Implementing Advanced Knowledge

Iaac bits

The Aesthetics of Sustainability

Ilaria Di Carlo

The Aesthetics of Sustainability[1]

Introduction

Let's consider, honestly, the concept of Sustainability.

Sustainability may well represent a new form of humanity — more precisely, the fourth human metabolic system[2] but, as proposed in many urban and landscape projects, it often lacks a quality essential to any anthropic space: seduction.

Sustainability has to find its own power of seduction if it is to compete successfully with the ambiguous, but established charms of the unsustainable city.

Talking about sustainability as an ethical necessity is a given, but aesthetics, style and emotions must also come into play. Those seductive elements were essential to making the city attractive — particularly the capitalistic city — and have, paradoxically, much to do with excess and exuberance, with surplus production, conspicuous consumption and waste.

The content of this paper is an attempt to present a shift of perspective in the way we look at architecture, cities and territory. It is an urge to change the paradigm of urban structures and town planning in the light of evolutionary sciences.

The new alliance between humans and nature proposed by Prigogine and Stengers calls for a new view of human systems and of the relations they establish with the environment[3]. These new relations should pursue sustainability as an aim, as well as defend opportunities for a new hermeneutics of the city which will bring a new language and aesthetics.

We believe that the main problem related to the lack of a proper aesthetic thinking in sustainability is basically an issue of phenomenology and hermeneutics. It is due to a certain reductionist and disciplinary approach to reality which would inevitably simplify its complexity. Therefore in order to avoid being trapped in such a mental framework, we need to look at both sustainability and aesthetics within a specific philosophical and philological framework, the one of Systemic thinking and Complexity theory. Such approach, far from being reductive and simplifying, should offer a new perspective.

Often criticized as the theory of 'out of control' the Complexity theory could be instead the enabler of a new paradigm where both sustainability and aesthetics could acquire a different, more promising agency.

Cover - Urbanism in the Dust of Mining Industry, Kaikai zhou, Mingjie Fan, Nan Yang, Shihong Sun MArch in Urban Design, UDII, BPro, The Bartlett, UCL, 2013/14, RC16

Figure 1 - The An-aesthetic Sustainable City: Bed Zen, London, UK

Figure 2 - The Seductive Un-Sustainable City: Rome, Italy

The issue of sustainability

The problem about Sustainability is in fact fundamentally a problem of ecophenomenology, in other words, of how environmental problems are framed: today, the philosophical question of the relationship of nature and ecology with culture and humankind is almost entirely forgotten, possibly obscured by the reductive urge to solve environmental issues. However, this environmental crisis "existing as it does in the human world of value and significance"[4], is a philosophical crisis at heart.

Sustainability has been emptied of a meaningful identity.

The reasons behind this unfortunate unfolding are attributable mainly to three factors: first, its hyperinflationary use as a container of meanings recognizable as a sort of branding;

second, a sort of nostalgic, low-tech, pseudo-bucolic notion of sustainability; and third, its 'form of consumption', a reductionist approach to the complexity of reality.

Therefore any discourse about sustainability will be invested of new credibility only reducing its applicability, embracing a more active and combatant concept of Ecology and dignifying its human, philosophical, social and aesthetics aspects at the same level of the techno, scientific and ethic ones.

In this light the thoughts of the philosophers Maurice Merleau–Ponty (Rochefort-sur-Mer, 1908 – Paris, 1961), Slavoj Žižek (Ljubljana, 1949) and, ultimately, Felix Guattari (Villeneuve-les-Sablons,1930–Paris,1992) are of particular interest because in their speculations they envision an ecological anti-dialectic perspective on Nature and Humankind which is fundamental to overhaul the phenomenological problem of Sustainability.

From Merleau-Ponty's thought two positions are particularly interesting: the rejection of dualism between nature and humankind, and therefore his ecological anti-dialectic perspective on Nature, and his concept of Artificiality as a component of Nature, as its evolution and transfiguration.

The thinking and reflections of Slavoj Žižek on this line are even more radical.

The ideas of the romantic return to a harmonious, organic and balanced Mother Nature and that we have to somehow 'dilute' our human dimension in the presence of Nature carry the power and the inconvenience of blasphemy: the desire for an even more abstract Artificiality where ecology must be active and bold.

Last but not least: Felix Guattari. He condemns the praxes of regarding 'action on the psyche, the socius, and the environment as separate' and declares the urgent need to rather apprehend the world through the interchangeable lenses of these three ecologies', governed by the logic of intensities - the eco-logic - of EVOLUTIVE PROCESSES.

For Guattari this is possible only if we incorporate Subjectivity in the pursue of any regeneration process. And for Subjectivity we mean both a form of knowledge and a tool for aesthetic creation.

Aesthetics

Having reframed the issue of Sustainability, let's turn now to Aesthetics.

Dealing with Aesthetics today means to face from a philosophical as much as scientific point of view the subversion of the 20th century Kantian aesthetic theory which saw the supremacy of thought over emotions and sensations. This is in fact no longer true.

The power of aesthetics lies de facto in its complex agency which is at the same time articulated, relational, informal, adaptive, as much as neurobiologically connoted.

Since a while now studies and researches coming from different disciplines are backing up this position.

Reconnecting to Guattari for example, we need to acknowledge that his triple ecology had overcome the dichotomy between ethic and aesthetics, declaring aesthetics as an ethic according to the transversal aspect of the three ecologies and the 'aesthetic paradigm always relating to modes of existence and life'.[5]

Or lets' just think to the field of Evolutionary Aesthetics which has showed

Figure 3 - The creation of complexity through organization: the living bridges of Cherrapunji, India

us aesthetics as an adaptive system, since it is a major component of how humans solve problems and how they know about and adapt to the world.

On another level, at the end of the 'age of the machines' and the really beginning of the 'digital era', the philosopher and polymath Polanyi, arguing about the importance of the 'Tacit knowledge' in any process directed to the acquisition of knowledge, demonstrated that, aesthetics, as part of this informal knowledge, are determinants to the success of any formal or codified process of knowledge[6].

In the art world, the entire movement of Relational Aesthetics, where value is identified as relational power, has been promoting aesthetics as social interstice producing intersubjective encounters.

And finally exploring the new discoveries in neuroscience we learn that the concept of intersubjectivity promoted by Relational Art is actually neurobiologically connoted, in the 'embodied simulation theory', as intercorporeity. Intercorporeity de facto identifies the neural basis of the aesthetics experience and demonstrates that aesthetics is a form of knowledge that happens in a precognitive phase. In other words firstly we empathize emotionally and physiologically with what surrounds us, and only at a later time we understand it consciously.

This is the end of the Kantian ontology of aesthetics and it is the scientific confirmation of Guattari's position: subjectivity, now specifically defined as Intersubjectivity or Intercorporeity, is a form of knowledge and a tool for aesthetic creation.

The concept of transdiciplinarity and the migration of knowledge

Now that we have somehow tried to reassess the ontological issue of the problem we need to re-examine its hermeneutics because, as Kuhn said, 'when divergences between theory and reality are too big, we need to revaluate the hermeneutics'.

The key to such a challenge resides within the concept of Transdisciplinarity which is a form of metaphysical and mental infrastructure applied in the search of a new praxis.

Transdisciplinarity is about transgressing boundaries[7] and considering reality as a continuous spectrum rather than isolated domains[8].

Moreover, the discourse about transdisciplinarity exposes also another interesting concept in terms of forging a new hermeneutics: the passage from the mechanical era of design to the digital era of organization in search of a meta-language which would allow to properly addressing models and techniques migrating from other disciplines and codes.

'Organization implies no crystallisation, no final results, but, because of its intrinsic impossibility is an engine'[9].

The fact that in the digital era of the complexity sciences, architecture's main scope has been reframed as an organizational one allows for the opportunity to expand the configuration of its models, borrowing and hybridizing from other disciplines, remaining 'disciplined' but not 'disciplinary'. This is a major shift in the research of new models and tools capable to offer a fresh perspective not only in terms of sustainability and

Figure 4 - Hyperhabitat. Reprogramming the world, Guallart Architects, IAAC, MIT The centre for Bits and Atoms, Bestiario

aesthetics, but also towards our whole discipline.

But then, why, one could ask, models are so important within the concept of the Aesthetics of Sustainability?

First, models have been, in general, very important and have become even more important since the 1960s and particularly in the digital era. The word 'model' has substituted for the term 'theory' across all disciplines[10] just as 'simulation' has replaced 'analysis' in many sciences. But models are also not 'just' theories, they are also mediators between theories and reality, between the past and the future. They have a central role in how we bridge the gap between the two domains.[11]

Getting more specific, the concept of sustainability is intimately bound up with maintaining some kind of desirable state into the long-term future. But in complex systems, the goal-posts are always moving: what might seem sustainable today might not be in the future. This is a problem of predictability.

As Mike Batty says, we need to classify models and tools which assume predictability of different kinds. In fact, once a model is defined, we have a device for making predictions. In doing so, we need to develop more pluralistic styles of modelling, planning and negotiating which will be relevant to collaborative strategies. Consequently, each one of these models will bring along its own aesthetics and hermeneutics.

Let's try to have a deeper look into some of them.

Cybernetics, for instance.

Kevin Kelly in his prophetic book 'Out of control: the new biology of machines. Social Systems and economic world' trying to describe how future organizations should perform in order to combine top-down, sequential processes with bottom-up, non-sequential processes, suggested that the best performing apparata would be 'some cyborgian hybrid of part clock, part swarm balancing in the fulfilment of their tasks some control for some adaptability.'[12]

In saying this, Kelly was clearly advocating for the inner capacity of cyborgian systems to negotiate linear and non-linear systems within their realms, which, in the end, is precisely their supreme agency.

The use of Cybernetics models de facto reminds us of a very important function of Architecture and Urbanism: their function as systemic activities rather than just iconic ones.

They are mediums to organize relationships and communication between the three distinct worlds we know, spiritual, physical and digital, engaging a transversal ecological praxis.

In this light Architecture and Urbanism would free themselves from a definition of a 'spatial disciplines' only to acquire a wider transdisciplinary cognitive role.

They would become new models of construction, not only of spaces but of proper cognitive maps.

Allometric and Stigmergic models, developed originally in Biology, have been borrowed by other fields, among which recently urban design, and are used to analyze and evaluate energy flow patterns of natural systems that seek to fill their space in the most efficient manner.

Allometric models study the relationship of body size to shape, anatomy

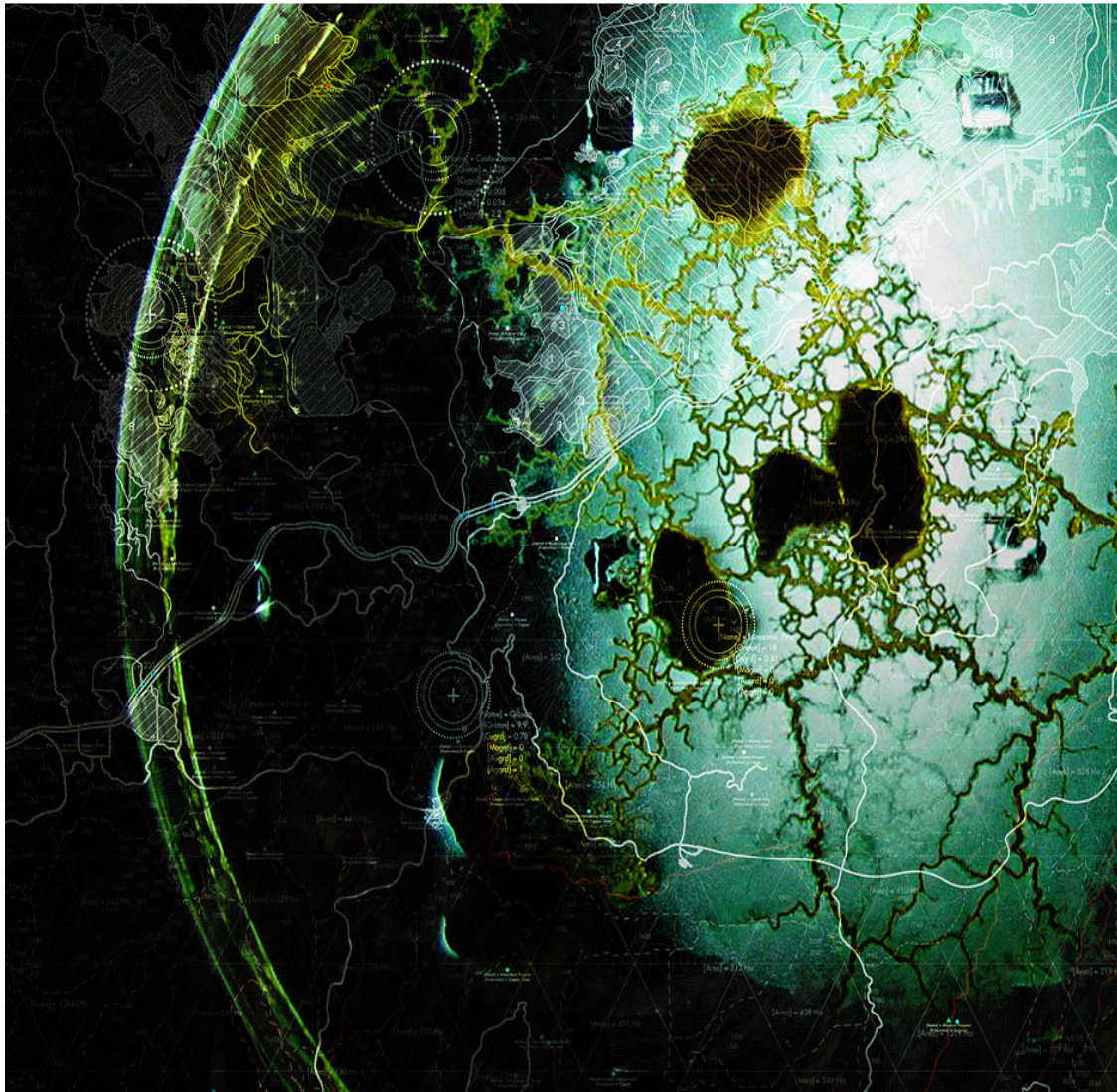


Figure 5 - Urbanism in the Dust of Mining Industry, Kaikai zhou, Mingjie Fan, Nan Yang, Shihong Sun MArch in Urban Design, UDII, BPro, The Bartlett, UCL, 2013/14, RC16

and behaviour, and can be used to link the size and shape of living objects to the networks they use to deliver resources to their parts.

Stigmergic models instead are defined by a series of subsequent actions tending to reinforce and build on each other, leading to the spontaneous emergence of coherent, systematic activity. In specific in stigmergic models the environment acquires a key role, not only as a passive landscape against which all the interactions occur, but rather as a negotiator and a ruler of interactions.

The environment in fact is subject to open interpretation and perception, therefore subject to an aesthetic conventional and collective system of signs and it is a mediator of behaviours, articulated and composed of artefacts which represent the rationality/intentionality of agents' actions. [13]

This concept is of particular interest in the field of architecture and urban design. As Patrick Schumacher rightly points out, architecture — and urban design even more so — are at the genesis of modes of abstract thinking (where conceptual structures and schema can emerge). It follows that architecture should set up social order and the importance of the role of artefacts should become explicit because 'they are the factors upon which society is built up'.[14]

Another interesting field to explore is the one of Geology.

From geology we could borrow the scaled down physical models of territorial elements that teams of geologists and engineers commonly used from the 1940's to evaluate the behaviour of civil structures and river dynamics.

They were known as proxy models, and they tended to represent either the predicting behaviour of the fluid itself or a study of the movement of the medium where the flow takes place.

However, what is really interesting today in the use of these types of models is the design of the interface linked to its generation and control.

The interface is a design space where the user can remotely take decisions on how to interact in the physical generation of the proxy model and simultaneously understand variables related to the effects that these changes produce in the ecologies within a landscape.

Eventually the ultimate goal of design interfaces is to bring design conversations to new levels through their capacity to allow interaction. We will see how this concept will earn a greater importance in the last chapter of this paper.

Originally conceived as the 'science of the State', as it was the collection and analysis of facts about a country (its economy, land, military, population, and so forth), Statistics was later on applied to diverse fields, not least the world of visual arts and music (consider the statistical or stochastic music invented by Iannis Xenakis) and is yet another operational field to borrow from.

Statistical properties of cities in fact can be looked probabilistically to convert mathematical models into structural patters.

They are a formal way of looking at cities based on the study of the network of space that holds the system together. This is what Space Syntax models and algorithms do for instance.

The Space syntax modelling approach seems to propose a new universal definition of a city as 'a network of linked centres at all scales set into a background network of residential space[15] . According to Hillier this iteration of spatial and functional processes could lead to find a possible 'genetic code' for the cities. [16]

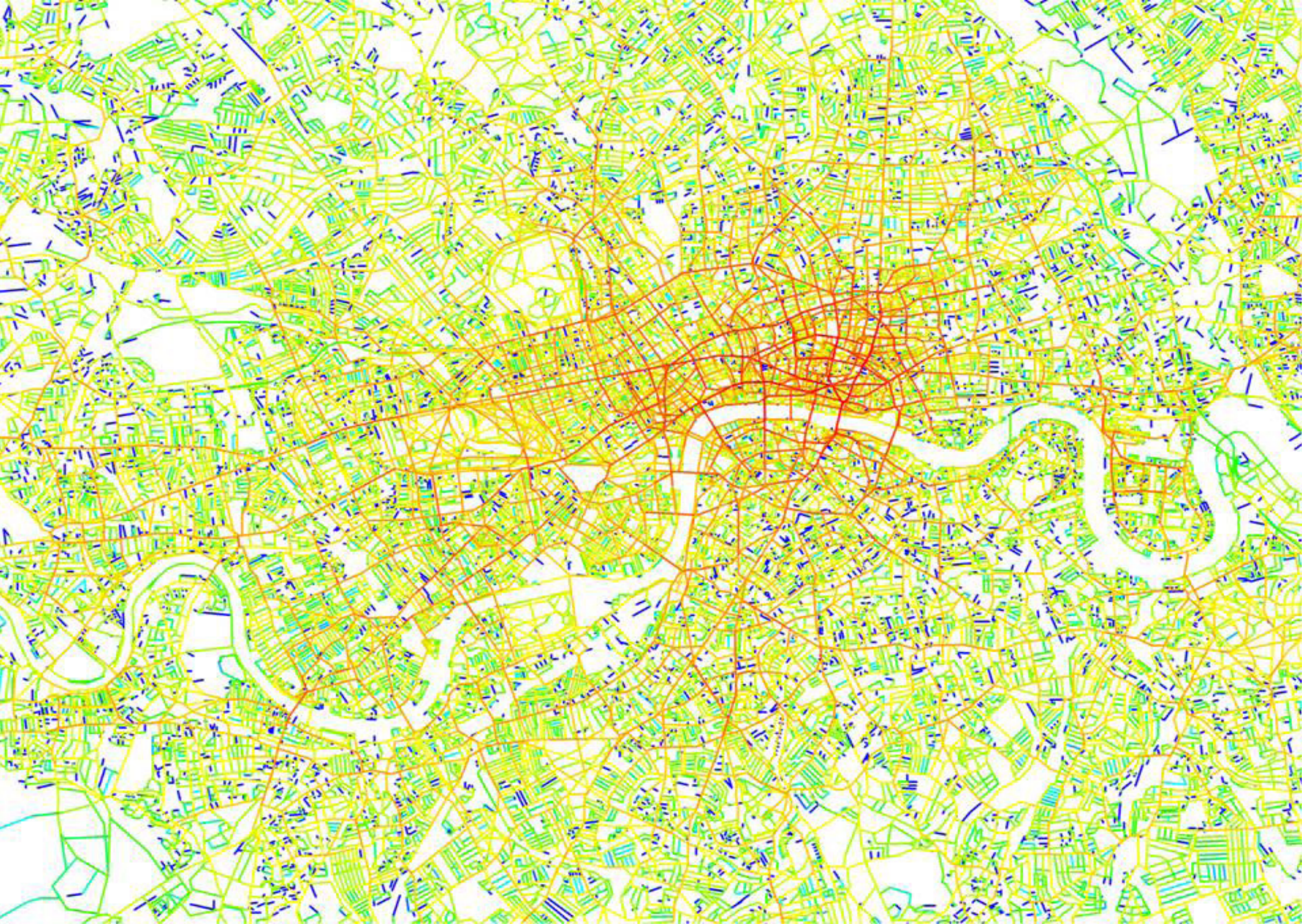
We believe that the great achievement of Space Syntax has been to be able to establish plausible relations between many different processes and therefore to reflect in a quite precise way the commonsense in which we perceive and use cities.

This theory has somehow indexed mental perceptions and as such it has partially decoded an aesthetic knowledge of the city that is the knowledge of the city through perceptions.

The expression 'borrowing from Mathematics' when speaking of architecture and urban design might sound like an oxymoron. Mathematics has always been implicitly and explicitly part of the discipline: geometric rules, static equations, orders of magnitude, rules of proportions, etc., but

Figure 6 - Delta physical simulation and urban proliferation: dealing with tailing ponds of oil mining. Waishan Qiu, Jia Zhang, Guanghui Luo and Sara Chen
MArch in Urban Design, UDII, BPro, The Bartlett, UCL, 2013/14, RC18

Figure 7 - Space Syntax: Prof. Bill Hillier, Prof. Alan Penn, Prof. Laura Vaughan



somehow, it was often soft-pedalling.

But, in fact, 'Mathematics holds the key to simulation of many kinds". [17]

In the last few years it became THE new language to master in order to keep the pace with the contemporary architectural discourse.

It is through mathematics that iconic models, superficially similar to material reality and originally quite separate from mathematics, have merged with symbolic models, representing how function generates form to make digital representations[18].

In urban planning in specific a set of nowhere differentiable equations, fractals, is one of the most interesting examples of mathematical models applied to urban processes. One example for all is the work of Mike Batty and his team at CASA (Centre for Advanced Spatial Analysis at UCL).

In their work fractals become a new form of representation at a fine spatial scale, where units of space are conceived as cells and populations as individual agents.

Within this framework cellular automata highlight rules of development and agent based models focus on how agents respond to attributes of their environment often encoded in cellular landscapes.

Last but not least Computational Sociology and Social Sciences.

Models normally used to understand and anticipate trends and social changes have been applied to describe and understand cities.

Like Sugar-scape models which are social simulations that make possible to explore the connection between the micro-level behaviour of individuals and the macro-level patterns that emerge.

The truly innovative aspect of these models resides in placing the emphasis on the general public as active and as a leading actor and success factor.

In this acceptation of interactions and mixture we could detect one of the fundamental key of the contemporary culture of complexity: not anymore the old notion of quality as an essential, pure identity related to cathartic categories but rather a more diffused and impure one[19].

In other words, in a dynamic system where reality is based on an always mutating tendency, quality is not so much related to pureness, homogeneity, uniformity and refinement but rather to a more complex meaning of sophistication by acceptation, negotiation and exploitation of multiple resonances and superimpositions.

This is an important concept and introduces us to the definition of the Aesthetics of Sustainability.

The science of multiplicities, the authorship question and the notion of the interface [i/f] device

The position about a more complex meaning of quality and value implies a revolutionary approach not just for what concerns the definition of aesthetics but also about the notion of style and authorship. It is an impure aesthetics based on relations of different kinds, where human interactions and social context are more important than individual, private actions.

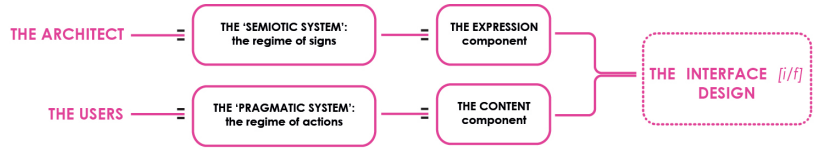
As Carpo says: "self-organizing and emergent systems are playing a major role in challenging the 'modern notion of architect's full authorial control of the end product". [20]

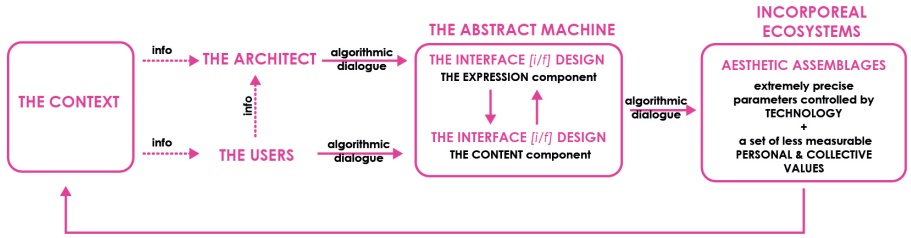
The same notion of complexity, as it has been modelled and applied through the use of Parametric Algorithms (PA) and Interactive Genetic Algorithms (IGA) implies a sort of dialogue, a notational code, between man and machine and between the architect, his authorship and the collectivity.

This dialogue is best described as an interface [i/f] [21], a physical/virtual device enabling communications among entities of different kinds (what Harvey used to call relational domains[22]), each one with its own particular protocol of communication and values. From a semiotic and ontological point of view the interface and its autopoietic, self-organizing assemblages are 'incorporeal ecosystems' de facto resembling the notion of virtual ecology wished for by Guattari.

The very notion of the interface entailing concepts like open-endedness, participation, interaction reminds us that the population, the group, the society is the medium for the production of forms, not the single person, as Alberti used to say.

In this new paradigm, the architect's output is no longer a finite, controllable project but a medium, the interface, which allows a collective choice, and can be seen as a device for 'collaborative rationality'.





The architect with his/her own style and capabilities will maintain complete control on the 'semiotic system' which represents the expression component of the interface assemblage. The 'pragmatic system' instead, representing the content, will have to be directed by the users.

The consequence will be that the architect will have to lose control over the end product which will be informed and activated by the collectivity.

This will be done through an algorithmic dialogue, initiated by the architect, where the final output of the abstract machine will be the result of a mutual feedback between the architect, the users and the context.

Borrowing Guattari's words the Architect will become a cartographer of subjectivity.

The cartographer of subjectivity is the best definition of author:'[...] the ability to compose figures of meaning through the assembly of rather modest fragments of the real, [...] the ability to trace an elegant and precise map of lands of which we know too much and therefore nothing; [...] the skill through which one can merge into a single narrative scattered fragments of real existence that one had long since given up tidying.'[23]

The word subjectivity, is the narrative element, which represents the society's mental and aesthetic ecology, however, the capacity of forming visions of the world belongs to the word cartographer and in this light the interface represents the new concept of Style.

The cartographer is not just a person engaged in the science or practice of making maps. She/he is an artist who owns the gift, the skill and the expertise of ordering, recomposing, choosing, editing, rearranging and cataloguing the world so that we can understand it better, and participate in it fully.

Nowadays, we suffer from overexposure to meaning. We are dazzled, grateful to those who can provide, with lightness and elegance, a form of order, 'to see the lines, to measure distances, to trace perimeters".[24] If we are involved, and contribute to the process, we enjoy it in a deeper, more enduring way.

Aside from the capacity described above, there is another important gift that the cartographer of subjectivity needs to master in order to organize the project: the ability to draw from the "the future to come", l'avenir (as per the definition by Marc Augé[25]) the internal desires and dreams of society. Organizing the project requires capability and talent, as well as considerable sensibility and sensitivity in order to reach for the unknown, the mystery, but yet the desired, the craved, the aspired to, the yearned, the lusted.

He/she must seduce us.

He/she needs to become the ferryman of dreams — must overcome the urgency of the immediate future — in order to lead society to reaching once again the land of 'dreams and revolutions'.[26]

He/she needs to be visionary.

It is, in other words, the capacity to reconnect us to the notion of space and time, our relationship with them that is 'the essential element of the symbolic activity that defines the essence of man and that of humankind.'[27]

He/she certainly does not just map the encountered and the experienced. To be of value, the cartographer of subjectivity must also map the desires and dreams that society projects into the future, as well as include all the big 'anthropologic themes' (Life, Eros, the Sacred, Death, etc.) with their new dramaturgies[28]. But he/she does so while leaving the process open for others to add on to.

He/she sets up the process, creates the organization, instantiates the models and orchestrates the external inputs back into his/her organization (project). But, the final organization is the result of an open process.

This type of process is actually not new, as a matter of fact Umberto Eco in his work 'Opera Aperta' was already debating about it.

He in fact ennobled it asserting that 'the form of the work of art gains its aesthetic validity precisely in proportion to the number of different perspectives from which it can be viewed and understood. These give it a wealth of different resonances and echoes without impairing its original essence'[29]

This view reflects a definition of Aesthetics which is the recognition that part of the aesthetic sensations we experience are coming not just from contemplation but from participation which is as we said previously validated by the contemporary studies in neurosciences and their embodied simulation theory.

As Simondon pointed out: '[...] contemplation is not techno-aesthetics' primary category. It is in usage, in action, that it becomes something orgasmic, a tactile means and motor of stimulation. [...] It is a type of intuition that's perceptive-motoric and sensorial'.[30]

This change of perspective in terms of critical agency would inevitably bring along a change in what Jacque Rancière calls the distribution of the sensible, where sensible means the acceptation of 'perceptible or appreciable by the senses or by the mind', not as the synonym of realistic, reasonable nor prudent or sober.

Hence, the distribution of the sensible consists in new forms of inclusion and exclusion of the collectivity in the process of politic/aesthetic appropriation of reality since access to it (to a different distribution of the sensible) is the political instrument par excellence against monopoly.[31]

The complexity theory could therefore be that enabler of a new paradigm where the notion of single authorship with his aesthetic language is substituted by the concept of a collective and a new Aesthetics of Choice or 'aesthetics of decision'. According to evolutionary theory, aesthetics might then recover its real, fundamental meaning, which was mistaken throughout history as more cultural, intellectual, philosophical and abstract definitions,

losing its very core nature: its essence as an adaptive system and an ecological category[32].

We would then regain that 'flux of participation' evoked by David Abram: 'Our senses are not for detached cognition but for participation, for sharing the metamorphic capacity of things that lure us[33].'

Conclusions

We therefore want to conclude that the Aesthetics of Sustainability is for us not a new aesthetic style.

It is a new aesthetic concept of style and authorship.

It is that action on the psyche, negotiating between personal subjectivity and collective subjectivity, as a form of knowledge, a process, and a tool for aesthetic creation that cannot be separated from the socius and the environment: this is what we mean for the Aesthetics of Sustainability.

Notes & References

1. This article is an adaptation from a chapter in the book: Di Carlo I., 'The Aesthetics of sustainability. Systemic thinking and self –organization in the evolution of cities.', Listlab Ed., July 2016, Trento-Barcelona
2. The first human metabolic system was hunter-gathers society, the second was agricultural society and the third was industrial society.
3. Pulselli R.M & Tiezzi E., Cities out of Chaos. Urban self-organization and Sustainability. WIT Press, Southampton, UK, 2009
4. Merleau-Ponty M., La Natura. Lezioni al College de France 1956-1960, Raffaello Cortina Ed., Milano 1996
5. Guattari F., Op. Cit.
6. For more on this subject please see Polanyi M, the Tacit Dimension, University Of Chicago Press, Reissue edition, 2009
7. Nowotny H., The potential of Transdisciplinarity, available on line @ http://www.helganowotny.eu/downloads/helga_nowotny_b59.pdf
8. Le Ricolais as quoted by Reiser+Umemoto in Atlas of Novel tectonics, NY: Princeton Architectural Press, 2006
9. Najle C., in Organization or design? Architecture symposium held at Harvard GSD, October 2015, available on web @ https://www.youtube.com/watch?v=xRRYDzNg8hA
10. Batty M., Model cities, TPR 78 (2) , 2007
11. Batty M., Op. Cit.
12. Kelly K., quotes extrapolated from his book Out of Control: the new biology of machines, Social Systems andeconomic world, 1994, available on web @ http://kk.org/mt-files/books- mt/ooc-mf.pdf
13. Ricci A. and others, Cognitive Stigmergy: a Framework based on Agents &Artifacts, on line http://www.academia.edu/277398/Cognitive_Stigmergy_Towards_a_Framework_Based_on_Agents_and_Artifacts
14. Schumacher P., Proto_E_cologics Symposium, 2011, on line http://vimeo.com/28816240
15. Hillier B., The Genetic Code for Cities: is it simpler than we think?, in Complexity Theories of Cities have come of age. Springer : Complexity, Berlin, 2012 .
16. Hillier B., Op. Cit. .
17. Batty M., Model cities, TPR 78 (2) , 2007
18. Batty M., Op. Cit.
19. Gausa M. , Open. Espacio Tiempo Información. Arquitecture, Vivienda y ciudad contemporanea. Teoria e Historia de un cambio, Actar, Barcelona, 2010
20. Carpo M., The Alphabet and the Algorithm, Writing Architecture Series, The MIT
21. The interface [i/f], as indicated with the symbol [i/f], is a term coined by the author. It refers specifically to the type of interface described in this paper The [i/f] symbol specifically indicates a type of interface which allows interaction and collective choice.
22. Harvey D. Justice, Nature and the Geography of Difference, Wiley-Blackwell, Oxford, 1996
23. Baricco A., Con i miei occhi, article published in La Domenica di Repubblica, number 539, 5 July 2015, pag. 26
24. Baricco A., Op. Cit.
25. Augé M., Futuro, Bollati Boringhieri, 2012
26. Augé M., Futuro, Bollati Boringhieri, 2012
27. Augé M., Op. Cit.
28. Branzi A., as written in the papers of the installation 'Anime' exhibited at la Fondazione VOLUME!, Rome, 23 rd January -4 th March 2016
29. Eco U., The Open work, Harvard University Press, Cambridge Massachusetts,1989
30. Simondon G., Op.cit., Issue 12, Paris, 1989
31. Rancière J., The Politics of Aesthetics, Continuum, MPG Books, Cornwall, UK, 2004
32. Di Carlo I., The aesthetics in the definition of sustainability, Cities in Nature. Eco-urbanism Landscape Architecture,ed. Scaglione Pino, List Lab, Trento, pp 87-94, 2012
33. Abram D., as quoted in Reclaiming Animism, Stengers I., on line http://www.e-flux.com/journal/reclaiming- animism/

IAAC BIT 7
September 2016

IAAC BITS

IAAC BIT FIELDS:
1. Theory for Advanced Knowledge
2. Advanced Cities and Territories
3. Advanced Architecture
4. Digital Design and Fabrication
5. Interactive Societies and Technologies
6. Self-Sufficient Lands

IAAC

PUBLISHED BY:
Institute for Advanced Architecture of Catalonia

ISSN 2339 - 8647

CONTACT COMMUNICATIONS & PUBLICATIONS OFFICE:
communication@iaac.net

Iaac

Institut for Advanced Architecture of Catalonia
Barcelona

Pujades 102
08005 Barcelona, Spain
T +34 933 209 520
F +34 933 004 333
www.iaac.net