Landscape urbanism’s current theoretical argument embraces flexible operations that address fluidity, non-linearity, open-endedness and indeterminacy. The representation of these processes then asks for techniques that promote the in-between and the unexpected through abstraction. Diagrams, ideograms, imagemaps, datascapes and map drawings are part of the modern repertoire of representation techniques that deal with these processes. Amongst them maps have a prevalent position in landscape, both for their ability to reveal relationships and operations in the land, and for their analogies between the actual geometry of the earth and its corresponding depiction in a two dimensional medium. Within this frame the map demands investigation and experimentation: almost ten years ago James Corner articulated the need to revise, enhance and invent representational techniques that engender more engaging landscapes. Few responses to Corner’s call have been advanced within the landscape discourse. Among those responses the most representative are these:

Tree City, 2001. OMA and Bruce Mao won the Downview Park competition in Toronto, with a project that inverts figure-ground relationships by portraying landscape’s legibility as figural density against a suburban ground.

Mississippi Floods, 2001. Anuradha Mathur and Dilip da Cunha produced map prints (screen prints with information layered and erased) and photo-transects (that is, photomontages formed by maps and horizons of journey) in analysing the Mississippi river as a dynamic, living phenomenon that asserts its own dimensions.

Comhrá Maps, 2004. CHORA and Gary Doherty created maps that unite 38 divergent local groups in future spatial negotiations. They serve as a prototype and catalyst for future projects, acting as a device to negotiate and enable conversations and dialogues.

Singapore Gardens by the Bay, 2006. Field Operations designed a plan where a graphic technique similar to colour halftoning defined levels of intensity (porosity) for events occurring over time.

Deccan Traverses, 2006. The design firm Mathur/da Cunha proposed a survey of the peninsula area surrounding Bangalore, India, where landscape is understood as a series of measures and articulations, constructing ground for ‘fresh vocabularies and future interventions’.

Almost half these proposals originated at PennDesign, an institution initiated through Ian McHarg’s leadership in the 1960s and which has now built up a substantial mapping tradition. McHarg produced analytical maps and plans that defined a rational planning system for the land. His mappings depict a synoptical landscape from above, based on layering and transparency, where various strata of information are given gradations based on their relative values. McHarg’s breakdown of a ‘thick’ surface produces thinner films of information depicted usually in
plans although sometimes he uses sections and aerial perspectives. Mathur and da Cunha follow the mapping tradition and their work acknowledges the constant changes and negotiations of an unpredictable Mississippi river. Deccan Traverses has adopted a similar approach by investigating Bangalore’s landscape as a ‘basis for inventing new tools of governance and design’, providing an alternative to the city plan. This project communicates the city’s landscape by constructing it in the eye as it is in the land, and represents a reaction to the geographic maps and photographic images that have depicted the city for two centuries. Sequential photographs, topographic reliefs and sections, timelines and diagrams are overlapped on abstract ancient maps and on photographs. This superimposition renders images that are too abstract to understand were it not for the separation of their layers as independent studies that are very similar to Corner’s map drawings.

There is a disconnection between the theoretical representational framework within landscape, more specifically mapping, and the production of innovative (but not necessarily novel) techniques. The disconnection is chronological as the schemes and ideas that ask for new representational methods emerged almost ten years ago, and were usually exemplified by the work of architects, urbanists and artists. Since then various representational discourses have held to them, as they offer plenty of fertile material for speculation about how they engage with dynamic, open-ended and indeterminate processes. Furthermore, the disconnection is amplified by the limited generation of inventive techniques as it is apparent from a review of international projects and design competitions. The inherent characteristics of landscape pose difficulties in the depiction and representation of landscape. These difficulties should be considered not as a problem but rather as a challenge that offers possibilities for innovative techniques. James Corner has already stated a need for ‘the realignment of codes and conventions’ from existing techniques. In addition to this, I suggest that the borrowing of existing methods from disciplines not akin to landscape (such as architecture and urbanism) should be explored. Essential elements and rules are preserved from the original and its alterations ensure that it takes root within the landscape framework. This tactic is more than simple re-use as it entails a reconstitution of rules, procedures and functions. The use of existing but alien conventions simplifies semantic organisations and redefines their representational limits and boundaries as new targets and objectives.
Reformulating maps

Maps operate in two ways: on one hand, they expose and reveal. They make known part (or the whole) of the earth’s surface by making known its features and characteristics: they expose relationships between components. As a travel aid a map is a planning tool that outlines the presence of hills and mountains, the proximity of a petrol station or the location of a picnic ground. In this sense maps present a reality: they bring before us a surface with particular attributes highlighted.

On the other hand, maps are also tools that hide and conceal what exists: they expose only specific features and attributes from the infinite imbroglio of reality. Maps permeably render a small percentage of existing features, leaving behind a vast majority that will remain hidden and unknown. This article focuses on the representational qualities of maps, rather than their conception as presentation devices. Both connotations use abstraction to depict reality. But while the latter focuses on the authoritarian role of maps as effective, precise and up-to-date means for conveying information, the former is embodied by presences and absences; and most importantly, by the operations in their selection and depiction.

Maps have had a prevalent position in the representation of landscape, not only for their ability to reveal relationships and operations in the land, but also for their analogies between the actual geometry of the earth and its corresponding depiction as a two-dimensional plane. They are analogous – yet abstract – artifacts that explore, confirm and synthesise. As an exploration, maps investigate unknown regions and awaken latent forces. They identify relationships and connections, leading to insights and discoveries. Examples are the maps of the known world from the early sixteenth century, in which earth’s continents ‘seemed to fit together like pieces of a puzzle’. Geologic evidence supported the theory of a single large continent called Pangea, and plate tectonics is now accepted as the explanation for continental patterns. Some relationships may be invisible to the eyes, and are only revealed when seen through the map. However, a map can also work as confirmation for assumptions, suspicions and hypotheses. Although their discoveries operate as evidence in validating, authenticating or refuting, their role does not end there, as they lead to greater insights and new premises. Finally, as synthesis maps become ‘a coherent but abstract statement concerning patterns and relationships being uncovered’. James Corner considers these types of maps to be of a rhizomatic nature, borrowing concepts from Deleuze and Guattari in regard to the ‘plane of consistency’. These maps systematise their material into analytical and denotative schemas, becoming ‘a systematic montage, where multiple and independent layers are incorporated as a synthetic composite’. Corner presents Charles Joseph Minard’s famous narrative map of Napoleon’s army in Russia as an example of a multiple and inclusive synthesis of complex information. The map amalgamates the size of the French army, the locations and times of battles, vectors of movement, topography, place names, weather, temperature and the passage of time, and it identifies the relationships between all these events, creating a complex network that can only be described as a field.

As a map explores, confirms and syntheses, it is evident that some phenomena are invisible to the naked aye and can only be seen by means of the map: achieving visibility through representation rather than through direct experience. Although the continental drift theory was not postulated until last century by Alfred Wegener, Juan de la Cosa’s map played an important role in its emergence. By incorporating the New World (the Americas) with the European continent in his sixteenth century Mappa mundi, he presented the first evidence that
the shapes of continents on either side of the Atlantic Ocean seemed to fit together. (The presence of similar fossil evidence in continents that are now great distances apart corroborates the theory). Even though speculation on this hypothesis was evident during the sixteenth, seventeenth and nineteenth centuries, it was not until 1920 that Wegener presented a more complete theory that is currently accepted as valid.

The construction of maps, in particular those employed as 'visual communicators', follows established techniques, conventions and procedures, generating ordered and codified representations. Examples of these types of constructions are topographic maps where the most important elements are contour lines, orthodox and artificial devices that conceptually represent valleys, hills and the steepness of slopes. These curves do not exist in reality but are result of connecting isohypses, or contiguous points of the same altitude. Surveying exercises identify elevations in the terrain, and trigonometric calculations interpolate the values to generate contour lines. Additionally, other cultural features (roads, buildings, boundaries, railways, power lines) and natural ones (lakes, rivers, swamps, wooded and cleared areas) may be included in the topographic drawing. However, these types of maps are not only used in architecture, geography, planning and mining, but are also central to other recreational activities such as camping, canoeing, hunting and fishing.

The gathering of information has already defined which elements need to be mapped (in the contour map these elements are usually cultural, water, relief, and vegetation features), how the information is organised (interval between contours, scale, units of measurement, orientation) and how it is synthesised (grid as a reference system as well as different colours for each type of feature, like black for buildings, red for roads, green for wooded areas, and so on). The makers of these types of maps are geographers, cartographers, urbanists and planners among others, producing geologic maps, road atlases, thematic maps, cartograms, and other forms. Although these map makers have no direct contact with the user, their goal is to intervene in spatial and social processes.

Maps operate as 'visual thinking' tools where their construction does not follow established rules but adapts to the type of problem and data to be presented by disclosing and staging phenomena from the world. Rather than being just a reflection of reality, a map as visual thinking device has to substantiate itself through these two processes. Disclosing pertains to the revealing and uncovering of data. From the infinite number of phenomena that 'construct' reality, only specific pieces of information are relevant to the map maker: a map does not aim to present a copy of reality, but to divulge and exhibit data from that reality. It is a sieve for the world, separating fine, relevant parts from a raw and coarse totality. Through gathering, selection and rejection, it brings together a set of data that has to be mapped. Disclosing is usually a linear activity, as the material is gathered through rigorous criteria. Unless the collection of material
is impractical, disclosing has to define new rules for selection. Otherwise the material gathered is malleable and can acquire different configurations during the staging process. This process is iteratively as it deals with the organisation and restructuring of data. It works both as a replication or representation, and as a synthesis that integrates and organises. It produces a coherent and abstract statement that uncovers relationships. This synthesis is an open-ended recourse that can potentially engender infinite iterations.

A map becomes a convention when disclosing and staging are operations whose outcome is already known: instead of exploring or synthesising, they become a confirmation. This authentication process is used in disciplines where updates and actualisations are necessary to validate information. For example, after the catastrophic eruption of Mount St Helens (Washington, US) in 1980, the topographic survey confirmed a reduction in the number of contour lines as the height of the volcano decreased from 2950m to 2550m. While this may operate well in other disciplines, landscape asks for experimentation with conventions when challenging their potential to reveal new relationships. James Corner advocates for new techniques of mapping, not by inventing novel forms, but by reformulating what already exists. The use of existing conventions both simplifies semantic organisations, and redefines their representational limits and boundaries as new targets and objectives that are pursued. A classical model that explains these latent faculties is the figure-ground map traditionally used to depict solids and voids in urban environments. Buildings and structures are usually represented as dark (black) figures over a blank (white) background, generating a poché plan. In this kind of map the presence of defined boundaries stages and constructs figure and ground. Christopher Alexander uses this construction to define positive and negative spaces: positive space is defined by boundaries (usually buildings), and negative space is the amorphous residue left over around buildings. A contrary critique of figure-ground affirms that it is a tool that assigns false hierarchies and controls power. Bernard Hoesli affirms that 'space inside and between architectural objects is in part of the same medium, the same whole'. In demonstrating this, Hoesli refers to the Nolli Plan of Rome (1748), where solid and void are colloquially and perceptually distinct, but conceptually complementary aspects of the same medium. Arthur Drexler identifies two conditions in Mies Van der Rohe's Barcelona Pavilion (interior and exterior) to later concatenate them as a fluid medium channelled between planes: interior and exterior space, no longer rigidly opposed, are now simple degrees or modulations of the same thing.

These two approaches to figure-ground are characterised by the definition of figural edges. One approach outlines figures with boundaries or edges through a discrimination process; the other 'fades' figure and ground with no defined threshold via differentiation. To discriminate means 'to make a distinction, as in favor of or against a person or thing'. It comes from the Latin prefix discrimin-, which means 'separating line', that which divides and makes distinctions. The criteria used for creating the line defines the difference itself. When applied to figure-ground, discrimination is the process that assigns figure and ground characteristics to components based on specific criteria that have to be met, and indicates the distinction between the two by using lines or edges that demarcate each region or territory. Examples of figure-ground discrimination are the poché plans used by Colin Rowe, where buildings are represented in black and the leftover space in white. Edges tend to be seen as part of the figure, separating it from the ground. These concepts are derived from Gestalt psychology, specifically its 'principles of perception'. To see a figure one must be able to group regions for figures to appear, and psychologists have developed a series of principles that deal with the visual strength of perceptual groups as figures separated from a background. Some of these principles are heterogeneity (a figure emerges when a visual field is organised in groups), contour (objects are seen as figure if they have a definite edge), surroundedness (completely surrounded objects tend to be seen as figure) and orientation (objects oriented horizontally and vertically tend to be seen as figure). These principles are widely used by cartographers and geographers, who have defined a series of guidelines and rules for the construction of maps.

In contrast, to differentiate is 'to perceive the difference': something (or someone) can be identified because it has a characteristic, quality or feature that others do not have. What is dissimilar is noticed because of its inherent attributes. The term comes from the Latin differre which means 'to make a distinction, as in favor of or against a person or thing'.

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A test to detect colour blindness. The test uses plates with a circle made up of different sized dots of slightly different colours, spread in a random manner. Within the dot pattern, and differentiated only by colour, is a number which the viewer has to identify. The test detects red-green deficiencies and their classification (partial or absolute). For example, what a normal person detects as blue-green may appear as grey for a person with protanopia (red-green colour blindness), because the visible range of the spectrum is shorter at the red end compared with that of the normal. The use of randomised dots in colour and size sets up an organisation where no patterns are perceived except by colour. By modifying colour hue and saturation, Ishihara was able to insert figures (numbers) which are visible or invisible to viewers. The differentiation is given not by a line or edge that separates the colours and identifies figural numbers, but by the quality of the dots themselves: changes in their hue will be used in testing visual perception.

In the last twenty years, cartographers and GIS communities have acknowledged the need for uncertainty to be considered and included in maps. For them 'uncertainty' refers to three separate sets of characteristics: deliberate misinformation; spatial and attribute data quality and variability; and erratic temporal information. The first two groups are concerned with the accuracy and precision of data. The third group is concerned with uncertainty introduced by temporality, and it is this group which is addressed in the following examples. The representation methods developed by cartographers depict uncertainty by manipulating colour saturation and focus, both of them implying a lack of clarity or mixture of possibilities. Saturation is the 'purity' of a colour, and focus removes crispness of lines and symbols in edges, fills, areas and resolution. These methods are very similar to Ishihara's principles for colour perception, and are also used in halftoning, a reprographic technique that simulates a continuous tone by superimposing spaced dots of varying sizes (as in newspaper photographs).

The potential of maps as abstract creative artefacts has been largely praised by designers and philosophers. Denis Cosgrove affirms that 'the map is both the spatial embodiment of knowledge and a stimulus to further cognitive engagements'. Gilles Deleuze and Felix Guattari declare that 'the map does not reproduce an unconscious closed in upon itself; it constructs the unconscious'. James Corner evades this tendency of referring to a noun ('map') and uses 'mapping' instead. For him, mappings 'discover new worlds within past and present ones; they inaugurate new grounds upon the hidden traces of a living context'. If landscape aims to unfold and open up the potential of maps, it does not necessarily have to invent or devise novel representation techniques. Existing conventions and practices from other disciplines hide latent forces that come into action when approached as representation techniques in landscape. Colour perception tests (ophthalmology), halftoning techniques (printing) and depiction of uncertainty (cartography and GIS) address temporality, irregularity, indeterminacy, liminality and 'in-between' conditions.

By bringing techniques from other disciplines and immersing them in the landscape discourse, their baggage as conventions and established methods is renewed, offering the opportunity to redefine their representational capacity, limited only by experimentation. Their inability to represent additional relationships is only a temporary condition, as these reformulated techniques have inherent abilities and potential to achieve such representations; these potentials are not determined by the technique but by speculation and enquiry. Landscape asks for speculation and enquiry in conventions when these are unable to reveal supplementary relationships (but not incapable of revealing them).