceived of as temporal artifices, where our urban landscapes are constructed and consumed as a reflective pattern of the activities of their milieus. Our mapping and representation of these complex patterns of ‘being’ tends however to set up ‘categories’ in stasis (frozen patterns), we map that which is a moment in time rather than mapping the forces which shape that moment in time. A new form of representation is required that recognises the dynamics of the environment and the organisational forces generating the processes through which these forms emerge, in order to design appropriate interrelated, adaptive and generative patterns within urban landscapes.

Representation is crucial to the comprehension of our environment, whether visual or verbal, representative language is an integral part of our conceptualising process, forming an active and constantly evolving process that serves to communicate, comprehend and problem solve. The design processes in comprehending and subsequent manipulation of environmental complexity tend to conceive through relationships. Grouping things into patterns or categories, where the relationships are "either combinations or similarities" (3) creating patterned associations of data under abstracted themes which are constantly being tested and amended as concepts through the feedback methodology of visual representation and verbal communication. This urban complexity is generated not only from the sheer condensation of form over time as information, but also from urbanities 'core conceptual process' that includes space as delineated but coherent forms supporting activities, which are inextricably linked to their formal definitions, creating a whole from opposites. The usual design aids of block models (real or virtual) seem to preferentially represent the positive formal aspects and miss the essential life-flow of programme activities that permeate the urban space. A design aid similar to sketching, which is not absolute and through its lucid incompletion promotes participation, discussion and active conceptualising, would seem to be more appropriate. Information gathering from the existing city needs to be coordinated by proposing categories of association that allows groups of researchers to discuss and interpret these categories creating their own definitions. The categories utilised, whilst initially simple (as in opposites), can also have cascading subsets of category definitions creating a comprehensible complexity, as long as the routes through the subsets remain apparent. In this case the mapping process takes place under three main categories, 'Immutable image', 'Mutable activity uses' and 'Desirability', producing fifteen subsets of interrelated information within which there are further sub sets. Immutable image is influenced by Kevin Lynch's definitions of 'Image of a City (4), which are abstractly reinterpreted as a group of subsets consisting of *Routes, Negative Nodes, Positive Nodes, Edges and Fields*. This category corresponds to our visual recognition of the elements of the city. They are our visual identification of place and hence belonging creating 'existence footholds'. Mutable activity uses refers to the spatial activities or facilities contained within the fabric envelopes, influenced by Ubiquitous Urbanism (5), the sub set consisting of, *Accommodation, Administration, Communication, Education, Entertainment, Production, Retail, Service, Storage*. Desirability relates to the quality and location of the existing urban landscape, which is dealt with as ten categories of relative percentages.



Veneers: Retail only; Retail, Service and Education; All activity-use categories

The information gathered from the city is initially interpreted as sets of coloured patterns, termed veneers, within extrapolated layers of computer space over a representative artificial landscape. These veneers form the anchors and categorisation platforms for a more complex set of three-dimensional patterns of activity-uses, which are representative of their behavioural strategies for existence within the urban landscape. The base blocks of this three-dimensional pattern system are termed 'sprites' whose physical dimensions are derived from the spatial necessities of our 'activity uses'. The dimensional information emerges from the research of existing use typologies under the nine activity use categories above. Each sprite's dimensions consist of the irreducible activity space associated with the primary functioning of that particular use type. For instance one's humans actions in space performing the requisite task associated with that activity use. This space becomes a three dimensional measure for delineating the 'space-shape' that is termed a sprite. This definition norm does not however relate to all of the activity use types. The sprite formulation can relate to any of the following, (a) based on personal/ machine action space (b) based on machine/ human manoeuvres and resting positions (c) based on construction. The behavioural nature of each of these sprite spaces in relation to the urban landscape is then investigated and coded using three main categories, *accretion, topography* and *field-to-field* relationships. These categories define the space shapes tendency to flock and group generating distinctive morphological shapes that desire particular locations within the urban landscape. The resulting building envelope which is termed a 'megalope pattern' consisting of a grouping of the sprites for other programmatic reasons such as sociability, economy prestige and or process at any particular location. These behavioural programmes are likewise derived from typology studies together with observations of the existing urban landscape in use. The programme for a particular space shape use type might be written as follows: *Field to Field* (a) Locates adjacent to major infrastructure routes and nodes. (b) Locates centrally to the overall market field. (c) Ease of goods and market access essential *Topographic* (a) Public face and image a major consideration, (address hierarchy). (b) Can afford higher rents relative to turnover and profit margins. *Accretive;* (a) Gravitates to ground level, or the pedestrian access plane. (b) Tendency to group symbiotically and form a gravitational matrix along major routes and nodes. (c) Improved logistics through the shared route and node as image. (d) Size determines gravitational attraction. These written scripts are edited into a series of visual graphs, which include all the programming reasoning for the nine 'use types'. Gravitational weighting as a variance from one to four is applied in order to create a symbiotic visual record of the sprites behavioural qualities. The code of each use type emerges from this process as a DNA strip determining how that sprite behaves relative to the artificial urban matrix.

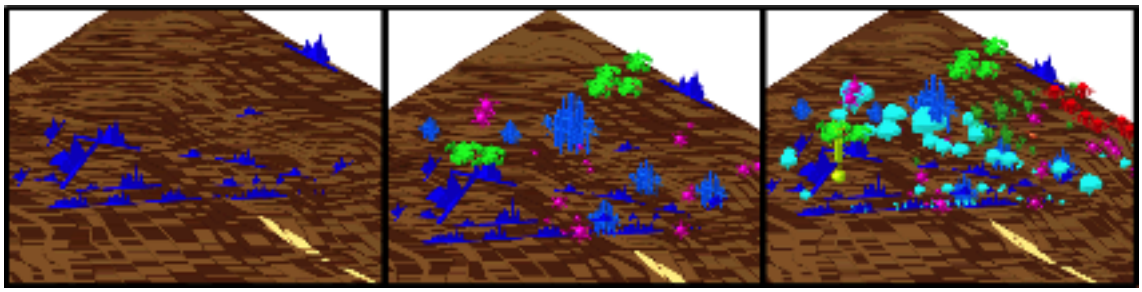


DNA Strip determines Sprite's behaviour

The visual language to represent these sprite and megalope patterns was influenced by media icons and computer graphics, a symbology which carries recognisable associations of programme, behaviour or in the case of the media representations of Nike, Coca Cola and Levis, infer a lifestyle. The sprite 'spatial shapes' are interpreted visually into three-dimensional icons as mnemonic formal summaries of their programmatic urban 'behavioural nature', creating a pictogram which is similar to that anticipated in the science fiction novel Eon by Greg Bear (6). With this sprite 'space shape' system the physical arrangement of enclosure to the activity space nature is conceptually disassembled in that it can be envisaged as event platforms of activities with a strategic programme. The formal bounds disintegrate such that activity spaces as delineated 'free radicals' can flow to create new configurations and permutations. This disintegration definitive enclosures is conceptually important in order that the design of the urban landscape can become hierarchically more concerned with the 'techne' of space making rather than the 'techne' of form making.

The representational artifice can be seen in any combination of the layers of information by simply turning on and off information layers. Consequently the complexities of city can be visualised in any permutation as the interface of patterns and their programme behaviour. The ability to comprehend the existing city's pattern language enables us to project and intervene in the patterns.

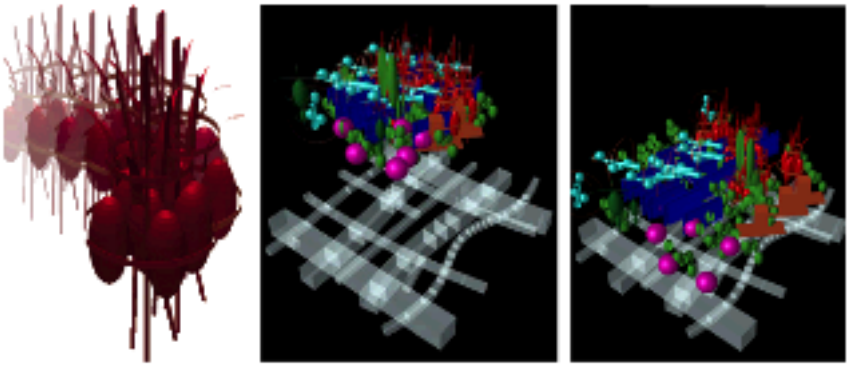
Megalopes: Accommodation; Administration; Communication; Education; Entertainment; Production; Retail; Service; Storage.



Megalope Patterns: Retail only; Retail, Service and Education; All activity-use categories.

A series of aims for potential future cities are then set out as manifesto aims. These can then be used to amend the DNA strip code of the sprites and follow through the process of these programmatic amendments influencing the existing fabric of the city. The amendments conceptually initiate the mobility and flow of the sprites as momentarily free radicals generating new flocking patterns and consequently new morphologies at different locations. This sprite mobility does not in itself necessitate the destruction of existing fabric; they can flow and reform leaving the formal aspects of the urban landscape intact. Pattern conflicts between *mutable facility* and *immutable image* can then be assessed in terms of retaining and or replacing the existing fabric within the holistic

concept of the proposal assessing the difference between several future city aims against the existing fabric of the city. The representative artifice enables the 'pregnant' potential's of what the city can become to be anticipated as "nth potential scenarios or mightlyhoods", producing innumerable potential future scenarios for the city, which can be reciprocally assessed through the inherent visual permutability of the layers within the software.



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